Urban Development Platforms, Knowledge Cities, and Sustainable Development: The Political Economy of Urban Commons in the Context of Climate Change

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Plateformes de développement urbain, villes de la connaissance et développement durable: L'économie politique des biens communs urbains dans le contexte du changement climatique

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Abstract in English

The thesis explores urban commons as economic tools for communities in cities to advance climate change mitigation and adaptation. What interests us here most are the processes taking place within the governance of urban commons which allow them to become viable and oriented towards climate change mitigation and adaptation policies. Those processes are deeply rooted in various commoning practices which provide communities with needed empowerment mechanisms. My analysis aims to shed light on what urban communities can do from the ground up to help cities achieve the ecological transition. This thesis is divided into two parts. Part 1 (chapters 1 and 2) involve the theoretical portions of my thesis while part 2 (chapters 3, 4, and 5) represent my research and contributions.

After tracing, with the help of an extensive literature review, the origins of commons as a shared resource with a governance rendering it sustainable (Chapter 1), I analyze how commons have recently moved into cities in a variety of ways. Of particular interest here (Chapter 2) is urban commons as providers of various ecosystem services for and by neighborhoods, communally organized beyond the profit motive. In this context, I can link urban commons also to the broader "Social Solidarity Economy," as crystallized in successful commons-cooperative alliances. The chapter ends with a typology of urban commons.

I then discuss methodological aspects of the thesis (Chapter 3), based on identifying and analyzing peer-produced open-source urban commons (PPOSUCs), which involve open source online platforms and a large network of urban commons. My work there has focused on analyzing tactical charters, and my detailed discourse analysis of these common-defining documents presents us with valuable lessons in how successful urban commons defined their mission, set up their governance mechanisms, organized members in neighborhood settings, and obtained the backing of local authorities. Three case studies, analyzed in great detail as distinctly different urban commons projects (Chapter 4), confirm the importance of tactical charters and other commoning activities I highlighted earlier as drivers of urban commons success. A transversal discussion (in the concluding chapter 5) of their successes, failures, and different outcomes shows that urban

commons, when given the right legal and economic means, can become an essential, scalable, low-cost tool for the ecological transition in cities.

The thesis concludes that urban commons can be viable institutions cities need to manage a future shaped by accelerating climate change pressures. Urban commons can empower communities and provide them resources they can use to pave their own path towards climate resilience within their neighborhood and for the whole city.

Abstract en Français

Cette thèse explore les communs urbains comme outils économiques permettant aux communautés urbaines de renforcer la lutte contre le changement climatique ainsi que d'améliorer l'adaptation à ce dernier. En particulier, nous nous intéressons aux processus de gouvernance qui permettent de viabiliser et d'aligner politiquement les communs urbains. Ces processus sont profondément ancrés dans diverses pratiques de « commoning » qui équipent les communautés des mécanismes d'autonomisation nécessaires. Notre analyse vise à mettre en lumière ce que les communautés urbaines peuvent faire pour aider les villes à réaliser la transition écologique. Cette thèse est divisée en deux parties. La première partie est composée des chapitres 1 et 2 et représentent les parties théoriques de notre travail. Les chapitres 3, 4 et 5 sont regroupés dans la partie 2 et contiennent le résultat de nos recherches et de nos contributions.

Après avoir retracé, à l'aide d'une vaste revue de la littérature, les origines des communs en tant que ressources partagées basées sur une mode de gouvernance qui les rend durables (chapitre 1), j'analyse les diverses façons dont les communs se sont récemment installés dans les villes. Un intérêt particulier est porté ici (chapitre 2) aux communs urbains en tant que fournisseurs de divers services écosystémiques pour et par les quartiers, organisés communautairement au-delà de la recherche du profit. Dans ce contexte, nous pouvons également relier les communs urbains à l'économie sociale et solidaire au sens large, telle qu'elle se s'exerce dans des alliances communs-coopératives réussies. Le chapitre se termine par une typologie des communs urbains.

Nous discutons ensuite des aspects méthodologiques de notre travail (chapitre 3), en identifiant et analysant des communs urbains « open source » produits par des « peers » (PPOSUC), comme

nous sommes parvenu à le faire avec des plateformes numériques et des réseaux des communs. Notre travail s'est concentré sur l'analyse des chartes tactiques, et notre analyse détaillée du discours de ces documents nous offre des leçons précieuses sur la façon dont les communs urbains ont défini leur mission, mis en place leurs mécanismes de gouvernance, organisé les membres dans les quartiers et obtenu le soutien des autorités locales. Trois études de cas, analysées en détail (chapitre 4) en qualité de projets de communs urbains distincts, confirment l'importance des chartes tactiques et des autres activités de « commoning » que nous avons mis en évidence précédemment en tant que moteurs du succès des communs urbains. Une discussion transversale (chapitre 5, conclusif) sur leurs succès, leurs échecs et leurs différents résultats souligne que les communs urbains peuvent devenir un outil essentiel, évolutif et peu coûteux pour la transition écologique dans les villes, à condition de leur accorder les moyens juridiques et économiques suffisants.

La thèse conclut que les communs urbains peuvent être des institutions viables dont les villes ont besoin pour gérer un avenir façonné par les pressions accélérées du changement climatique. Les communs urbains peuvent donner du pouvoir aux communautés et leur fournir des ressources qu'elles peuvent utiliser pour tracer leur propre chemin vers la résilience climatique au sein de leur propre quartier et pour l'ensemble de la ville.

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Introduction - Cities in Crises, Commons as a Viable Option

This thesis is about urban commons and their viability as an organizational model for addressing key challenges which cities will face in coming decades all over the globe. The early 21st century is a time marked by two driving forces that may cause serious, potentially even catastrophic pressures for cities in the near future. The first driving force is the rapid urbanization as a growing portion of the world's population looks for job opportunities and a more dynamic lifestyle in urban settings. This has already led to overpopulation in many countries and, tied to it, the overexploitation of natural resources. Once fewer resources are available for use, urban residents are bound to suffer degradation of their living conditions. Playing out against this already troubling demographic setting is the relentless reality of intensifying climate change, which leaves high-density areas exposed to natural disasters capable of causing enormous damage and casualties in the wake of increasingly frequent and devastating "extreme weather" events. I could see this trend materialize first hand, living through New York City's Hurricane Sandy in October 2012. More gradual environmental degradation associated with climate change, such as rising sea levels, pollution, drought-related pressures on local water and energy supplies, traffic congestion, or weather-related stress on the infrastructure (as we have already witnessed in many US cities during winters with the Polar Vortex), adds to the challenges cities will face to cope with changing weather patterns (Rehmeyer 2010). There is a need for cities to prepare for climate chance resiliency and mitigation, later on also adaptation when the climate crisis will have hit cities as a lasting set of constraints and sources of damage.

0.1 Urbanization and Climate Change

Rapid urbanization is an increasingly prevalent phenomenon. The United Nation's 2018 Revision of World Urbanization Prospects (United Nations 2019) illustrates that over half of the world's population lives already in densely populated urban settings, with another 2.5 billion people likely to join them by 2050 above all in Asia and Africa. This trend is like a double-edged sword, because ever-increasing numbers of city dwellers only exacerbate the problem of pollution within urban contexts. Yet at the same time those cities are more and more deprived of green spaces capable of

capturing or isolating that pollution, as they find themselves subject to ever growing population densities. Data from the UN Habitat (United Nations, 2020) stipulates that cities contribute already heavily to climate change by using up 78% of the world's energy and emitting 60% of the world's greenhouse gas emissions, while taking up less than 2% of the Earth's surface. Yet at the same time cities are also very exposed to the existential threat of climate change. Over 90% of all urban agglomerations are in coastal areas. According to the U.S. Department of Commerce's National Ocean Service (see Lindsey 2021), ocean levels are rising more rapidly than ever, at a rate of more than an eighth of an inch per year. That means that global sea levels were on average 3.4 inches (8.76 centimeters) higher in 2019 than in 1993. Not surprisingly, cities are experiencing 600% more frequent flooding incidents from causes like storm surge. We also have to take into account the immense physical and financial damage of these trends on cities, as dramatically illustrated by the destruction of much of New Orleans in the wake of the Hurricane Katrina in 2015.

People across the world will have to face the increasingly urgent challenge of climate change mitigation and adaptation head on. This task has proven to be very challenging, not least because our economic system, besides being built on fossil fuels as key energy sources, encourages relentless and fast-paced expansion. Public opinion may have become increasingly aware of the dangers of climate change, but a majority of people in rich countries are still reluctant to make sacrifices for dealing with this deepening crisis (such as accepting higher electricity prices). Businesses in polluting sectors, such as fossil-fuel-based energy companies, have a lot of vested productive assets which risk becoming stranded and obsolete, leaving those firms inclined to resist addressing the issue of emissions reductions. Market and profit incentives are set against accepting short-term pain for long-term gain. Private for-profit business actors are not inclined to address climate change fundamentally unless driven by a very different set of incentives. We live after all in a shareholder-dominated economy, catering primarily to a small but powerful community of investors legally claiming ownership to the majority of equity shares in a nation's leading companies (Lazonick & O'Sullivan 2000). This power gives shareholders leverage to decide which operations a company commits to without having to consult or negotiate with other implicated economic actors. If that company commits a violation negatively impacting surrounding areas, shareholders will almost always choose inaction precisely because they are never held accountable for their actions. Non-accountability means that companies do not have to face the consequences

of their actions when they negatively impact a community, leaving the affected communities powerless and anguished. Business managers respond to shareholders, but ignore other stakeholders. Such behavior is common in our profit-driven economy, where corporations committed to shareholder value maximization act in their own narrow self-interest. Shareholder pressure for maintaining high quarterly earnings and dividends at all times makes it very difficult, if not impossible, for corporate executives to plan for the long run, which is necessary for the preservation and gradual exploitation of any finite resource. Their own pay structure, with excessive emphasis on stock options and performance-based bonuses rewarding short-term profitability, makes them also highly reluctant to initiate structural changes which, even though necessary and beneficial for the long run, hurt the bottom line in the short run.

Nor is government necessarily in a strong position to address climate change. This global phenomenon obviously requires worldwide coordination. While we now have a global governance structure in place thanks to the Paris Climate Accord of 2015, it is entirely dependent on voluntary contributions from countries and lacks any enforcement mechanism other than moral suasion. Well-intentioned governments, with more committed leaders, may wonder why they should make painful changes, often resisted by large swaths of their own electorate, when so many other countries are not doing their fair share. When it comes to cities, there is always the tricky question in nearly every country how central governments, provincial governments, and local governments interact, who has the power to do this or that, and how the different levels of the government share costs and revenues. In most countries the national government pays much attention, and distributes resources disproportionately, to one or two politically or commercially dominant urban centers, leaving other cities more exposed to fending for themselves. Local governments, even when they are not corrupt, not too beholden to powerful commercial interests, adequately staffed, or administratively competent (all big if's), often lack resources, expertise, and cross-departmental cooperation to address climate change mitigation or adaptation effectively. And then there is also a problem of political representation. Far too many municipal governments in the world are subject to regulatory capture, dominated by local commercial interests in favor of building up areas in a nexus of environmentally damaging activities. Therefore they are not inclined to give voice to the sustainability concerns of local communities. Irrespective of these limitations, it is increasingly

obvious that the battle against climate change is going to get won or lost in the cities (Bloomberg 2015; Hoeflich de Duque 2019).

In recent years the world has already begun to get a sense of the profound stressors climate change will inflict upon the environment of which we humans are integral part, whether propelled by unprecedented heat waves, polar-vortex cold spells paralyzing the infrastructure, month-long wild fires out of control nearby, heavy storms, extreme rainfall events causing deadly flash floods, or long draughts. We are already getting a frightening sense of the potential for catastrophe, even though the actual degree of global warming, currently estimated at 1.1ºC above pre-industrial (i.e. circa 1850-) level, is still only a fraction of what the heating-up might be by mid-century if current trends continue unabated. This is especially true for cities, densely populated areas whose (spatially, temporally, an financially) constrained and tightly packed inhabitants are particularly dependent on the smooth functioning of the urban infrastructure.

Cities are the primary emitters of greenhouse gas emissions, and so they will also have to be key sources of addressing the problem. In the face of a growing systemic threat engulfing the entire planet in possibly irreversible fashion, we need to do everything now to avoid the worst. The world community of nations and their governments are about to embark on a zero-carbon transition. This is not just a technical question of undoing our fossil-fuel-based economic structure and replace it with one grounded in renewable energy and environmentally friendly products. The transition we face is perhaps even more so a socio-economic, and ultimately political, question of how to make our society, and whatever mixed-economy model we think should underpin it going forward, best fit for sustainable development. The key question, for cities and beyond, is how do we best govern ourselves and our relationship to needed resources in the direction of a more ecologically grounded capitalism. We have to figure out, with mounting urgency, what such a systemic reform entails. Ironically, the global pandemic of 2020 – 2022, with its dramatic impact on cities all over the world, has given us a trial run for how to face an open-ended situation of extreme uncertainty, resource stress, infrastructure disruptions, social-political instability, economic crisis, and experimentation on a massive scale.

Already the pandemic has illustrated how cities and their residents may be forced to face sudden and massive change in relation to their environment. Lockdowns forced total closure of spaces, suspension of daily routine activities, and social isolation from each other, followed by new interaction, access, and transaction rules to create a new « normal. » Public spaces had to be reconfigured, whether in overcrowded hospitals and community health centers, outdoor facilities for restaurants, or commercial buildings. Service- (and hence human-interaction-) based tasks moved online, a shift in the social organization of work likely to persist in various hybrid configurations. Office buildings, once packed with workers commuting from all over to work every day, may end up being used much less. Many of those can be re-zoned for other purposes, but by whom, how, and for what remain questions yet to be addressed as an issue involving potentially a great variety of stake-holders.

Climate change involves transformational change in cities on a much greater scale, whether we are talking about installation and distribution of renewable energy, smart electricity grids, new public-transportation facilities, cooperative affordable-housing arrangements, well-insulated buildings configured together for a variety of sustainability-enhancing microclimates, the greening of buildings and other built-up areas, tree planting campaigns, community gardens, urban farms, recycling and waste management facilities driving the needed transition to a « circular » economy (moving from our current « take, make, waste » model of for-profit production to one minimizing waste and pollution, keeping products and materials in use longer, and regenerating natural systems). The challenges here go seemingly beyond the traditional juxtaposition of private versus public spheres (e.g. private goods versus public goods) and the much discussed market-versus-state dichotomy. They touch instead on the question of community engagement and, with it, the question of urban commons. My thesis intends to make a useful contribution to the commons literature by exploring how different kinds of urban commons can help cities cope with the challenges of climate change mitigation and adaptation.

0.2 Urban Commons as Engines for Change

The phenomenon of urban commons is a relatively recent one, becoming an object of debate over the last decade. Renowned urbanist Sheila Foster (2020) stresses the need for organizing much of

our « urban infrastructure as a "commons" capable of meeting the social and economic needs of the most vulnerable urban populations. She says that "[T]hinking of the city as a commons recognizes as legitimate, even innovative, the collective action of urban actors who utilize land and other infrastructure to construct informal settlements, community gardens, urban farms, mesh wireless networks, new limited-equity housing and commercial spaces that are then collaboratively stewarded by an identified community or group of people." There are two very interesting notions introduced here. One is the idea of organizing infrastructure, presumably meant here in a broad sense as public goods or common goods, as commons for whom this kind of collaborative management may be an appropriate solution in light of their non-excludability or their non-rivalrous consumption. Commons management is meant here explicitly to engage vulnerable urban populations likely to be marginalized by the other dominant structures of resource control, the for-profit market regulation of private owners exercising property rights rooted in exclusion and discrimination or the administrative state power exercised in top-down fashion. Engaging these otherwise marginalized communities involves collaborative governance. The other notion of interest is the idea of the city itself being a commons, evoking a sphere of community-based social organization of resource management enriching the lives and improving the social welfare of urban residents committed to collective action (Foster and Iaione 2016).

While we have a growing variety of urban commons taking root in many different places, a trend bound to evolve quite a bit further in the face of climate-change mitigation and adaptation challenges faced by overstretched cities all over the globe, we have yet to anchor this category better theoretically. My thesis is an effort to help that task along. The challenge here is that urban commons go beyond evolving conceptions of commons and thus need to find their own space in the commons literature, possibly bridging its two principal theoretical strands in what might ultimately imply a meaningful synthesis. Such integration might be especially useful and timely when considering the potential of broadly conceived applications of commons, notably urban commons, for helping transform modern-day capitalism into a socially better balanced and more environmentally oriented economic system prioritizing sustainable development in the age of climate change. Yochai Benkler (2013) refers in this context to commons-based management of key resources being distinguished by its provision of regulated access to a broad group of users on non-discriminatory terms. In comparison to property-based management, such shared and

collaboratively managed access to critical resources, such as highways, electricity, information, or internet, encourages low-cost experimentation, learning, and adaptation in the face of continuous changes, all qualities promising to be useful in our ongoing societal reorganization towards a low- or even zero-carbon economy.

We can already see that urban commons get their legitimation from organizing social relations of their producers and users towards the resource in question to assure its sustainable reproduction. This is precisely what commons are supposed to do, in contradistinction to mere common-pool resources. The latter involves natural resources used and exploited by a host of different users. Such common-pool resource may not be manageable in sustainable fashion, if there is no way of instituting rules and regulations for their use. Think, for example, of a lake used by several individual fishermen. It may be impossible to impose a commercial price for access rights which is presumably why the resource in question, the lake, is a common-pool resource. But this inability to impose a price on access implies a demand-side market failure. Fishermen, who are free to access the lake whenever without any regulatory constraint, will fish as much as possible to maximize their individual profit, which means the lake can easily have its fish depleted by such profit-driven behavior. That is where Garrett Hardin's (1968) "tragedy of the commons" idea comes from. To the extent that it is not governable and hence subject to overexploitation or overuse, any common-pool resource may eventually face degradation and destruction.

It is in the face of this possibly widespread phenomenon of environmental degradation that the Elinor Ostrom (1990) characterized her conclusions from several field studies where users of common-pool resources got together in collective-action schemes to manage resource access in collaborative fashion so that the resource could sustain itself over time. Ostrom (1992) identified eight so-called "design principles" for common-pool resources to be managed collaboratively as commons. Her life-long research and field studies involved small-scale projects of different kinds of commons where local knowledge by commoners played an important role in facilitating an alternative access-regulation regime beyond the typical (and frequently incomplete) choice between market-regulated exclusion rooted in private property or state-imposed regulation of (i.e. non-excludable, non-rivalrous) public goods. A lot of the collective action mobilizing the governance of such commons, as limited common-property regimes, focuses on addressing

congestion problems threatening the functioning of the resource. Towards the end of her life, during her last decade of research in the 2000s, Ostrom collaborated with others, notably Charlotte Hess (see Hess and Ostrom, 2008), to expand the theoretical scope of commons and extend their applicability towards non-excludable public or common goods such as knowledge, information, and libraries.

Ostrom's late-career extension occurred just when a second track of commons research opened up. As well explained by Benkler (2013), its protagonists were legal scholars (e.g. James Boyle, Mark Lemley) focusing on intellectual property rights, the dissemination of knowledge, and the nature of information in the public domain. Benkler himself stressed in this regard the growing pervasiveness of commons in our modern, highly networked information economy. Of crucial importance here are positive network externalities, rendering a network more valuable for its members when its scope is allowed to expand, which outweigh any private profits from its commercial exploitation via asymmetries in access rights to information. Under such conditions, as prevail for instance on the internet, we have so-called "open commons" which offer symmetric access and use privileges for an open class of potential users. Brett Frischmann (2012) has made an important contribution to broaden the "open commons" concept to a wider range of so-called "infrastructure" goods, following a reconceptualization of what we mean by infrastructure today. This is where cities enter the picture as commons, comprising concrete examples of urban commons aimed at connecting marginalized local communities to much needed resources in their neighborhood which they themselves may provide more effectively through collective-action governance than relying on markets or the state.

Much of what happens in cities with so-called open commons applies to urban common-pool resources which contain most of the elements of the CPR, except that they involve a top-down governing body, usually the city government, that sets up rules and regulations of use. Urban CPRs, such as sidewalks and public squares, are fully open. This means that they are in principle non-excludable so that anyone can use them and exploit them to their advantage, as long as doing so in compliance with certain government-enforced rules of access and use which must be followed to avoid fines and other sanctions (e.g. traffic rules). Sidewalks, sewers, infrastructure, or transportation are all examples of this. The governing rules of urban CPRs do not necessarily

stop new innovations or changing human behavior from disrupting the flow and use of these urban CPRs, precisely because of their openness. A case in point arose a few years ago when electric scooters were introduced to the market, thanks to the institutional fabric of sidewalks (an urban CPR). As people were buying those electric scooters, rules and regulations for urban CPRs were not yet adapted to this new innovation. So, people were scootering on sidewalks and causing accidents that harmed people and property. Eventually, rules were set out to prevent scooters from going onto the sidewalk. But the effectiveness of such regulation remains in question due to the open CPR remaining somewhat ungovernable even with these city regulations in place.

We need to distinguish urban commons from urban common-pool resources, much in the same way that Elinor Ostrom did when she distinguished commons from CPRs in response to Garett Hardin's "Tragedy of the Commons" dystopia. In that regard, we can look at urban commons as spaces which may have fallen under the original urban CPR definition, were it not for communities coming up with humanly created rules for access, maintenance, and preservation to ensure their sustainability. Much like Ostrom's design principles, these collectively elaborated rules and principles render urban CPRs into urban commons to support the community's well-being. Aimed at avoiding overexploitation, the rules may contain a certain level of exclusion aimed at those who do not comply while also providing for the needs of the community. The rules are not anymore top down, but created as a bottom-up approach by the community who knows the resource the best and wants to control its use. The people creating these humanly-designed rules have the objective of depending on that resource over the long haul.

Because of their capacity to aggregate activists and citizens in an organized and democratic fashion towards a shared objective, commons have enormous potential to have an impact on how we treat climate change in the future. But to understand the congruence between commons and climate change, the theory of commons needs to be further explored and then linked to cities, urban policy, and urban governance structures which implicate citizens, including the most marginalized populations. Urban commons involve spaces and structures that are based on communal property ownership, engage a multitude of stakeholders, and provide a base for institutional arrangements procured by communities. Such urban commons can serve as spaces of cultural diversity, innovation, and production of needed resources aimed at improving the lives of city dwellers. The

initiation of urban commons allows people to develop knowledge about the local bioregion, learn how to manage spaces through collective action, and acquire the means to produce certain byproducts that can capture carbon or provide additional resources for climate change resiliency.

My thesis aims to demonstrate how urban commons can be one of the key tools cities might use to prepare residents more effectively against climate change, specifically by increasing the resilience of local neighborhoods. They provide a vector of societal (re-)organization so that we no longer have to depend solely on markets or the state apparatus to resolve the climate change crisis. The nature of urban commons permits engaging especially marginalized communities in cities to contribute to ecological initiatives, something that neither markets nor states have been able to do well at this point. Right now, socio-economically disadvantaged communities in particular lack the tools needed to address ecological problems within cities. For marginalized communities, often victimized by environmental discrimination hitting their neighborhoods far harder than wealthy neighborhoods, to become better equipped, I argue in my thesis in favor of increased support for urban commons and enabling these commons to have their space in 'harmony' with municipalities and markets (the two dominant forms of governance in cities), while still autonomously run by engaged members of the communities they serve. My case in favor of urban commons as enablers rests on the following arguments:

1. Societal well-being rests not least on the availability of public goods, such as access to clean air and water or security, as well as common goods, such as exhaustible natural resources. The latter risks exhaustion unless regulated. For many common goods it is best to manage them as commons to avoid their overuse and degradation, since they are rivalrous yet at the same time non-excludable. But climate change also threatens to turn many public goods into common goods, as its impact undermines them in quantity and quality. This is especially true in densely populated and land-scarce urban settings, propelling urban commons to strategic importance.

2. Commons governance empowers communities by putting them at the center of resource management, decision-making, and distribution of roles and responsibilities related to the resources managed as commons.

3. Urban commons should get embedded in a deepening of participatory democracy around the principles of horizontal subsidiarity according to which all levels of government cooperate and share power with associated citizens in collective pursuit of the public good and the general interest. Hopefully, implementing such base democracy becomes part of a broader societal transformation in favor of a more solidaric society and sustainable environment.

4. Commons can produce specific tools and develop resources that are much more sustainable and ecologically responsible than markets and consumption --- particularly when it comes to energy consumption, food production, recycling, waste management, and producing resources that are consumed where they are produced (which is more efficient and ecologically viable than standard capitalist practices of production and distribution).

5. Local production and consumption of these basic resources means that communities can sway away from ecologically damaging market structures and actors, such as agribusiness.

6. Commons make cities more eco-friendly by producing a variety of ecosystem services as well.

7. Commons encourage communities to become more resilient to potential climate change disasters by allowing them to co-create their own resources which they would otherwise lack. In that sense, urban commons often emphasize creation of new resources rather than collective management of already existing common-pool resources, a reality with significant implications for the social organization underpinning such commons and even the evolution of the theory of the commons.

8. One such implication of creating entirely new resources as commons is the important role assumed by "commoning" as the social process allowing new common pool resources to be created.

0.3 Methodology

To the extent that urban commons are built from the ground up by different communities through processes of experimentation, it is impossible to analyze them at a level of abstraction conducive

to quantitative theory or statistical data. Instead we have to analyze urban commons from within, as evolving social processes and institutional structures aimed at common-pool resources or common goods, whether naturally there or created by human effort, to manage them responsibly and sustainably. How do you study such a complex socio-economic and political phenomenon?

Research on commons has to respect their highly individuated and specific nature while at the same identify generalized features shared between them to serve as building blocks advancing the theory of (urban) commons. At the center of research on commons have typically been scholar-activists, from Elinor Ostrom in the 1990s to Sheila Foster or Christian Iaione in the 2010s. Their work can be best characterized as participatory action research, an approach originating with German-American social psychologist Kurt Lewin in the 1940s (Adelman 1993) and particularly applicable for commons as vectors of social change. More than traditional quantitative research methods, research on commons by scholar-activists involves various qualitative research methods for descriptive data collection, whether in the form of interviews, focus groups, case study research, participant observation, or ethnographic research to analyze how different groups of people live their lives. This sort of participatory action research has been proven to be effective in researching commons, as demonstrated by Elinor Ostrom's inter-disciplinary Workshop in Political Theory and Policy Analysis at Indiana University, the Co-Cities Project of urban commons researchers Sheila Foster and Christian Iaione (2016), or Michel Bauwens' P2P Foundation.

A crucial modern-day dimension of participatory action research is the internet, a transformative force in greatly expanding the use of qualitative research methods. One such internet-based channel advancing participatory-action research on commons are "Free/Libre Open Knowledge" (FLOK) platforms connecting researchers, community leaders, activists, and other commoners and thereby creating a community of information-generating and -sharing participants wanting to exchange ideas and learn from each other's experiences. Those open-source FLOK network platforms can be themselves organized as commons, specifically geared towards urban issues and targeting city dwellers, in which case they become a whole new type of urban commons which we might appropriately characterize as peer-produced open-source urban commons (PPOSUC). Sheila Foster and Christian Iaione's (2016) Co-Cities Project (https://labgov.georgetown.edu/co-

cities_project/) is one such PPOSUC, the C40 City Solutions Platform (https://c40citysolutionsplatform.org) another. I myself have worked on yet a third such PPOSUC, called *Remix the Commons* (remixthecommons.org).

PPOSUC network platforms, such as *Remix*, create a data and knowledge base about (urban) commons while at the same time fostering debate among commoners and their community about the key challenges which various projects spread across the globe face. This way commoners can help each other and learn from each other. My own work on *Remix* as a scholar-activist is a good example. The qualitative research I conducted on that platform, including interviews with urban-commons project leaders for a *Remix*-sponsored radio program as well as discourse analysis of documents known as "charters," forms the backdrop for much of the methodological part of this thesis. My contribution in this regard is two-fold. The first, derived from a close analysis of ten different charters from urban commons that I had come across on *Remix*, highlights so-called "chartering practices" which anchor an urban commons project in a charter (I have summarized the key themes and strategies of such chartering practices in a "Tactical Chartering Manifesto" that can be found in the Annex). And the second involves detailed presentation and analysis of three different case studies which, especially when taken together, illustrate the varying forms of specific urban commons projects that contribute to the ecological transition of cities. These case studies are central to how I argue for urban commons as tools for ecological resilience

While working on constructing the data base about different urban commons across the globe and taking a closer analytical look at many of these projects, it occurred to me that a lot of them had at one point or another mobilized their commoners to specify mission, structure, and/or rules of behavior of their commons project in writing. Very much extending in the process the tradition of Ostrom's (1992) "design principles" for commons, those acts of writing up these collectively elaborated, commons-defining declarations, best thought of as "charters," struck me themselves as acts of "commoning" if we take this notion to mean a social process of community involvement in resource creation, its management as commons, and the collective governance for its sustainable reproduction (Fournier 2013). Even though the dozen or so charters I studied had many distinct structures, often served unique purposes, and arose at different times in the life cycle of the commons, they also shared an impressive amount of common ground. Soon enough I started

working on constructing a so-called "Atlas of the Charters of Urban Commons" which prompted me to analyze textually those documents for overlaps and differences (see section 3.3.1). Following a more detailed discussion of ten of those charters (see section 3.3.2), I am presenting the results of this analysis in my thesis (in section 3.3.3) in terms of "chartering practices" which encapsulate the commoners' key strategies and tactics identified in the various charters as quintessential steps in the creation, management and preservation of their urban commons (see in this context also the "Tactical Chartering Manifesto" in Appendix A). I view such chartering practices as a key contribution to what urban commons do overall to get set up for long-term sustainable use by communities.

My three case studies, presented one after the other in chapter 4, have each their own theme, get set up quite differently, and follow very distinct objectives. Besides studying closely the respective charters of these three projects, which confirmed my earlier realization that tactical charters were good documents to look at when analyzing the "body and soul" of an urban commons, I also gained valuable insights and access to more material from extensive interviews I conducted with community activists strategically placed in each of these case-study projects as leaders. These allowed me to study the three urban-common projects more effectively from close up. Notwithstanding their highly varied social-process dynamic and different objectives, all three case studies taken together demonstrate how effectively urban commons can exist and thrive in a variety of topographic, demographic and political contexts.

The first case study, of the Bassin Versant Solidaire de Forest, involves creating a commons governance for an existing common-pool resource to turn a watershed into a commons as a means of more effective flood control. The second case study, of Agrocité on the western outskirts of Paris, involves a commons completely created from scratch in order to meet local needs for easily accessed resources that help the surrounding communities become more resilient and better self-provisioned. Of great significance here is also the fact that Agrocité is just one facet of a broader organizational "social and solidarity economy" infrastructure being constructed locally as a "third way" beyond market and state. The third case study, of Murs à Pêches in Montreuil on the eastern edge of Paris, involves a commons to be preserved as a heritage site. The surrounding communities have in this case developed a new governance framework to transform a cultural/ecological site

into a commons for better preservation. While highlighting the variety of urban commons experiences, providing convincing proof of the rich pluralism of modern-day commons (Coriat 2015), it is surely not a coincidence that each of these three urban commons projects presented here contributes in its own unique way to climate change mitigation and adaptation. They confirm thus the relevance of my thesis' focus.

0.4 The Structure of the Thesis

These theoretical and methodological considerations have provided us with a certain structure for the thesis, as follows. The thesis is divided into two major parts. Part 1 consists of the first two chapters (chapters 1 and 2), which provide a theoretical and historical overview of commons to arrive at the notion of urban commons. Following a typology, I provide for urban commons and an analysis of their potential for providing ecosystem services, I introduce here the urban commons as engines of climate change adaptation and resiliency. Part 2 comprises three chapters (chapters 3, 4, and 5), which focus primarily on my methodology and case studies. This second part introduces academic tools for conducting my research on urban commons. The case studies reflect the results that came from my methodological approach, while my contributions in terms of analytical tools are two-fold: the use of online urban development platforms as commons that nurture physical urban commons; and chartering practices, a crucial aspect of commoning activity producing charters which play an important role in a commons' governance structure. This part concludes with a transversal discussion on these case studies and how my contributions as methodological tools provide the analysis of each case study.

The first part of this thesis is dedicated to a literature review on the concepts of commons and urban commons. The literature review starts with a historical account (Chapter 1) of how commons, or common-lands at the time, thrived during the feudal system in England, where peasants would share the land for farming and social activities. The confluence of the Agrarian and Industrial Revolutions during much of the 18th century led to commons gradually getting eradicated by private property regimes as a new form of managing land and increasing productivity in farming, leading to the enclosure of common lands and eventually the disappearance of commons as capitalism and private ownership of goods became dominant features. Mançur Olson

(1965) and Garrett Hardin (1968) welcomed the destruction of collective action and commons as a way to praise the development of capitalism in the 20ᵗʰ century, essentially claiming that any form of commons had become obsolete and irrelevant to how societies conduct business at the time.

This argument was countered with remarkable effectiveness by Elinor Ostrom (1990) whose research helped revive the notion of commons. Not only do commons exist, but they are a key element in protecting common pool resources which are naturally occurring and susceptible to over-exploitation by individual greed. Ostrom claimed on the basis of her field studies that commons can succeed in being governed in a collective way so long as they follow a set of organizational principles capable of creating a functioning collective governance for the common pool resource. At the conclusion of this opening chapter I link Ostrom's revival of commons to Karl Polanyi's (1944) notion of "double movement" which captures the dialectical interaction between capitalism's marketization of everything and push for social protection against the dominance of such relentless market logic. In that context commons are a key counter-force pushing back against the commodification of resources in contemporary capitalism. Linking Ostrom's (1990) design principles for commons to Benjamin Coriat's (2015) conceptualization of commons makes it easier to underscore how and why theory and practice have both moved beyond Ostrom's natural resource commons into new applications. Charlotte Hess (2008) points in this context to commons applied to the internet, health, or knowledge.

In Chapter 2 we take commons into the realm of the city and relate them to the profound political, demographic, and environmental challenges cities face in the 21ˢᵗ century. When looking at such specifically urban challenges, as sprawl, gentrification, food deserts, or environmental racism, as well as at the complexities of the zero-carbon transition in an urban setting, it becomes clear that commons will have their role to play there. They also address another key challenge, namely that of regulatory slippage where a needed resource gets degraded because of negligence or incompetence of the local authorities. Urban commons are quite unique inasmuch as they follow their own specific principles. For example, they afford particularly strategic importance to various practices of "commoning." Whenever we discuss urban commons, we would do well having a broader theoretical grounding of the notion of "commoning" (Fournier 2013) as social process of

community involvement in resource creation and the collective governance for its sustainable reproduction.

Following a discussion of existing urban commons, such as urban gardens, business improvement districts, distributed energy systems, or occupied buildings, we can categorize different types of urban commons. We distinguish between ecological, social, and immaterial commons, depending also whether they are civil, communal, or private, thus giving a 3 x 3 matrix for the typology of urban commons. Another innovation we aim for here (in this chapter) is to conceptualize those urban commons as providers of a variety of important ecosystem services (e.g. provisioning, regulating, habitat, cultural) many of which neither government nor the market can provide for as well as properly managed commons. Considering the variety of urban commons and the large array of ecosystem services they provide many of whom crucial to address challenges which cities face, we have to see them also in the broader context of an evolving alternative paradigm to our crisis-prone, market-driven system, the "Social and Solidarity Economy," of which commons should be a key part. I have argued elsewhere, with the help of detailed case studies, that commons connect particularly well with cooperatives (Guttmann 2019; 2021). The end of chapter 2, which delves into the theory of urban commons concludes Part 1's general overview on the theory of commons and urban commons.

Part 2 of this thesis, starting with chapter 3, delves into my actual research and the contributions it brings to the academic literature. This leads us obviously to the question of methodology, comprising key aspects which I have already mentioned briefly earlier in this introduction. As I have already indicated, one key aspect of commoning, of crucial importance through different stages of the commons' life cycle, are charters through which the commoners define governance structures, mobilize active participants, establish partnerships with other actors, and regulate relationships with local authorities. Because of their strategic role in organizing the commons as a social entity, I refer to those defining documents as "tactical charters." I gather these tactical charters by using an online platform encompassing and linking urban commons together. This online platform is an example of PPOSUC, a central methodological tool with which to research urban commons for their contribution to render urban neighborhoods ecologically more resilient. Specifically, I used the *Remix The Commons* online platform as a central hub for a collection of

charters whose collective acts of writing and dissemination as commons-defining documents gave rise to "chartering practices" within a broader context of commoning activity. From a more extensive data collection work I undertook at the *Remix* PPOSUC I selected a data base of eleven charters for further empirical investigation, by means of discourse analysis, to understand more broadly how charters work with commons and practices of commoning. Three of those eleven charters address directly the challenges of ecological resilience and are therefore the object of my detailed case studies in Chapter 4. These three case studies, all very different from each other and as such testimony to the great diversity found among urban commons already in place today, all help us understand better how commons may advance their objectives of ecological resilience in urban neighborhoods. Analyzing these various charters, I propose a "tactical chartering manifesto" (see section 3.3.3 and Annex) summarizing and highlighting the key points of chartering practices which these documents share in common. That manifesto helps us understand what these case studies tell us about urban commons advancing ecological resilience.

As I have already indicated above, there are three detailed case studies in the thesis (chapter 4). The first involves a watershed commons on the outskirts of Brussels (Belgium) known as Bassin Versant Solidaire de Forest to cope with intensifying flooding problems for which the city has yet to find appropriate solutions. The second involves an urban farming and education commons known as Agrocité on the outskirts of Paris which is embedded in a bigger "social solidarity economy" project of urban renewal and thus part of a network of local partnerships with other SSE actors. And the third is a cultural legacy site, a historic site of local significance since centuries ago located in Montreuil on the edge of Paris, which is called Murs à Pêches for having been a unique center of farming of peaches in a part of France not usually inclined to have such a capacity. This site has found a second life as an urban commons engaging the local community in a variety of activities, but is now threatened by urban development projects.

All three of these urban commons are entirely unique, testimony to the high degree of differentiation and contextual specificity which these projects represent. But they are also sharing many things and features in common. This makes them meaningful case studies, especially when compared with each other, to illustrate and validate the key arguments I wish to make in this thesis about urban commons and their potential role in the struggle with climate change (in chapter 5) –

the creation of new common-pool resources and common goods best organized as commons, the mobilization of these resources for ecosystem services as "transitional urban resources" helping cities with their efforts at climate change mitigation or adaptation, acts of commoning to manage the set-up and reproduction of the commons, the potential usefulness of online FLOK and PPOSUC platforms in assuring the longevity of commons, the strategic role of tactical charters in the life-cycle of urban commons, and the integration of commons in a broader "Social and Solidarity Economy" framework of alternative actors capable of pushing capitalism in a more socially oriented, ecologically conscious, and sustainability-centered direction.

Part 1 – Overview from Commons to Urban Commons in light of Climate Change

The first part of this thesis is to provide a theoretical background on commons, particularly the notion of urban commons. As such, this part comprises two chapters, one on the history and theory of commons, and the other focusing on urban commons as one of the key identifiable commons in this world, along with immaterial and natural resource commons. Introducing the theory of commons, we start with Ostrom's revival of the commons as a common pool resource managed by communities who seek to make their resources reusable and sustainable. Towards that objective the first chapter identifies historical forms of commons dating back to past centuries and eventually up to the period when feudalism prevailed in medieval England. The feudal system contained commonable lands managed by peasants with their own governing rules on how to pasture the land perpetually without depleting its fertility.

Concluding our historical analysis in the opening chapter with the enclosure movement and its destructive impact on commons in 18th century England, we use a literature review to illustrate how a new chapter in the evolution of capitalism called for an ideological justification of private property's dominance and, linked to this, the logical suppression of commons-based land and resource management. As commons were killed off, some scholars (e.g. Garrett Hardin's "tragedy of the commons") presented those as a way to deplete lands and render pasture systems unsustainable This paper represents Hardin's misconstrued conception of what he called commons, and shows that he actually does not know what commons really are. Ostrom countered that argument with field research of her own and so helped revive commons, usefully identifying key "design principles" for their effective functioning. Her contribution to putting commons back on the map can be contextualized in a broader political context, best characterized by Karl Polanyi's "double movement" where collective action and organization in struggle with capitalist systems provide a basis for cooperative and common action.

In the second chapter the focus shifts to urban commons where a literature review is followed by an attempt at a classification of different types of urban commons as they can vary in form and

purpose. This preparatory classification and analysis leads us to the central question of our thesis, how urban commons can become vectors for climate change resiliency in urban communities. That question carries a few theoretical implications which I explore in the second half of the chapter One is how urban commons are producers of 'created' ecosystem services which make cities less damaging to the local environment and help cities become hubs of climate change resilience. Another theoretical implication addressed here is how urban commons can fuel a more robust social and solidarity economy. This presumes, as I shall argue here, that a civil society sector is needed between and beyond the public and private sectors to transition to carbon neutral urban economies. Urban commons can help cooperative models and vice versa, making the social and solidarity economy movement more coherent and comprehensive. The chapter ends with examples illustrating how urban commons can become low-cost yet empowering policy tools for cities and their various urban communities in support of climate change resiliency and the ecological transition.

Chapter 1 – The Evolution of Commons from Then to Now

The first chapter illustrates a timeline of the commons and their importance to institutional frameworks of countries over two centuries. To begin, section 1.1 provides a key literature review of the definitions of commons, tracing the notion to its origins. While highlighting the differences between the related concepts of common pool resource and commons, we can also conceive of commons as a type of common pool resource that is governable. For a shared resource to become a commons, it has to be endowed with a common property regime that makes it governable.

In order to understand the commons' resurgence of today and their relevance for tomorrow, it is important to look at how dominant commons were in the past. Section 1.2 offers a historical overview of the first preliminary forms of commons and so traces their origins. This historical overview illustrates what forms commons took during the period of the Agrarian Revolution when they were the main institutional framework governing certain basic resources used and propagated by peasants. Showing this history will also explain why commons were eventually depleted and replaced by private property regimes and private ownership to manage and distribute these basic resources. The Industrial Revolution and its introduction of markets happened at the demise of these common pool resources (CPRs), especially as several spaces and resources were enclosed for private ownership. A century-long period of enclosure brought about by the introduction of capitalist property regimes led to the widespread disappearance of the commons.

Section 1.3 introduces Garrett Hardin's "tragedy of the commons" as the key document explaining why the commons disappeared when private ownership and market regulation of resources put excessive emphasis on the efficiency of resource management, something that did not seem possible with commons as the dominant institutional form. While these new capitalist regimes were deemed successful, especially after the industrial and manufacturing boom following World War 2, several groups have suffered from the disappearance of commons. As many people were subject to difficult factory jobs dominating their lives, they had become dependent on these capitalist regimes. In the process, it was impossible to access basic resources without going through markets and paying prices that would help firms increase their profits. Their work in factories was devoted to simply being able to feed themselves through market regimes for food.

As some people felt the injustice of this dynamic, new institutional forms of governance for the management of these resources were re-explored. Several groups decided to manage certain resources collectively in order to avoid going through markets to sell and buy these resources. For example, the fishermen in Maine realized that exploiting the lobster fisheries subject to the profit logic of the marketplace had become unsustainable and even dangerous for the bio-region, because there was a great risk of overexploitation. So they decided to implement collective governance rules transforming these fisheries into a commons, with a set of rules that were enforced collectively by the fishermen themselves, including monitoring and sanctioning those who broke the rules. This was done to make the fisheries sustainable, and this process was analyzed by Ostrom, who, with her writings, documented a revival of the commons in the wake of capitalist regimes destroying natural resources and rendering them inaccessible to the lowest tiers of the population.

Ostrom's (1990) famous paper on "Governing the Commons" represented this revival of the commons, which she only got to analyze in the mid-1980s. This revival was indication that some groups of people were moving away from markets towards commons-based regimes. They did so to gain access to basic resources so as to have full control and autonomy over how those were managed and distributed among themselves. In section 1.4 we return to Karl Polanyi's notion of "Double Movement" to explain the enclosure of commons and its recent resurgence, putting in perspective how capitalistic forces emerging during the industrial revolution triggered these cycles of commons' existence amidst a growing commons movement. Polanyi's double movement captures the key engines for the resurgence of commons and places them into the broader context of the "Social and Solidarity Economy" as a socio-economic and socio-political counter-movement.

It is important to note that Ostrom was one of the scholars who put commons back on the map, and she won the Nobel Prize in Economics for her contribution. Her analysis of CPRs managed as a commons could be applied to several other sectors beyond natural resources, the key focus of section 1.5. Here we introduce the work of Charlotte Hess (2008), an important scholar applying commons to other sectors such as the internet and in cities. This angle brings us to the notion of urban commons. It is from her legendary paper of mapping the commons that urban commons

emerged as its own separate theoretical construct, bringing us at the conclusion of chapter 1 to the main subject of the thesis.

Section 1.1 A Brief Theoretical Introduction to the Commons

In order to take the first step in developing answers to general research questions about the commons, a definition and a theoretical background discussion is necessary. It is important to note that finding an adequate definition of the commons has proven not to be a straightforward process. Holder and Flessas (2008) point to the fact that commons contain a variety of shared interests and values which are difficult to generalize, not least since those may be driven by different cultural and historical identities that cannot be easily grouped together. As a matter of fact, a variety of scholars have very different interpretation on what commons can possibly be.

The commons should be recognized as an ancient concept. They have been traced back to their historical origins by scholars like Linebaugh (2008) and Helfrich et al (2010). For example, Helfrich et al (2010) identifies the codification of Roman Law in the famous Code of Justinian (529 AC) as one of the first documented times society has referred to some societal goods or matters as "common". Back then, they were labelled "res communes", by which the code meant, according to the Merriam Webster dictionary, "things owed by no one and subject to use by all" or "things (as light, air, the sea, running water) incapable of entire exclusive appropriation." Such resolutions of commonly shared goods extended all the way to the 19th century when commons in England were considered as a "village green" or village space that required some level of organization and self-selection. But its features allowed a community to be formed or prosper as the individuals felt a sense of 'belonging' in the face rapid exclusion. These communities became the hallmark of how commons were managed as 'common lands' (McGillivray and Holder 2007). This historical overview of the commons will be discussed in section 1.2 as we trace the origins of the definition and seek the most adequate one for today's global environmental crises.

Arising from the notion that commons have been historically seen as shared communal land, some scholars have chosen to stick to that idea of commons being the resource or resource system itself. This perception is evident in Ostrom (1990) when the commons were reintroduced as a common

pool resource. In this traditional perspective, commons as CPRs are resource systems that can produce resource units by nature. Those resource units are appropriated by individuals. But their appropriation is managed through collective action among other resource users. Therefore, the resource system would contain collectively managed rules and rights of use that make commons 'long-enduring, self-organized, and self-governed" (Ostrom 1990). Some scholars have redefined commons as property regimes in the context of a fight against the transformation of 'commonable land or commonable resources' into private property. For example, Mitchell (2008) refers to commons as 'liberal access regimes' where property rights are shared and the modalities of their sharing are determined by social relations guiding access to the property. In this context commons become heavily linked to common property regimes (which I will define in section 1.1.3 as being a part of the definition, but not what defines a commons *per se*). Defining commons mainly by their property regimes focuses our attention predominantly on the 'shared' element of the property rights of the resource, and less so on how the resource becomes sustainable through shared use and collective decision-making as pertains to the rules and norms. Focusing on the resource and its property regimes diverts us away from the 'social' element of commons.

This perspective has been labelled by some scholars as a land-based or good-based conception of commons, focused on the historical issues related to the access of the resource or space alone (Euler 2018; Holder and Flessas 2008). Such a perspective is quite limited, because it focuses mostly on the physical and natural features of a resource rather than the social complexities that make a resource a 'common'. We cannot just assume that a resource with collective rights is a commons. The communities and their collective interactions with the resource are hence of minimal concern in this perspective, and that is a mistake. Ostrom (1990) reminds us that the success of commons depends on those interactions. Therefore, a definition that also focuses on how commoners interact with the resource and each other is essential if we want to be coherent about what commons really are.

While Ostrom (1990) triggered a breakthrough in how we have come to understand commons, her path-breaking work has motivated some scholars to go beyond the resource itself and view commons as a system of social practice. For example, Muhl (2013) states that resources in general are not yet commons, but may become that if managed collectively. The missing component here

are the social relations and practices that are behind the collective management. The social practice is decided by the members of a community who may share a common purpose of sustainably managing a space or resource they depend on. Such a dynamic depends on the social relations within that community. Therefore, these social practices and relations reassure a sustainable collective use of the commons through a governance that is collectively decided upon. Scholars like Linebaugh (2008), Helfrich (2012a) or Meretz (2012b) refer to these social practices as 'commoning' which they all regard as being at the core of what defines commons. This supports the claim by Helfrich (2012) that commons do not simply exist, but are created. The social practices create those sustainable governance schemes, and these are what turn the CPRs of Ostrom's (1990) definition really into commons. It is important that this aspect becomes a part of the definition, either through the idea that commons are made up of communities or that the commons are developed by the social relations that exist around a CPR.

In addition, some scholars have also explored how commons can be defined as a political tool to counterbalance the forces of capitalism causing communities to be fragmented and marginalized. The political force of commons rests on those very social practices that represent the commons' collective governance schemes. For example, De Angelis (2013) claims that commons are communally formed measures of getting community voices heard. This capacity allows commons to foster a new political discourse that is relevant to facing the many existing political and economic struggles various marginalized communities face. This view is very relevant to how we define commons, especially in the context of this thesis wishing to argue for a crucial role of commons as policy tools that help us come up with solutions related to climate change adaptation and mitigation, an urgent topic which has already been heavily politicized in all kinds of other ways.

However, there is a possibility that these scholars focus their definition of commons exclusively, or at least too much, on the social process as a commons itself to the detriment of considering the resource system itself. This view is problematic, because it takes us away from the very idea that commons are tied to resource systems from the start. It is imperative that commons remain about the resource and not just highlight social interactions. While it is true that commons cannot exist without the notion of commoning, these two concepts must be tied together. Commoning activity

is the social process behind what makes a commons a governable CPR subject to rules and norms which it helps to determine and shape.

Both directions in which scholars view the commons have led to a myriad of ways we understand commons. They are either social, physical or both. Both interpretations are what allow commons to be stretched across the spectrum of resources, from the immaterial sources of knowledge and information that are accessed through web spaces to physical spaces of interaction and sharing that are accessed through the communal use of a CPR. Both views are clearly valid, but separating the two notions in the definition can be misleading if we are to find a coherent path in how we define commons in the literature today. Neither, standing alone, may provide the clarity with regard to how we identify commons today. Hence an umbrella definition mirroring both the good-based perspective and the social-base perspective must be included to make the argument of this thesis more fluid. One scholar that has achieved such a definitional integration is Coriat (2015), who uses elements of both perspectives to provide a simplified yet extendable definition. The simplicity and hierarchy of his definition will also allow us to make commoning and the social processes that define commoning even more essential dimensions of the commons, and this will be explored in the following section of the thesis.

As the world faces increasing environmental problems, many triggered by the imbalances of capitalism, several groups of people have started to seek alternative forms of resource management. In the process, they develop new social norms guiding access to an array of basic resources so that adequate access to those would no longer depend on either market dynamics or state aid. The commons have been an increasingly coherent and widespread alternative solution to resource management that steer us away from raw capitalist regimes. The commons involve a strategic set of collective norms that make resources attainable in autonomous fashion.

The most clear-cut definition of the commons comes from Benjamin Coriat (2015), for whom the commons is composed of a coherent mix of three key characteristics. According to him, commons are typically comprising the shared common pool resource itself, the community that depends on and thrives on that resource, and a collective governance structure which activates a shared management scheme assuring the longevity and sustainability of that resource. The precise

definition he elaborates has the commons act as a system of social relations and property rights that are shared between the members of a community, rather than have those privately or publicly owned. These social relations are what constitutes a community. Therefore, it makes sense to define commons-based communities as social units that develop social interactions and relations in the usage of a resource that they all collectively depend on. From that dependency, communities will develop shared norms, values, and forms of identity that keep the community integral.

Since commons are found to be either material or immaterial, communities will follow suit on these resources based on a geographical physical space shared among people of that community, or virtual spaces such as platforms. Social relations that happen in these geographical spaces often create long-term engagement with each other which allow them to share their collective identity and determine their collective objective or interest together. And while communities can vary vastly in scale, from a group of people living in the same neighborhood all the way to global communities involving very large populations, they still maintain the key notion that people must develop social ties and affiliations, while pursuing collective goals catered to the needs and interests of the community itself.

In the case of the commons, those social ties are oriented towards the sustainability of a common resource they depend or thrive upon. From the social ties that develop around that resource, the community will determine a relevant governance structure facilitating this sustainability. And that governance structure will be based on the collective rules and norms that are decided and created by the social ties communities are bound to make when an interest is shared. When a common resource pool is maintained and shared by the community itself rather than privately or publicly owned, that engagement will nourish the community as such. While sharing is key for these types of commons-based property ownerships, some level of exclusivity is involved. This is precisely why such resources veer away from public good features like non-excludability. That excludability applied to shared resources is enforced by the communities around the commons themselves. Shared forms of property rights are a key feature of commons which allows governance structures to be created and enforced as part of what defines a community as such.

These new governance structures are the key aspect of commons to analyze. They determine after all how commons can work not only for communities who are isolated or fragmented, but in ways where those communities can become independent and autonomous from market or state provisions. That is an essential objective when trying to find adequate proposals and legitimate solutions for the ecological transition. We note here that Coriat's definition, while based on years of analyzing Ostrom's research on the commons, is more clear-cut and precise than what Ostrom left us as her definition.

Coriat's definition is very specific about requiring those aforementioned three distinct characteristics to be considered a commons. Yet it is also flexible enough to include a large array of diverse commons structures which may have very different ambitions, personalities, and distinct features. Allowing for greater versatility makes it actually easier for scholars or activists to pinpoint what a commons is and what it is not. All it takes is identifying the shared resource itself and the community around the usage of that resource, then analyzing the governance structure that allows this community to have full autonomy and control over who uses those resources and how.

Coriat's three-pronged definition has made it easier for researchers to develop key concepts related to the commons and in the process develop a much more universally accepted and cohesive language about the commons, a goal that the academic literature on the commons still struggles with today. Since one of the goals of this thesis is to help further advance a universally accepted language system for commons, it aims to provide a clear explanation on the differences between commons, common resource pools, and common property regimes. That task is best undertaken by providing a historical overview of the development of commons and its language in the academic literature.

1.1.1 Distinguishing Common Pool Resources (CPRs) from Commons

We must distinguish common pool resources (CPRs) from commons and explain the difference briefly. CPRs are certainly not commons. While CPRs have some level of collective rights of use by an indefinite set of individual users, such access and use are not necessarily governable. Therefore, it is not possible in such an instance to define a community whose social practices are

collectively orchestrated and governed together. The users have uncontrolled access to the resource, and no one can possibly stop them from overusing or depleting that resource. CPRs this tend to be directly subject to the overexploitation and abuse which scholars like Hardin (1968) were so keen to point out. Laerhoven and Ostrom (2007) consider fisheries, forests, irrigation fields, and water bodies as typical CPRs, and these remain ungovernable even if several people use them.

By contrast, commons are based on the social practices and institutional arrangements that make the resource sustainable and protected against overuse. When a well-defined community depends on a resource for economic and physical survival, its members know that overexploitation must be avoided at all costs. This knowledge prompts them to implement rules of enforcement and monitoring, which reflect the social practices the community has developed with regard to this resource and are meant to assure its sustainability for the community depending on its long-term health. An example of this is Ugo Mattei's (2011) perspective on commons, based on context and contingency. The commons become the main form of governance when users of a CPR find that either privatization or government bureaucracy interfere with the best possible utilization of the resource concerned and so realize the need for a different modality of its management.

Mattei (2011) uses water as an example. Water is a natural resource whose very nature makes it difficult to exclude users from. But it is possible that bodies of water become privatized or subject to restrictive policies on the part of the government, rendering them thus insufficiently accessible. When this happens, users will do whatever they can to manage the water as a commons. As such, the political dimension of the commons is determined by its context and the capacity of people to take responsibility for the management of that resource. That management becomes collective. It thus becomes clear from this distinction that a commons can be regarded as a CPR to the extent that it is a resource system itself whose use and access are subject to rules and norms enforced by collective governance. But the same does not hold the other way around. CPRs can be shared by users without enforceable restrictions. This clarification, according to which commons can be defined as a type of CPR with governable rules and social practices by communities, helps us avoid any confusion between the two concepts.

Taking our cue from the key characteristics of commons highlighted by Coriat (2013) to grasp their specificities better, we need to analyze commons by observing the nature and origins of CPRs, their common property regime as a feature of a shared CPR, the communities that characterize the usage pool of those CPRs, and the governance structure that enable CPRs to turn into commons as they become socially designed to thrive in their specific local contexts. Sections 1.1.2, 1.1.3, and 1.1.4 will each be sections that correspond to these four steps in explaining the definition of commons through the lens of Coriat (2013). This four-step process starts with the notion that commons are a particular type of 'governable' CPR. Some key scholars like Ostrom (1990) define commons in a goods-based way, thereby categorizing commons as CPRs due to their natural characteristics. To fully understand this approach and the elements that make Coriat's (2013) definition valid, a literature review of CPRs is appropriate here.

1.1.2 Common Pool Resources (CPRs)

We need to dissect the three characteristics of commons determined by Coriat (2014) to better grasp the specificities of what a commons really is. This analytical process will require observing the nature and origins of CPRs, the communities that characterize the usage pool of those CPRs, and the governance structure that enable the commons to thrive in their specific local contexts. As the definition starts with the nature of CPRs, a literature review of CPRs is appropriate here. The CPR is a concept that was famously debunked by Hardin in his discussion of the tragedy of the commons. When Hardin referred to 'commons' in his famous 1968 article "The Tragedy of the Commons," he was actually explaining the risks of overexploitation these resources bear as long as they are openly accessible (i.e. non-excludable) as common pool resources.

In Ostrom's legendary work on the commons she uses two criteria to define CPRs. She claims that CPRs yield a constant flow of resources which users benefit from most by pursuing self-governing institutions guiding their access. The second criterion is that such a flow of resources makes access by users very difficult to regulate. Prevailing mechanisms of self-governance for commons must include some degree of excludability, for example, applied to those who do not respect the rules that are collectively decided upon. Management of CPRs can therefore only achieve success

through collaboration of its users, which is why self-governing institutions (like commons) to manage the resource are imperative for the health of that resource.

Neither full privatization nor government control can work as well when it comes to CPRs. Ostrom (1990, p. 1) states that "communities of individuals have relied on institutions resembling neither the state nor the market to govern some resource systems with reasonable degrees of success over longer period of time." (Ostrom, 1990, p. 1). Through a series of case studies she proves that, beyond the options of either privatization or government control, we can most effectively ensure a healthy, reusable, and sustainable resource when we collectively work as a group pursuing a common interest and creating institutions of self-organization for unmanaged CPRs.

Following Ostrom's definition of CPRs, Berkes, Folke, and Colding (1998) define CPRs as a 'class of resources for which exclusion is difficult and joint use involves subtractability' (p. 5). Here subtractability refers to the extent to which one individual's use of a resource diminishes its availability for other users. Based on this definition, CPRs share the feature of inexcludability with pure public goods while their characteristic of subtractability is shared with pure private goods. However, exclusion is possible when CPR users detect free-riders, depending on the self-governance rules they have put in place. By that point, those CPRs subject to free riding are now protected by the collective institutional arrangements of the community around those resources, and they officially become a commons. And while subtractability might affect the self-governing component of CPRs, users can cooperate on rules of access and usage to assure fair and sustainable use.

Such a conclusion has also been highlighted by Feeny et al. (1990) who claim that CPRs become commons when they can be held by an identifiable community of interdependent users. Such a community is able to target outsiders and exclude them as a method of regulating the use of the resource. Such excludability ensures the sustainability of that resource. Feeny et al (1990) confirm that some form of exclusion is needed, and that this prerequisite becomes a rule of the commons rather than an exception.

These various definitions all imply key aspects that define a CPR as commons, worth summarizing here. To begin with, CPRs as commons are managed by a community rather than either the state or the market. Eligible members of the community share a collective interest in the CPR's long-term sustainability, and for that purpose decide how to cope with free-riders and regulate access among themselves. The combined sharing of CPRs and exclusion of non-participants require also a foundation in shared property rights. Such shared forms of ownership of a CPR as commons are known as common property regimes, and it is worth analyzing how the various attempts at defining CPRs as commons incorporate those.

1.1.3 Common Property Regimes

Bromley (1991) provides a good summary of the intrinsic advantages of common property such as its management in very large units caused by indivisibility (e.g. forests), nature's inherent imposition of uncertainty as to location of productive zones, facilitating internalization of externalities by communal management replacing one-on-one deals, and greater administrative efficiency. The paper also lays out basic conditions for how best to manage common property regimes as such. The author claims that common property regimes share some aspects with private property regimes to the extent that there is exclusion of non-owners or non-users involved. Owners have the right to exclude non-members, and non-members have a duty to understand and abide by that exclusion. This is also why common property regimes must be distinguished from open access regimes which are based on mutual privilege by everyone without any rights being instituted. The people involved with the ownership of a property regime may differ in size, context, and internal structures, but membership and boundaries are still present while common interests are nonetheless clearly defined by the owners.

Crucial to common property regimes, in contradistinction to private property regimes or open access regimes, is that users, who are not co-owners, also have rights to participate in the decision-making process managing the CPR as commons. Common property regimes have rules defining the use and management of that resource. Rights apply, and privilege is defined, by one's involvement as a co-owner or entitled user in deciding how best to govern levels and sequencing of participation. Common property regimes thus are typically managed in hierarchical fashion,

grouping together co-owners and entitled CPR users, while also enforcing rules of exclusion. This inclusive decision-making process allows all users to be implicated in collectively assuring the long-term sustainability of the CPR as commons. Yet the process is also discriminatory, because it determines who to exclude as non-users.

Stevenson (1991, pp. 40ff) takes Bromley's analysis to the next level by highlighting seven key characteristics of common property regimes, representing the necessary conditions for their successful management. He starts with the physical and social parameters of a common property. Those parameters must be well defined in order to prevent mal-intent or confusion with other property structures in a given area. The property regime must also clearly define the group of users sharing the responsibilities for this property in order to distinguish them from those excluded. That being said, the property regime must also cater to a diverse set of multiple users who are each a part of the sustainable extraction of that resource. Those participating in the extraction of the resource must abide by a set of collectively decided and well understood rules that determine their rights and duties of responsibility. The users must extract the resources in equitable ways so that other users get their share without having to over-exploit or deplete the resource itself. While some users may compete with each other for resource access, they must come up with mechanisms that prevent over-exploitation. Even though the resources are of common property and therefore collectively managed, there must be some level of hierarchy based on who holds or enforces rights of use in order to keep the management effective in achieving the collective goal.

Schlager and Ostrom (1992) have reintroduced the idea of a 'common property ownership' to provide property rights fairly and efficiently when resolving the imbalances that arise from either public or private property ownership. The definition provided by Schlager and Ostrom (1991, p. 250) is 'common property rights to a resource pool is property owned by a community of multiple users working together to maintain and manage a resource.' They classify the types of users that have distinct property rights in hierarchical structure, from authorized user, to claimant, to proprietor, to owner.

Authorized users are defined as individuals who hold collective-choice rights of management and exclusion. They lack authority to devise their own harvesting rules, or to exclude others from

gaining access to the resource pool. They also lack the authority to participate in collective action to change operational rules.

Claimants are defined as individuals who possess the same rights as authorized users, but they also hold the responsibility to manage the resource pool while having the collective-choice authority to devise operational level rights of withdrawal. In addition, they have the rights to management, which means they have the authority to determine how, when, and where harvesting from a resource may occur and whether the structure of the resource may be changed. For example, a group of fishers who devise a zoning plan limiting various types of harvesting activities to distinct areas of fishing are exercising rights of management for their resource. However, claimants cannot specify who may or may not have access to the resource, nor can they alienate their rights of management.

Proprietors are defined as individuals who possess the collective choice rights to participate in management and exclusion. They can authorize individuals who may have access to resources and how the resource may be utilized. They decide who is authorized through qualifications that individuals must meet in order to access a resource. For example, fishermen who are proprietors may limit access to their fishing grounds to males above a certain age who live in a particular community and who utilize particular types of gear, thereby exercising their right of exclusion. But they do not have a right to alienate either of these collective-choice rights.

Owners have all of the rights as proprietors, but in addition they possess the right of alienation allowing them to sell or lease their collective rights. When putting these bundles of rights together in a hierarchical order, it is possible to have entry rights without withdrawal rights, have withdrawal rights without management rights, have management rights without exclusion rights, or have exclusion rights without the rights of alienation. While owners have the full property rights of a natural resource, owners are not the only resource users investing in the improvement of resource systems in the long run. Proprietors and claimants are also keen on encouraging long term investments, not least because they possess some kind of collective-choice right through which they can participate in defining and exercising future rights designed to maintain a CPR. This

makes the collective choice rights a powerful tool for exercising social justice and environmental sustainability.

In addition, these collective-choice rights are established in a de-facto property-right system, which is based on resource use organized and enforced among individual users and not recognized officially by government bodies. De-facto rights are different from de-jure rights, because de-jure rights are enforcements by governments in the form of formal and legal instrumentalities explicitly granting rights to specific individual resource users. This implies that any conflicts within property rights can be settled in a judicial setting. In such common property regimes, there are several cases where de-facto property rights work in conjunction with de-jure property rights established by the government. In some cases, when governments do not have the means to enforce rules fully and sanction those that break them, de-jure rights might be set up as a basis of ground rules to which resource users can appropriate de-facto rights established around these ground rules. Such de-facto rights could serve as mechanisms to protect a natural resource.

The establishment of de-facto rights is particularly relevant to common property regimes, because they motivate the creation of collective-choice rights designed to implicate all resource users. De-facto rights can become a particularly powerful tool when governments pay little attention to the resource, giving all resource users the opportunity to gain autonomy and define rules as well as operational rights for and by themselves. With workable arrangements in mind, collective de-facto property rights set up within a common property regime can lead to efficiency in using and maintaining a resource. It is within the context of this theme of property rights that this thesis promotes a new and effective solution to the socio-economic and environmental issues we face in our society today.

Combining these characteristics together, a common pool resource under a common property regime will be protected by its users who will enforce rules or norms that might prevent resource depletion. In order for a CPR to become a commons, it must also have a common property regime. In this way, the CPR as commons provides forms of shared property rights to allow its users to have full control over how the resource is extracted and managed. Those property rights also determine who has access to the resource and who does not. Those users who have procured shared

property rights can then come up with governance structures that follow those found in commons. Common property regimes are thus the foundation of how commons are organized.

With these concepts explained, we can now determine the proper theoretical framework of a commons going back to Ostrom's (1990) eight design principles constituting a commons framework. Those principles are:

1. Define clear group boundaries.
2. Match rules governing the use of common goods to local needs and conditions.
3. Ensure that those affected by the rules can participate in modifying the rules.
4. Make sure that the rule-making rights of community members are respected by outside authorities.
5. Develop a system carried out by community members for monitoring members' behavior.
6. Use graduated sanctions for rule violators.
7. Provide accessible, low-cost means for dispute resolution.
8. Build responsibility for governing the common resource in nested tiers from the lowest level up to the entire interconnected system.

Ostrom's principles frame the governance structure whereby common property regimes can be turned into commons, providing the third element of commons in terms of how Benjamin Coriat (2014) has conceived of them in his book *Les Retours des Communs* as a resource of space with some form of shared access, a community preoccupied collectively with use and preservation of that resource, and the ability of that community to govern the common pool resource under its command autonomously without outside interference.

In conclusion, we have introduced a rich literature aimed at defining the commons as occupying a unique space in social organization. The argument goes from common good (in contra-distinction to public good) to common property regime to commons. In this elaboration, we need to start by distinguishing a public good from a common good. According to Samuelson (1954), a public good has the same qualities as a common good, namely resources that are non-excludable, meaning that

everyone has a right to the use of that good without any form of exclusion, and that are non-rivalrous, meaning that a user consuming that good cannot affect another user's consumption of that good. In addition, such goods are meant to accommodate all users without conflict. A common good however, and here we use the definitions in Schlager and Ostrom (1990) and Gureshidze and Guttmann (2016), carries the characteristics of non-excludability and non-rivalry as a common-pool resource but only up to a point. If a CPR is defined as a natural or human-made resource that a priori is non-rivalrous and non-excludable due to its size and characteristics, a CPR will always be subject to becoming finite and unsustainable. By then, it is necessary to introduce some sort of rivalry and exclusivity to maintain the resource. Therefore, the sharing aspect of the resource is decided by the members who use it in a regular manner. This may very well imply the need for a common property regime defining rights of ownership and access. And the decision-making process of the community of users governing the use and preservation of the CPR turns it into a common based on explicit governance rules ("design principles") of the kind put forth by Ostrom (1991).

Section 1.2 Delving into the Historical Context of Commons

The history of the commons is incredibly complex, and it has gone through cycles of prevalence, but also destruction and decay. Before the rise of capitalism commons were ubiquitous arrangements which allowed people to obtain the basic necessities of life. But the relentless emphasis on technological advances, personal wealth accumulation, and individual freedoms associated with capitalism made commons less viable over time, if at all. However, capitalism also brought about widespread social and economic injustice which in more recent years has ironically prepared the ground for a revival of commons. In the following section, we shall take a brief look at this checkered history of commons.

1.2.1 The Prevalence of Commons before the Agrarian Revolution

During the times when humans were hunting and gathering, commons were prominent across the entire globe. Territories were established as communal, and were therefore given to a tribe instead of a privately held land under the control of individuals. After societies were formed into empires,

commons were a crucial form of governance, and empires thrived in the preservation of commons. For example, the ancient Greeks were the first empire to designate shared natural resources as common good available to all. Water, which had no specific boundaries, was labelled as one of the first recognized commons by a governing or authoritative body. This made diplomatic relationships unfolding in bodies of water much fairer and easier to govern, given its boundary-less nature. The Romans were the next major ancient empire to adopt usages of water as forms of commons. Roman law specified explicitly that water was a common that was free and accessible to all. The Romans actually considered all bodies of water, shorelines, wildlife, and air as commons. Resources found in these natural habitats were classified as 'res communes', which meant resources available to all. This allowed farmers outside of big cities to use the land collectively and produce efficiently for the people of Rome.

After the collapse of the Roman empire, the Middle Ages emerged as a time when commons were used the most. They emerged as a response to the absolutist claims by the King that all aspects of land habitat were under his authority. Across Europe kings often claimed rivers, forests, and wild animals as their own property. At the same time, you had the feudalist system evolve in decentralized fashion around the "lord of the manor" and his dependents, a population of laborers working the surrounding land to support themselves and the lord. They could pay him in kind for use of the land, or later on with cash, but beyond that obligation possessed collective rights to use the land for their own subsistence. The contradiction between the King's absolutist power and the shared practices of the manor created a rich source of tensions, notably first in England where King John was forced to sign the Magna Carta into law in 1215 whereby he had to accept forests and fisheries as 'res communes' (Fairlie 2020).

From the mid-17th century onwards the Second Agricultural Revolution propelled England to having the most technologically advanced and productive agriculture in the world. One of the consequences was the freeing of labor which eventually would turn into the urbanizing labor force driving the Industrial Revolution from 1750 onwards. Another consequence was the deepening of private property, including that of land, which had devastating results for the hitherto widespread commons. The case of England during the agricultural revolution shows one of the most explicit

cases of the decline of the commons. It is therefore an ideal national system to observe the emergence and the destruction of commons.

Until then, for most of the Middle Ages, the dynamic of farm commons was integrated into the prevailing feudal order. While the property was already owned by a large governing monarchy, the property was always shared. As such, the nobility and priory who owned the rights to land loaned peasant farmers the holding, as well as the land that belonged to it. In exchange for this loan, the peasants had to pay the rent of the holding. The payments were made by the peasants who had to perform labor tasks for nobility, and they were always subject to the jurisdiction of the landlord. This jurisdiction was possible because the commons were controlled entirely by the landlord, who was known as the 'lord of the soil of the common'. Agriculture depended on privately owned 'common' land, but could be used by others who each enjoyed the legal right to access the land.

One can see how important commons were for the majority of the population that was not affiliated with the kings' rule. The commons were part of a feudal system, where arrangements were made between peasants to use the land for their farming activities. This feudal system, which was eventually the main form of communal farming at the time, were made up of strip fields and associated common wasteland in which animals were grazed and crops were harvested. While there was a lord that would officially own the land, the lands were open to any farmer. The lands would mostly be used by tenants, and they had the rights to use the land for farming, grazing, wood, and fuel. No individual had more power or accessibility to those lands than other individuals, so it was a very communal based form of property rights.

The people with access rights to the land were known as 'commoners,' defined as people who had access to common land. (Neeson 1993). While there was private ownership by the royalty of a territory, people's lives were determined by democracy, egalitarianism, and self-sustainability. As a matter of fact, people would be involved in the local elections of a governing council. The governing council was obligated to hold meetings in a public space to decide on the distribution of plots of land, scheduling of multiple uses and responsibilities, and arrangement of fees for pasturing animals in order to prevent overgrazing. Generally speaking, land management was

based on common lands being used to plant crops, graze livestock, glean, forage, hunt, fish, and provide wood as well as turf as a source of fuel.

This form of land management was known as an open field system, where the King or the 'Lord of the Manor' owned an estate, but the peasants enjoyed all sorts of 'usufructuary' rights which allowed the individual peasant to perform all of the aforementioned agricultural activities (Wall, 2014). The open field system worked best in certain cases where the movement of a resource or the production of a good required a team to complete the task and could not be undertaken by an individual alone. The history of the open field system is rooted in the idea of teamwork and performing tasks collectively. This system was derived from the introduction of the large wheeled plough known as the caruca. The caruca was used to manage and mobilize resources in England's heavy clay soils. The Gauls invented it to deal with soils rather than the lightweight material known as aratum from Rome. A group of oxens was the only way the caruca could be pulled and turned around, especially when it was being used in heavy soils. Because the peasants could not afford a whole team of oxens, a joint team enterprise was formed to manage the investment of the ox team, the strips of land in which the caruca would be used in, as well as rotating and managing the farming of the land.

The idea of a joint enterprise to obtain and manage an ox team is symbolic in the governance of the commons. Each peasant would develop strips of land that were proportioned to his share of investment in the ox team, and the lands were farmed in either a two- or three-course rotation. For one year, the peasants would decide to turn the land fallow, because each peasant needed the equal number of strips in each section to maintain a constant crop on a year-to-year basis. A couple of rules were enforced within this joint enterprise in self-governing fashion. For example, there was no possibility for individual lots of farming, since a peasant's crops in the absence of enclosure would surely get grazed by everybody else's animals. The peasants also had to obtain their hay from communal meadows in order to feed the livestock.

Orwin (1938) gave a clear interpretation of the rules and settings of a typical open field system in Britain. He said, "A man may have no more than an acre or two, but he gets the full extent of them laid out in long ″lands″ for ploughing, with no hedgerows to reduce the effective area, and to

occupy him in unprofitable labour." Orwin is emphasizing here the idea that each peasant may only formally claim one parcel of the land. But because that parcel is part of a greater common, that peasant will have access to a much wider range of land for his cattle. Orwin continues by saying, "No sort of enclosure of the same size can be conceived which would give him equivalent facilities. Moreover, he has his common rights which entitle him to graze his stock all over the 'lands' and these have a value, the equivalent of which in pasture fields would cost far more than he could afford to pay." Here Orwin highlights the range of access for each peasant when becoming a participant to the open field system. The author insinuates that becoming part of a larger system of self-governance means there are a plenty of benefits to accrue. The vocabulary used to emphasize this point is 'value'. Orwin explains value in this context as measured by the difference between the cost of having access to such vast lands for grazing livestock and what the peasant could afford to pay to own or use that same equivalent mass of space. (I got Orwin's quotes from an article written by S. Fairlie entitled "A Short History of Enclosure in Britain in *The Land* issue of Summer 2009)

The peasants felt the benefits of the open field systems in many instances. First of all, the open field system encouraged economies of scale in terms of farm production. Since there was already a team set up to take care of the oxens, it was easier to perform complicated tasks that required a group of people. Farmers worked together to achieve accessibility to the open field. The major drawback of working collectively as a team to achieve economies of scale was giving up freedom. When the economies of scale were not equally distributed, people had no choice but to try producing more than others. The scale of farming for each farmer was better kept as closely proportional to the other farmers as possible. This became an even more challenging issue when land became scarcer due to increased population pressure. Farmers could no longer claim land so easily without there being a dispute. When a single plot of land was divided among three farmers, the pressure to divide the arable land into strips and manage those semi-collectively became paramount. Prior to the Agrarian Revolution, uncultivated lands were widespread so that people could claim private plots of land without impeding too much on the production and lifestyle of others. Freedom is sacrificed here as well, but farmers operated better and reaped more benefits when they were part of an open field system.

During this system of governance, two types of land management appeared. One concerned the extensive cultivation of grazing land for cattle, while the other involved managing and preserving the woods to gather resources for feeding the cattle due for grazing or obtaining fuel to cook or storing agricultural products (Zeckert 2016). Because of the very temperate climate in England, it was imperative for farmers to gather the fodder for the cattle. During the winter, the cattle were required to feed on rough pasture because of the weather conditions. So in order to feed them, the fodder would have to be gathered from the woods prior to raising the cattle in the winter time. The amount of livestock an individual had depended on the amount of hay available as winter fodder. The amount of hay available was entirely dependent on the size of the woods themselves, which could only be sustained if they were governed in the form of a commons. This common land system of governance in agriculture had sustained families for centuries. But that long-lasting arrangement of common lands quickly changed in the course of the Agrarian Revolution at the beginning of the 18th century.

England was under Saxon rule, and that continued through the era of Norman serfdom. After the Black Death, serfdom paved the way for a money economy that would advance through a leasehold. This leasehold consisted of a customary land tenure known as the copyhold, which marked the beginning of the privatization of arable land. However, these specific changes did not have much of an effect on the open field system in Europe. France, for example, continued to evolve the open field system for agriculture in its most modernized regions. For example, the area of Quesnay is cited as one of the most technological advanced regions for agriculture, known as the land of 'high farming'. It became more and more advanced due to the collective management and self-governance of these open field systems. Other examples of open field system are cited throughout the world, such as Tigray in Ethiopia and Anatolia in Turkey in the 1950s. In fact, the open field system in Tigray had a mechanism to prevent any ox owners profiteering from oxless owners. Within the rules of the open field system, ox owners were coerced to prepare space or land for oxless owners before they were allowed to prepare their own. The oxless owners would then assist by supplying feed for the animals they use to plough the land as a return payment. It was a symbiotic relationship between the two groups of people, and it benefited everyone using the open field.

However, the open field system across Europe was under threat by many exogenous forces, the biggest one of which were wealthy landowners who wanted to privatize their land use. This process came to the forefront between the 14th and 17th centuries. Landowners wanted to convert arable land used for farming into open space to graze sheep. This conversion process raised a lot of issues for the ruling class about modalities of land use and access. The Statute of Merton, passed in 1235, allowed a Lord of the Manor to enclose common land, provided that there was enough pasture left for the tenants, and also clarified the conditions for his assertion of exclusive ownership rights over waste lands, woods, and pastures at the expense of tenants. The oldest statute of the English parliament, it formed the legal foundation for defining ownership (Pitkin, 1961). Three centuries later, following the suppression of the anti-enclosure Kett Rebellion of 1549, the Statute of Merton was revived in 1550 to allow landlords to enclose land at their own discretion. Enclosed lands were at that point set up to become eventually the norm throughout England.

1.2.2 The Agrarian Revolution and the Enclosures of the Commons

The process of this shift was slow, and the disappearance of commons was a rather gradual affair. The first forms of enclosure still provided for the overall collective management of the common land. So while the agricultural management of land was becoming enclosed, governance was collective. Farmers were granted ownership to allotments, which comprised long strips of land, often separated from each other to ensure no individual would receive better parcels than the others. Farms were placed next to each other so that each farmer could benefit from mutual aid by the other farmers. After harvest, many farmers allowed horses, cows and sheep to graze the field and deposit their manure as fertilizer for next year's crops, because they would glean the grain on soil before letting the livestock graze.

Even if farming was done on an individual basis, much of the decision-making around agricultural management was still done communally to ensure no farmer was left behind. An example of such communal decision-making involved communities setting a cap on the level of income per farmer that qualified for the use of common land. Some villages put income caps while others would set aside pasture land for the people. The income cap was set to avoid tensions between farmers who would imminently see this as a zero-sum competition and exploitation among each other. While

the parcels were placed in commonable land, collective arrangements in the management of that land were the norm throughout England. Christopher Rogers et al (2016) claimed that commonable land was a concept in which good neighborhoods and territories generate the sustainability of a resource, equitable access, a solid balance between conflicting demands, and guide for decision making tools on land use. It was a system that worked really well for farmers. These individual parcels were part of a greater common land regime, but they also marked the beginning of agricultural competition brought on by enclosure.

Enclosure started to get imposed on common governance when wealthier farmers came to dominate the councils and force the arrangement of assignment of land, which made land ownership increasingly unequal. By the start of the 18th century land distribution was no longer driven by social justice, but by proportionality based on property rights and ancient customs. In fact, leaseholders and manorial lords were at an advantage compared to the rest, because they had the resources and capital to invest in newly enclosed land. Less wealthy farms did not have such capital investment possibilities, so they held on to traditional forms of farming. This shift was the start of the enclosure of the commons in Agrarian Britain.

While distribution of land ownership was becoming increasingly based on enclosure by wealthier farmers, many socially oriented systems remained. For example, a support structure was established to help less wealthy farmers in what was becoming a fragile economy of small scale agriculture. Many among those not owning land ended up unable to farm and provide for themselves independently. Thus, they were forced to become hired workers at a larger scale farm. While these farmers could obtain another source of income, this arrangement was less secure than owning a parcel of land, and so the benefits of farming would be diminished. As enclosure of farmland was becoming the norm, farmers who once owned small parcels became laborers for the bigger farmers.

In addition, several innovations took place during this period. Crop rotation allowed different crops to be grown on the same parcel of land across different growing seasons. Fencing set boundaries to the parcel for protection of the crops' growth. Usage of harvesting equipment allowed each individual farmer to harvest more crops in a shorter amount of time. These innovations allowed

farmers to increase their productivity and ensure the protection of their agricultural land. But these innovations required capital investment, so farmers had to be more productive in order to achieve an outcome that could afford them these advancements. It was therefore important for each farmer to own land and make money directly from that land. The objective of such capital investment greatly motivated the enclosure of the commons.

It was also this form of capital investment that created a major divide in wealth between wealthier landlords and factory and farm workers. Farmers able to afford investing in these new forms of innovation for agriculture were typically also leaseholders or landlords who gave themselves in systematic fashion more power to impose enclosures of common grounds. The new forms of investments in farming innovations also led to the introduction of new crops, which required arable land to be properly drained and re-fertilized, a task that required a lot of time, cash, and effort. Many of these newly introduced crops were crops with roots. Ill-drained clays were too difficult and costly to cultivate such crops, one more reason to privatize the best-quality land.

The Agrarian Revolution was the period where farming shifted from common ownership and common use of pasturable land to enclosed and privately-owned spaces. As farming technology advanced in the wake of the 18th century, more efficient crops were being used and the usage of the crops would help farmers acquire cheap and effective drainage systems. Such efficient crop systems meant that the manorial courts had less regulating to do over time. This encouraged more enclosures of common lands, precisely because many of the farmers who acquired these new efficient fodder crops would decide amongst each other not to enforce common rights and physically enclose allotments for individual use and benefit. These new agreements of enclosure meant that the common lands were eventually transformed into spaces of unrestricted individual ownership.

Centuries of enclosure procedures in England unfolded along three distinctly different paths. Large-scale "informal" (i.e. non-parliamentary) enclosure on the commons involved primarily agreement among owners, excluding the peasants who used or lived on the land. In other words, enclosures were accepted under common consent between each owner, who agreed upon themselves to enclose larger portions of the fields or the commons, including any "waste" worth

cultivating. The land thus ended up divided into separate compound farms or allotments, based on proportions of quantity and value that each owner originally held. In order to get these agreements officially approved, commissioners appointed by the state had the responsibility of confirming each division of land, and therefore the enclosure of the commons, while also settling any disputes that may arise from such arrangements. This led to the abandonment of common rights, and farmers consequently stopped farming on the common land. This spreading practice of large-scale informal enclosure peaked between 1750 and 1760. As such, by 1760, most of the common lands in England had already been enclosed by landowners agreeing upon themselves to occupy these portions of common land. As a result, there was not much non-parliamentary enclosure taking place after 1760.

Another mode of informal enclosures arose from a dynamic known as 'piecemealing', a process that allowed the owners agreeing among themselves to occupy small portions of land from the commons and open fields for their own use. The land occupied in this fashion usually ranged between one and twenty acres. Barriers were formed near the boundaries of the newly privatized lands to ensure the owners could use the space under complete privacy and exclusivity, without any intervention from the public. This more gradual practice developed in response to conflicts that were arising with the first common-consent method described above. Piecemealing eventually took over as much as half of the cultivated land. But this growth of enclosed land was still in much smaller proportion so as to manage conflict arising from this process more easily.

And then there were the private enclosures known as encroachments, defined as large parcels of common land or waste being occupied without any approval or permission of the communities in the village. These encroachments received little opposition, because peasants could still demand a right to square on the waste or on the roadside and work for some form of compensation. If a cottage was resurrected overnight and had smoke coming from the chimney in the morning, the residents of that cottage were usually allowed to stay. This seemed to be an easier option than fighting for the common land. As farming opportunities were diminishing, opportunities of employment in a nearby town and local rural craft became more available providing landless peasants new forms of employment and self-dependence. These welcome alternatives emerging in

the later stages of the "informal" enclosure movement should not obscure the deeply destabilizing consequences of land enclosure for the rural population.

Spreading enclosures led to villages becoming depopulated and common lands surrounding these villages disappearing over time. Peasants were becoming increasingly unsettled, and their response was to revolt such as the Midland Rising of 1607. Peasants increasingly resisted the enclosure of the commons and became gradually better organized in combating that corrosive force reshaping rural England. Vigilante bands were created to cause even more impudent acts of resistance. In his masterful discussion of the enclosure movement as a "revolution of the rich against the poor," Karl Polanyi (1944, pp. 36 – 40) notes that the socially chaotic dislocations of unregulated enclosures had to be slowed down by legislative regulation of the process.

Under the Tudor and early Stuarts, spanning the late 16th and early 17th centuries, Parliament came to oversee the enclosure movement more and more. New enclosure agreements were at that point transformed into Acts of Parliament where specific individual ownership rights were enforced and landowners were protected. Thus, regulating the transformation towards a more orderly pace and legally established norms provided a degree of stability which encouraged new investments to improve crop yield and feed more people. This eventually led to an expansion of the population and new technological advances whereupon production and development grew exponentially. We can consider this period to be the beginning of the end for commons, coinciding with the rise of industrial capitalism.

By 1760, very few non-parliamentary enclosures persisted, because most the common land had already been enclosed by agreement at that point. Nonetheless, the English parliament passed a total of 5,265 private enclosure acts from 1750 to 1850 (Mingay, 1997). Of that total 3,094 acts, or 59%, were on open field or common land. These acts were performed to confirm the legal validity of an enclosure that had already persisted upon agreement. Another reason for these parliamentary acts of enclosure was to enclose the remaining camp of the open field land that had survived piecemeal enclosure. Yet another motivation for passing new enclosure acts was to solve or amend any errors or omissions that were committed in the preceding acts. With those three reasons explaining how parliamentary enclosure acts complemented the informal non-

parliamentary enclosure practices, it was clear that the overall goal was to enable the completion of enclosure of the land in England. Some scholars argued that non-parliamentary enclosure had a greater effect on England than the parliamentary enclosures that proceeded later. By 1760, when the parliamentary enclosure acts took off in earnest, well over 75% of England's land had already been enclosed informally.

If so much of the land had already been enclosed by private acts, why was there a need for the parliament to step in and pass nation-wide acts to support this enclosure process? It is true that the earlier phase enclosures taking place before 1790 were achieved fairly quickly. But as time passed, enclosures were getting seemingly more complicated. This was because these enclosures included provisions for commutations of tithes and schemes that focused on road improvements for the parish, which led to longer lasting proceedings. As a result, the first upsurge in interest in parliamentary enclosure began in the 1750s. Between 1730 and 1754 food prices were low, and as a result landowners had less pecuniary motive to endure the lengthy and troubling process of obtaining a private act to enclose. The average amount of enclosure acts was around four a year.

Between 1755 and 1770, however, there was a greater number of enclosure acts passing. England's rapid population growth during this period fueled an ever-expanding market for cropped goods. As such, food became a more profitable good, with higher rents on land incentivizing landowners to privatize their land and gain more profit from it. A decrease in parliamentary acts occurred from 1780 onward, because it became less profitable and more expensive to enclose. This was directly correlated to the land value decreasing. The introduction of the grain made prices lower, while at the same time there was a rise in interest rates. This made the cost of borrowing to finance an enclosure more expensive. Afterwards, due to the Napoleonic wars, interest rates were rising and food prices, primarily because of poor food harvests, were also on the rise. As a result, there was an upsurge in parliamentary acts again in the 1790s. The average number of acts passed reached seventy-five a year during 1790 and 1819. After the wars, the number of acts passed fell sharply to approximately forty-five a year between 1815 and 1819 and to a mere average of sixteen a year between 1820 and 1844.

There are three main reasons why initiators of enclosure persisted with the involvement of the parliamentary rather than their old non-parliamentary methods. The first reason was achieving greater legal certainty. There was much less of a chance for opponents of enclosure to win back their common lands when the parliament backed up the privatization of the land concerned. With commissioners completing the award, enclosures were much more easily accepted. The second reason was to confirm the necessary commutation of tithes and improvements of roads, which was much more easily achieved under the authority of a parliamentary enclosure act. The third reason was to lessen the opportunities for the opposition of enclosure to win their case.

1.2.3 The Death of the Commons in the Wake of Capitalism

By the end of the 19th century the commons had lost their role of dominance as an economic system destined to prosper the population. It was generally understood that enforced enclosure would help landowners obtain more wealth while at the same time improving food supplies for the rest of society. But for individuals to accumulate wealth through the exploitation of resources for profit was only possible by enforcing enclosure of common lands. This is mainly because property rights needed to be privatized so that producers of goods and services could sell their produce for individual profit. In the wake of capitalism's inexorable rise, centered on the profit motive and privatized property, the commons faced a natural death.

There is general agreement among historians that the commons have been sidelined by economic and political forces of capitalism. Many scholars (see sections 1.4.1 and 1.4.2) argue that commons had to be destroyed in order to accommodate economic prosperity associated with the spread of capitalism. In the 19th century, capitalism was defined by an ever-accelerating growth of heavy industries and mass scale production. Yet, while history shows a widespread destruction of commons in Europe and the United States preceding the Industrial Revolution, there is also ample evidence that, even when commons seemed invisible, they continued to exist here and there. Many underprivileged people still preserved the commons to obtain some form of support system that would keep necessary goods of survival in reach. In order to understand how commons have survived even at the forefront of capitalism and its enclosure, one has to look at the historical context of commons.

After a major period of enclosure leading to the diminishing of the commons in the 20th century, the commons have reemerged at the fore of economic thought. There are three main reasons for this reemergence. The first is because of the rapid increase in urbanization conglomerating more people together in denser areas amidst sharply worsening inequality. There is also an increasing concern of climate change having detrimental effects on people's lives. Finally, we live with the spreading realization that the current neoliberal paradigm of unfettered capitalism is unable to respond to these two aforementioned pressures. We aim here to explain these reasons for the reemergence of the commons movement in greater detail.

The first reason is the ever-accelerating growth of the world's population moving towards cities to find opportunities of employment and a higher quality of life. This movement of people towards the cities has existed for a while. While cities have been at the core of each empire in the history of humanity, it was the industrial revolution that brought masses of people into denser urban areas at a rate quicker than anything ever seen in history. The discovery of steel production and oil refinement brought a major period of development in many countries across the world, notably in Europe and the United States. This increased scale of development also came with an increased demand for labor, particularly in areas where mass scale development occurred. The industrial revolution came shortly after the start of the major enclosure period of the commons. The enclosure of the commons resulted in many farmers and subsistence users being forced out of their previous domicile and way of living. These people moved to cities to seek new economic opportunities. This led to a population shift, resulting from a grand exodus of people pouring into the cities and away from the countryside.

During this exodus, several economic changes complemented this population shift. Because there was an enormous upsurge in factory production, demand for labor increased exponentially as well. Many of the previous farmers found employment opportunities in these factories. In other words, these factories became the replacement of labor for these farmers, except that working conditions were far more gruesome for a pay that could barely sustain their lives.

In addition, there was an enormous population growth in recently industrialized countries. Many scholars have linked the population growth to a decline in the death rate, primarily because of an

increase in food sources and decline in warfare. By 1850, during the time of the enclosures, over half of the population in Britain had already found homes in cities. However, the living conditions in the cities were deplorable. Cities became overcrowded, filthy, and impoverished. The industrial workers were forced to live in dormitories where an individual room would lodge up to six people. Because of this overcrowding, diseases and epidemics spread quickly across the industrial working population. This was also a result of very poor sanitary conditions. At the time, city governments were too overwhelmed to deal with the increased population and were unprepared to respond to the sanitary conditions that came along with it. As such, there were disposal services available, and garbage was ubiquitous. In addition, many people would dispose of their waste by dumping sewage on the streets, leading to very poor hygiene. Some of the waste would end up in the cities' water systems. To conclude, living conditions were deplorable.

Conditions in factories also left much to be desired. Factory production required labor at a constant level, and the workers were forced to adjust to a routine they were absolutely not used to. Their agricultural backgrounds were comprised of routinized hours of work alternated with a rest schedule. When these workers were forced to break that habit in order to cater to the labor demands of the factory, their ability to rest was diminished. The factory owners, who were wealthy and hungry for profit, instituted very long and restless hours for the workers to ensure that they would maximize their profit from having factories producing continuously. Penalties were given to workers who were late or producing less than what was demanded.

In addition, the factories were dangerous, because there were no safety regulations or protection for these workers. Being surrounded by machinery and working with toxic gas or particulate matter, the risk of injury was enormous. Workers would not receive compensation if they were injured. And if you were in no condition to work, you would lose the possibility to earn or meet your needs. There was also no such thing as labor laws, and often enough workers would work twelve-to-sixteen hour shifts, working as much as seven days a week. Such a schedule was not only exhausting, it also led to very poor health conditions that could eventually threaten the ability for that worker to earn in the future. In addition, there was nothing stopping a factory owner to use child labor in order to meet profit demands.

In conclusion, there were several factors that contributed to the deterioration of worker and living condition for newly formed industrial workers. Since families were departing from a tradition of self-subsistence, there was a greater need for income generation. But that was no easy task for a family when the woman was expected to stay home and care for the children. This was already the starting point for gender discrimination, and many women suffered from this. In addition, in order for the families to support themselves, some children just barely old enough to work were also forced to find employment in these factories. This led to an increase in child labor and made for a dangerous and treacherous upbringing. The bad working conditions of industrial workers came from a greater population in need of jobs. Since there was such an abundant supply of workers desperately looking for employment, the workers were often cornered into accepting a wage that was far less than the bare minimum. This also led to a deterioration in living standards. The large population shift unto cities led to overexploitation, and eventually a depletion of the cities' potable water sources. It also put overwhelming pressure on city governments, as they were forced to deal with poor hygiene and trash everywhere. Evidently, the government system was too strained to keep up with the growing demands of a rapidly urbanizing population.

The immediate effect of the government's inability to provide the necessary public services to this increased population was pollution. More waste was produced as factories were producing at an ever-accelerating rate. Furthermore, there was also an immediate division of classes as people were scrambling to gain income that would barely support their needs. It was evident that the industrial and factory workers were separated by living conditions, working environment, and income. With all of these problems bearing down on this largely impoverished population, it was clear that change was needed. Labor unions were formed as a remedy for the pain inflicted onto these industrial workers. Since workers were often getting mistreated, labor unions came together to help workers improve their conditions and strengthen their protections. But it was still not enough to lift the quality of lifestyle and the working conditions of these workers. Workers also formed cooperatives to secure necessities at reasonable prices and rules of fair distribution based on need. These indications of workers responding to their misery by resisting exploitation led eventually to improvements through collective bargaining, labor laws, and self-governing cooperatives. To the extent that capitalism's tendencies towards excess can also materialize as over-exploitation of resources, it would not take long for commons as a form of collective management of common

resource pools prioritizing their long-term sustainability to find potential applications for their eventual revival over the last quarter of century.

Section 1.3 Capitalist Logic versus Commons as Social Experiment

We will revisit these attempts at resistance to capitalist excess later in this chapter, when resuming our discussion of capitalism's contradictions as root causes for social movement responses, with the help of Polanyi's (1944) conceptual framework, notably his concept of "double movement." In the meantime, however, we must recognize that capitalism also carries an ideological project in defense of self-interest and the profit motive. From this point of view defenders of the capitalist market logic will inevitably cast doubt on any social movement striving to go beyond. Here we must in particular point to two apologists, Mançur Olson's critique of "collective action," and Garett Hardin's notion of the "tragedy of the commons."

1.3.1 Mancur Olson and the Logic of Collective Action

Mancur Olson's contribution rests on his critique of collective action, implying the presupposed dominance of self-interest in shaping human behavior. His principal work is *The Logic of Collective Action: Public Goods and the Theory of Groups* (1965). There, Olson develops his argument against collective action in connection with public goods. A public good or collective good is a good possessing two key characteristics. For one, it is non-excludable, meaning that everyone has a right to the use of that good without any form of exclusion. Moreover, it is non-rivalrous, meaning that a user consuming that good cannot affect another user's consumption of that good and vice versa (Samuelson, 1954).

Commons fall under this category of a collective good. Olson (1965) claims that commons managed under collective action efforts by groups of people are, like all other public or collective goods, subject to the "free-rider problem." He defines this social phenomenon as a process in which members of a group deliberately provide less or participate less than what is required of them to achieve a common goal. Thus, individuals join a group to gain for themselves without

being a part of the collective initiative. The result of free riding is an insufficient production or provision of the good, leading to the eventual degradation of that good.

Olson (1965) provides a basis for his criticism of collective action by highlighting several key points which illustrate the complications and challenges individuals face when they are obliged to make decisions collectively in pursuit of obtaining a common good. His main argument is that individuals will not voluntarily contribute enough to the pursuit of the collective interest unless they get a direct benefit from their participation. In a smaller group it may be easier to match the collective interest with the personal interest of its members. But when the group concerned is larger and personal benefit from collective action thus more diluted, there is likely a propensity for "free riders" to take advantage of others by not doing their fair share while drawing benefits from the group effort like everybody else.

When groups grow in size, so do the costs associated with the organization and maintenance of the common good. As said before, and this is after all at the heart of the dominant (neo-liberal) ideology, people are assumed to be rational and self-interested individuals. If there is no clearly laid out opportunity that benefits each member of the group collectively, individuals will choose to act in their own self-interest rather than for the common good and group interest (M. Olson, 1965, p. 2). It is thus likely that people will pull out of a group when the collective effort needed to be a part of the decision making of a group becomes too costly, or when individuals cannot envision the full value of participation in order to obtain that collective good. When such a dynamic takes place, making decisions as a group becomes too difficult, and the collective pursuit of the common good becomes increasingly less attractive.

The second reason why collective action might not work in today's economy according to Mancur Olson is how difficult it is to get self-interested individuals to participate in a collective dynamic. In many instances, individuals are competing with one another for that good, so that the participation required in pursuing collective action is threatened by conflict that might arise from the competition of pursuing the same good. It should also be said that such competition within a group pursuing collective action results in members only participating for the possibility of receiving benefits. This demotivates self-interested individuals from putting in the work to agree

on decisions together as a collective. And the lower share of benefits incentivizes group members to participate even less over time. This undermines the aggregate effort of a group in obtaining any common good. Olson highlights this point by saying "The larger the group, the farther it will fall short of providing an optimal amount of a collective good" (ibid. p. 35). This claim becomes stronger when considering the rise of organizational costs associated with growing size of the group which may lead to further inefficiency in obtaining a collective good.

Collective action may not work when costs rise to make decisions. As each individual uses cost/benefit calculations to determine their level of participation, it is likely that they will not see the value in engaging collectively with others because the costs are higher than the benefits. As such, they will opt out of being a part of any decision-making process. Companies pursue their interests through lobbying and political pay-offs, and so long as this behavior exists, it will be very hard for individuals to act collectively. Under Olson's theory, it is difficult to justify the need for collective action efforts to solve socio-economic problems and pursue a collective good.

1.3.2 Garrett Hardin and the Tragedy of the Commons

Olson's critique of collective action can easily be extended to the theory of the commons. The purpose behind the notion of the commons, after all, is initiating collective action among individuals sharing the same interest and potentially forming a group. In that context individuals collectively agree upon decisions in order to pursue a collective interest. For that interest to gain greater value for an individual, the decisions are agreed upon collectively. However, some decisions that are made collectively are difficult, and Olson debunks collective action by claiming that such collective forms of decision-making are either very costly to the individual or impossible to make as a group.

Garrett Hardin (1968) takes Olson's criticism of collective action to the next level by explaining how individual actors will find it difficult, if not altogether impossible, to use commons in pursuit of a collective good. Given capitalism's rule of private property and profit motive, driven by self-interested actors, commonly owned resources are not compatible with the standard dynamics of economic growth. In such a context, any commonly owned resource is bound to be subject to

eventual decay. This is especially true when you take into account that the world has a finite stock of natural resources, has a growing human population, and human nature is guided by self-interest. These factors together threaten the possibility of obtaining a collective good in a commonly managed space. Hardin even claims that commons often lead to further problems of social and economic injustice.

In a world where economic actors act in their own self-interest, it is considered nearly impossible to manage a commonly owned resource. Hardin (1968) has explained why by providing an example of a pastured land used for cattle ranching. Each cattle rancher owns his or her own cattle in a land owned and managed by a group of farmers competing against each other. Assuming, as we are prone to do in economics, that everyone is rational and will act in their own self-interest in order to maximize the benefits available from a resource, Hardin begins his illustration with the notion that a cattle rancher is well aware of the financial benefits he receives from each cattle he owns. The rancher is also aware that the cost of using the land to raise the cattle is not his financial responsibility. The land has a limited amount of space and is shared between a group of competing cattle ranchers. Each rancher is trying to own as much cattle as possible without the incentive of investing in the land. As a result, the ranchers maximize the amount of cattle they can possibly afford to achieve maximum personal gain without considering the physical constraints of the shared land. Under these circumstances the amount of cattle far exceeds the maximum capacity the land can hold, thereby subjecting the land to considerable physical strain.

On top of that, there is no governing body to control the amount of cattle there are. No cattle rancher would want to bear the cost of managing the land, which means that these ranchers run the risk of overexploiting the land and eventually degrading it. Such neglectful attitude toward the management of the land, along with the increase of cattle within a limited space, further exacerbates its degradation. But because each rancher wants to own more and more cattle, the rate of degradation runs the risk of accelerating exponentially.

In Hardin's example the likelihood of destruction taking place in a commonly shared land is extremely high, and it is thus not favorable to initiate a common property ownership scheme with regards to natural resources. This 'tragedy' reaches a macro-level as well when taking into account

the problem of over-population in this world. Overexploitation of commonly owned land is worsened by continuing population growth in a limited biosphere. This claim implies that commonly held property with more and more common 'owners' using the land shall only deepen the level of damage.

Building on Hardin's work, several influential scholars (Coase, 1960; Brazel, 1989; Eggertsson, 1990) have suggested that private property rights are the most efficient way of managing natural resources, assuming that the owner has the rational interest to maintain the land properly and avoid overexploitation to his or her own benefit. This argument has become the mainstream neo-classical approach, often invoked to explain capitalism's success in the United States and several other developed countries. But several scholars, such as Libecap (1989) and above all North (1990), have offered historical accounts that challenge the neoclassical view of a foreseeable evolution of economically efficient property rights. These scholars state that private property rights grant ownership only to a small portion of the population, undermining the rights and even the welfare of a vast majority of the population. The ability to own, exploit at free will, and sell a resource gives dominant power to the owner, and this creates social and economic imbalances. In addition, there is no way to force an owner to stop over-exploiting or abusing a resource, and the environmental harm resulting from such practice can prove to be incredibly costly to society. Such claims have forced many scholars to rethink the implementation of communal property rights that define commons today.

1.3.3 Elinor Ostrom's Response

Ostrom (1990) is one of the scholars who has rejected Hardin's argument by providing many examples of successful schemes of commonly held resources being properly managed by a group of users. But she notes that the success of a 'commons' depends on collective action by users to formulate a set of informal norms and rules that every user can abide by. In order for successful commons and the collective action within them to be explored properly, it is important to provide the analytical framework for common property rights.

According to Schlager and Ostrom (1992), common property rights to a resource pool involve property owned by a community of multiple resource users working together to maintain and manage the resource. These property rights are classified and organized in a hierarchical structure, from authorized user to claimant to proprietor to owner, with each having their own set of rights to access and use the resource (see section 1.1.2). While there is a formal hierarchal structure as to who has the rights to use the land, there is an informal institutional set of arrangements regarding how the rights are established. Such institutional arrangements are derived from a de-facto property rights system, which is based on resource use and put into place by individual users who are not officially recognized by government bodies (Schlager and Ostrom, 1992).

De-facto rights are different from de-jure rights which governments impose with legal force explicitly granting rights to specific individual resource users. This implies that any conflicts concerning the property rights can be settled in a judicial setting. In common property right regimes there are several instances where de-facto property rights work in conjunction with de-jure property rights established by the government. For example, governments may not have the means to enforce rules fully and sanction those that break them in which case de-jure rights might be set up to define ground rules. Resource users can then appropriate de-facto rights on the basis of these ground rules (Alston 2009). Such de-facto rights could serve as mechanisms to protect a natural resource.

The establishment of de-facto rights is particularly relevant to commons, because they create the motivation to initiate collective choice rights designed to implicate all resource users. In this case de-facto rights can become a particularly powerful tool when governments pay little attention to the resource, giving all resource users the opportunity to gain autonomy and define rules and operational rights among themselves. With workable arrangements in mind, collective de-facto property rights set up within a common property rights system can lead to efficiency in using and maintaining a resource. However, such institutional arrangements require collective action in the management of the resource and creation of de-facto property rights linked to the use of that resource (Schlager & Ostrom 1992). The more people participate in the development of such de-facto property rights, the greater the credibility of these rights within the use of the resource. While Mancur Olson's critique of collective action may apply here and there, the whole point of Schlager

and Ostrom's elaboration of institutional arrangements is to assure that they provide a workable system of rules and norms guiding users guiding users how best to manage and preserve a resource sustainably.

Ostrom's timely response to the critiques of Mancur Olson and Garrit Hardin in defense of collective action and commons must be put into a broader context. Commons are part of a social tradition of humans organizing together for shared objectives outside and beyond pure market logic. It would be useful to place Ostrom's contribution in the context of a wider response to capitalist domination. Let us consider for that purpose the meaningful contribution of Karl Polanyi's (1944) critique of capitalism and his analysis of social movements using collective action in response to that system's excesses.

Section 1.4 Polanyi's "Double Movement" and the "Social Solidarity Economy"

This historical analysis on Karl Polanyi's interpretation of market capture to social systems and processes will pinpoint us towards the origins of how collective action was used as a confronting measure against capitalistic logic. Such an analysis will also provide commons an entry point in economics. It will also help us obtain our objective of introducing counterbalancing measures against this marketization process of common goods.

1.4.1 The World According to Karl Polanyi

Karl Polanyi, developing in his classic *The Great Transformation* (1944) an original critique of what he termed "market society," provides a powerful answer to all those apologists who, like Mancur Olson or Garett Hardin, presume the capitalist logic of individual self-interest and private property rights to be the only acceptable framework of social behavior. From their vantage point it is not surprising to conclude that collective action is difficult to make succeed or that commons will not work. Their very starting point of self-interested rationality and individual optimization presumes anti-social choices bound to undermine any alternative social form of organization rooted in the collective or the community. Hence their conclusions about the futility of collective action, as in the case of Olson, or the tragedy of the commons, as argued by Hardin, are predetermined by their starting assumptions about human nature.

The beauty of Polanyi's (1944) counter-argument is that he takes a far more complex, dynamic and ultimately social view of human nature to analyze the pros and cons of capitalism. He basically views humans as interacting within their social and natural environments in order to make a living by adapting to their material conditions and the environment they face. Avoiding the kind of class analysis proposed by Karl Marx, Polanyi instead highlights the tension between economic progress and social dislocation. He develops this tension early on in his book, in the aforementioned passage on enclosures in medieval England (see section 1.2.2) at the beginning of chapter 4 which he entitled "Habitation versus Improvement." Humans strive for economic progress, and that is "improvement," but they also need stability in accessing the life's necessities and roots to a place of their own making, and that is "habitation."

In that same discussion of enclosures Polanyi (1944, pp. 36 - 40) also makes the point that the development of the markets, with their supposed self-regulation, goes hand in hand with the growth of the nation-state, having to intervene more actively to help markets do what they are supposed to do. For example, England's parliamentary enclosure acts of the 18th and early 19th century were much motivated by the need to slow down the process, thus have a better chance to adjust to its dislocations, and also resolve conflicts more effectively. He makes the same argument about the interconnection between the "market system" and the "nation state" when discussing the Industrial Revolution and the Poor Laws. If he is correct in arguing that market regulation can only operate effectively with the administrative, protective, and regulatory help from the state, then the frequently evoked dichotomy between "market" and "state", or "private" versus "public," may in reality be far more complex than we all have been led to believe by economists and other social scientists defending the "free" market.

Another key concept which Polanyi (1944, ch. 6)) develops is that of the "double movement" where the dominant paradigm of economic liberalism, all the way to its more recent neo-liberal push for deregulation and privatization shaping the period from the early 1980s to the crisis of 2007/08, has to be counter-balanced by social protection mitigating the excesses arising from such relentless marketization. A good example for the latter is the Keynesian Revolution of the 1930s, as expressed in Roosevelt's New Deal. But such "social protection" is not necessarily state-led

only. Polanyi's emphasis on social relations guiding economic activity allows for all kinds of inter-group and intra-group formations whereby humans seek to shield themselves from the vicissitudes of capitalism or pursue goals together they deem socially beneficial. This, of course, leaves space for the formation of commons as a way to manage socially valuable natural or human-made resources of all kinds as common-pool resources.

Justifications for commons may arise also from another angle of Polanyi's analysis of capitalism. Looking at the "market system" and its relentless drive for marketization, pretty much everything which profit-seeking actors can get their hands on gets subjected to the market logic of demand, supply, and market price including at least a normal profit, if not an extra profit. Polanyi (1944, ch. 6) makes the crucially important point about what he called the "fictitious commodities," the marketization of land, labor, and money none of which should be a commodity at all given their respective qualities and strategic significance. Going back to the enclosures of common land which led to its "commodification" as private property, Polanyi stresses the profound societal destabilization of that process as illustration. Taking his point about the embedding of economic activity in social relations and those playing out in the environment, we can see commons as an alternative non-capitalist formation for bringing land, labor, and money together.

In sum, Polanyi's *The Great Transformation* makes several key arguments why we need to reduce the influence of capitalism if we are to respond to the social and environmental crises of our time. Firstly, he argues that all societies must provide adequately for their members to meet their basic needs, which include food, health, education, housing and more. While pre-capitalist societies carried out this obligation through cooperation and norms of social responsibility, the rise of capitalism has imposed the market mechanism as source of discriminatory inequality, reserving adequate provisioning only for those able to pay the price. Secondly, Polanyi sees the market mechanism crowding out other social mechanisms which, on their own, would be better able to shield people from economic stress and deprivation. The environment is a perfect case in point. Rather than nurturing a symbiotic relationship with nature aimed at its preservation for our comfort and enjoyment (including sustainable farming, for example), we have commercialized the environment to the point of perpetually destroying natural processes that have taken many generations to nourish. Thirdly, the market mechanism utilizes powerful ideological justification

for its hold on people's lives, such as forcing most of us through exploitative labor markets for survival and making it appear as if this was the only possible way to organize the creation and distribution of income. Yet in reality, and this is another point often highlighted in Polanyi's discussion of capitalism, the "market system" is prone to crisis and conflict. It thus ends up often needing state intervention to prevent it from getting consumed by its own contradictions. And its propensity for excess, even violence, prompts human counter-reactions of resistance which can reach transformative force. All four points of Polanyi's analysis of capitalism bear thinking today, after decades of neo-liberal prescriptions for unfettered market regulation having brought us to the brink of environmental catastrophe and, as the pandemic has so powerfully illustrated, subject to a myriad of inequalities.

1.4.2 The Social Solidarity Economy Through the Lens of Polanyi's "Double Movement"

Looking at the dominating forces of capitalism and anti-capitalist counter-movements through the lens of Polanyi, we can historically analyze what happened when the Industrial Revolution pushed industrial workers and other oppressed groups to the brink. Using Polanyi's dynamic notion of "double movement," we can identify preliminary forms of collective action in the form of social movements confronting capitalism's worst excesses. Already at that point, during the Industrial Revolution, you get a first manifestation of these counter-balancing forces implied by the double-movement notion in the form of worker cooperatives which emerged in England and rose to prominence during the early 19th century.

Worker cooperatives helped workers forge a collective association within their industries to counter the negative forces brought by capitalism. They were owned by the employees themselves who consequently were responsible for mobilization of financial resources as well as collective management of the governance. When it came to the governance of cooperatives, responsibilities included strategic, operational decision-making, with managers collectively appointed by members. The ownership of assets was formed by the individual investments brought by the members to reach a common pool of financial resources (Paranque and Willmot, 1997). Such assets were joined with other sources of finance such as grants or loans. While this form of

common capital provided no dividend distributions, the surplus value was used to improve the wages of employee members and help create better working environments. Common capital investments would thus create reserves, thereby making sure that cooperatives would meet their membership needs. In addition, the cooperatives often engaged directly with the market without having to go through a 'middleman' for market information.

These forms of cooperatives have evolved not only in employee ownership, but also in other domains. Consumer cooperatives, for example, provided access opportunities for home consumer goods. Housing cooperatives led the struggle for social housing. Farmer cooperatives allowed ecologically-minded farmers to distribute high-quality food to poorer communities known as "food deserts" where the predominance of unhealthy processed-food products of major agrobusinesses charging high prices leaves too many people with no choice but to eat badly. All these examples show that cooperatives have managed to integrate themselves from their very inception two centuries ago in key domains and sectors where communities have engaged in some kind of struggle for acquisition of better resources and fairer administration

You can look at those cooperatives as part of a broader movement aimed at reaching sustainable social and economic justice. As such, cooperatives bring to bear important notions of social organization which according to De Peuter and Dyer-Witheford (2000) consist of associated labor, workplace democracy, surplus distribution, and cooperation among cooperatives. Associated labor refers to team-work by a unified work force within a collectively organized workplace whose principles of self-organization motivate higher levels of productivity than would be expected just from the accumulation of capital alone. Workplace democracy allows members to govern the cooperative's operation on the basis of collective decision-making, with members exercising their rights to have a say on how the cooperative will be governed. Surplus distribution from the accumulation of common capital mobilized by the members of the cooperative occurs equitably in proportion to the contributions individuals made to the generation of that surplus. Finally, cooperatives will want to work together with other cooperatives and even organizations that do not follow the same model of governance as part of a broader counter-movement against the domination of capitalism.

Even though cooperatives date back to the origins of industrial capitalism, there has been a revival of them since the 1960s. Today they form part of an emerging framework for all kinds of forms of collective self-organization often referred to as the "Social and Solidarity Economy" (SSE). This concept started with a notion called the "social economy," defined as the collective governance of self-organized groups providing welfare provisions that the state could not provide due to capitalist capture or government inefficiencies (Desroche, 1976). In recent decades, the "social economy" has added a dimension of "solidarity" involving different kinds of governance schemes rooted in solidarity-based organization and collective action such as fair-trade initiatives, community currencies, and forms of peer-to-peer sharing such as crowdfunding.

Set apart from the dominant model of the market economy and its profit motive, SSE organizations and activities are both theoretical model and social movement rooted in collective action pursuing broader values of societal well-being (Sahakian. 2016). One of the priorities of SSE has been to expand self-organized governance schemes so as to enlarge institutional diversity (Nyssens and Petrela 2015). Hence the SSE comprises today a wide range of organizational formations all of whom share in common their dedication to rebalance social, economic and environmental objectives away from the profit motive. They include non-governmental organizations (NGOs), community organizations, mutual associations, social enterprises, possibly even "public benefit" companies or for-profit "certified B corporations" if we allow our definition of SSE to cast a wider net. What makes each of these formations part of the SSE is their pursuit of explicitly nonprofit motives and reliance on collective action. The many different kinds of self-organized collectives making up the SSE that "spaces of deliberation" and "collectively decided rules or democratic mechanisms" instituting forms of self-governance that promote domestic logic, redistribution, and reciprocity (Eynaud and Laville 2019).

Cooperatives are at the heart of the SSE, not least because of their deep historical roots dating to the origins of industrial capitalism. They also have come in a large variety of applications, whether as workers' cooperatives as a form of social enterprise, farmer cooperatives to secure food supplies, or consumer cooperatives to assure affordable access to necessities, just to name a few. The central position of cooperatives is also justified by a history of organizational principles guiding their modus operandi which got formulated first as the so-called "Rochdale Principles"

already in 1844 by an early consumer cooperative considered a pioneer in founding the modern cooperative movement known as the Rochdale Society of Equitable Pioneers. They were formalized in 1937 when the International Cooperative Alliance (ICA) officially adopted them, later revising and refining them on two occasions, in 1966 and most recently in 1995 when they were incorporated into a broader "Statement on the Co-operative Identity." These updated ICA Principles, which may be regarded as generally valid operational goals for all kinds of self-organized collectives making up the SSE, can be summarized as follows:

1. Voluntary and open membership, including anti-discrimination commitments and acceptance of a variety of motivations and rewards as valid.
2. Democratic member control.
3. Member economic participation, including provisions for common capital control, member compensation and appropriate use of surpluses.
4. Autonomy and independence.
5. Education, training, and information.
6. Cooperation among cooperatives.
7. Concern for community.

While the SSE carries very promising potential for great diversity in organizational and institutional formations of collective self-governance, its relatively limited spread up to date points to a need for more innovation in that regard. We could, for example, argue that commons governing the mobilization and preservation of common-pool resources by a community should be included in the SSE as one of its key vectors of expansion. To elaborate that argument further, let us briefly revisit the aforementioned eight design principles proposed by Ostrom (1990) to guide commons. Those principles, as already first pointed out in section 1.1.2, are:

1. Define clear group boundaries.
2. Match rules governing the use of common goods to local needs and conditions.
3. Ensure that those affected by the rules can participate in modifying the rules.
4. Make sure that the rule-making rights of community members are respected by outside authorities.

5. Develop a system carried out by community members for monitoring members' behavior.

6. Use graduated sanctions for rule violators.

7. Provide accessible, low-cost means for dispute resolution.

8. Build responsibility for governing the common resource in nested tiers from the lowest level up to the entire interconnected system.

If we compare these principles for commons with the ICA principals for cooperatives, we can easily see substantial overlaps between the two sets of rules, especially if and when we pair relevant provisions from each set with each other and offer appropriate interpretations for context, as I have tried to do elsewhere (see Guttmann, 2018; Guttmann, 2020). But cooperatives and commons are not only guided by several similar principles which they more or less both share in common. They may have such complementarity that they can actually be put meaningfully together in a variety of commons-cooperatives configurations, as I have discussed in terms of concrete case studies elsewhere (Guttmann, 2018; Guttmann 2020; see also section 2.5 below).

Section 1.5 The Case for Commons beyond Natural Resources

More generally, the ability of commons to boost the SSE is rooted in their flexibility which has allowed for a growing range of applications. Over the last couple of decades, we have come to appreciate that there are more and more situations calling for commons as solution, provided we keep an open mind about what we can consider to be actually or potentially a common-pool resource. Thus, a case can be made in favor of conceiving of commons as relevant organizational solutions for a variety of situations going increasingly beyond their traditional concern with the management of natural resources, as used to be the case thirty years ago during Ostrom's time when commons were typically applied to fisheries or forests and so forth.

1.5.1 Charlotte Hess' Reconceptualization of the Commons

Charlotte Hess (2008) shows how the theoretical framework of commons found in Ostrom (1990) can be applied to a much wider array of applications. There are all kinds of shared resources we

can conceive as commons provided we stop insisting on pre-existing rules or clearly delineated institutional arrangements as necessary prerequisites. In other words, if we bring a more open mind to what we think commons must do or can be, we shall find that there are a lot more situations where they make sense. For example, new kinds of resources may evolve as commons, because these are now capable of addressing issues such as degradation, sustainability, and social conflict. Implied here is the possibility of reinstituting commons in new sectors such as scientific knowledge, voluntary associations, climate change, community gardens, internet platforms, cultural treasures, plant seeds, and others. In analyzing commons in these sectors, Hess (2008) stressed several new settings for a more broadly applicable commons.

Hess' first entry point concerns the need to protect shared resources that are threatened by enclosure, privatization, and commodification which decrease accessibility of a particular resource. Today, in the Information Age spawning knowledge-intense services and fast-paced technological change, we can adapt the notion of enclosure to patents and other intellectual property rights restricting access to new knowledge and then argue in favor of using commons to assure broad access to innovations and their wide diffusion. Such knowledge commons may also make good sense in the scientific domain where people are encouraged to create areas of free access and inquiry through standardized licenses ensuring open accessibility of scientific data. Such open access to scientific data can more easily foster mass online collaboration, as we have witnesses for example with Wikipedia, Free/Libre and Open Source Software (FLOSS), the public library of science, and other experiments of voluntary participation for shared outcomes.

Of course, emphasis on open access, which after all implies non-excludability, raises the possibility of having free riders who are acting in pure self-interest, as Hardin (1968) implied with his "tragedy of the commons." But many examples of new commons of the open-access type show that, if people do communicate with one another over the shared governance of a resource, they will end up more likely acting for the common good of that resource. This finding, emphasized by Hess (2008), points to the importance of access rules and participatory management of implementing these rules are needed to govern a shared resource successfully.

Hess (2008) also emphasized the importance of using commons as a tool of civic education in light of the fact that today's official education systems suffer from structural problems, whether overcrowding and underfunding for public education or restricted access based on discriminatory criteria, including cost, for private education. Whether provided by the state or the market, many people suffer from not having access or using an educational system that does not cater to their needs. In the face of such disparities commons can provide better access to education and raise its quality, both improvements which may prompt implementing commons-like policies in educational reform.

Traditionally speaking, commons have always been defined by massive pools of natural resources, such as forests, grazing, land tenure, and wildlife. However, Steed and Fisher (2007) have claimed that such notions derived from the traditional theory of the commons can be adapted to new commons we have never thought of before. For example, we can associate commons with roads, policing, sports, sidewalks, and other public sector services. Hess (2008) suggested to redefine the commons beyond referring only to large pools of natural resources and extend the notion also to neighborhoods, infrastructure, knowledge, academics, education, and global commons. The latter in particular depends on the capacity of the world's population to rediscover the commons. Such rediscovery may be made easier when realizing that wealth, rather than just denoting how much money an individual has, can instead be completely redefined in terms of the conditions of access we have collectively to common resource pools. We can then systematically push for such commons to be implemented across many different sectors, rooted in an expansive notion of what we consider needed resources we would like to pool together and share equitably among ourselves on the basis of agreed rules.

1.5.2 The Argument for Urban Commons

One of Charlotte Hess' (2008) most promising extensions of commons was their application in cities. She specifically labeled commons in cities as neighborhood commons, pointing in the process to homeowner's associations, community gardens, streets, and parks as potential commons in cities. Her analysis in mapping commons in this specific sector has opened up a whole new sub-theory of commons, known as urban commons.

What is interesting but at the same time challenging for theoreticians of urban commons is to figure out how much they share in common with the natural-resource commons studied by Ostrom and what, if anything, makes them different from those traditional commons and hence unique. Foster and Iaione (2016), pioneers in launching the theory of urban commons, point out that cities are not only very dense, diverse, and highly used, but also congested and highly regulated. There are important physical aspects of cities to take into consideration when exploring how community-based self-governance might work best in managing urban commons implanted in cities. To the extent that urban commons are non-rivalrous but somewhat excludable, issues of over-exploitation of the kind highlighted by Hardin's (1968) "tragedy of the commons" are still relevant in urban commons. That has prompted critiques of their potential, as for example Lee and Webster (2006) or Fennell (2015). These authors have also stressed that urban commons may prove fragile in the face of social tensions and conflict among demographically diverse groups typically found in cities. While we can respond theoretically to such pessimistic assessments of the viability of urban commons very much like Ostrom responded to Hardin, we also need to remember that urban commons, just as natural resource commons, would typically emerge out of a political and economic struggle triggered by the marketization of commonable resources at the fore of capitalist logic, thereby nourish solidarity among diverse groups, and also get strengthened further by their integration within the broader context of SSE as a societally transformative force borne out of struggle.

Applying Coriat's (2015) definition of commons to the urban setting and adapting it to specific common pool resources existing in cities, we can look more specifically how Ostrom's (1990) eight design principles of a commons-based governance structure might play out in cities and would have to be adapted to develop specifically urban commons. The first aspect to consider here relates to the inexhaustibility and renewability of resources in an urban infrastructure. Natural resources are subject to exhaustibility when they are overused and poorly managed by their users, and such common pool regimes may fail in achieving sustainability when natural resources are threatened by such abuse – the whole point of Hardin's critique of commons in his *Tragedy of the Commons*. But these constraints do not apply to the same degree in an urban setting where resources we might consider commons have different traits than natural resource commons. Urban

resources such as squares, parks, abandoned buildings, vacant lots, and streets can be repurposed for a multitude of uses and functions by their users. They are renewable throughout their life cycle, remain flexible in usability and durability, and are thus far less exhaustible than natural resources would typically be.

We must note here the constructed aspect of cities and their urban commons. Whereas natural resource commons grow or are found naturally, commons in cities are constructed and therefore put in place with social processes and institutional designs in mind. This changes the governance of urban commons completely. While users of natural resource commons have to apply measures of sustainability to manage their commons, users of urban commons produce their own measures to determine the usability of the resource. Urban commoners are therefore involved in a collaborative process of engaging a diverse pool of stakeholders to participate in the co-design and co-production of urban commons. These actions, which historian Peter Linebaugh (2008) has referred to as "commoning," are a critical element of self-governance in the context of urban commons and profoundly shaped by the scale of the city, neighborhood, or block.

Thirdly, cities are rooted in laws and politics. As a result, commons that are produced in such spaces must exist within highly developed regulatory frameworks. In many cases commons must have the ability to confront the laws and politics that exist already, especially since the creation of urban commons requires modifying the regulations of administrative branches that are responsible for the management of private and public property. Such rules may change to allow and protect collaborative forms of resource management. Therefore, the self-governance in urban commons must go through phases of legal experimentation. Charters can be an example of such practices, as we shall explore further below in this thesis (see chapter 3).

Cities exhibit a great deal of demographic complexity and diversity in terms of their inhabitants' ethnicity, social class, and interests. This reality makes self-governance more challenging for commons found in cities than natural resource commons. Because cities represent such diverse populations, politics is often complex as economic tensions and social conflicts transpire at a much higher rate. Therefore, active participation in commoning and in the construction of urban commons is intrinsically difficult. The collectivity of self-governance regimes cannot just consider

the community around urban commons, but must take into account the city as a whole. As Foster and Iaione (2016) phrased it, a shared nested governance involving the whole city must be built around the conglomerate of urban commons formed throughout a city, which means that the cooperation and involvement with many other urban actors must be considered.

Connecting urban commons spanning the city makes for a polycentric configuration (Flynn, 2018). Polycentrism is defined by cooperation among several diverse actors to pool and manage resources collaboratively. Typically, such actors would include social innovators, public authorities, businesses, civil society organizations, knowledge institutions, and urban residents. The idea of a polycentric governance theme for urban commons is to pool a variety of resources that may be either environmental, cultural, knowledge-based, and digital, co-managed under contractual and institutionalized partnerships between public, private, and community-based sectors. Thus, management of urban commons would be neither exclusively owned nor centrally regulated so that communities have more leverage over how urban resources are managed.

Another crucial concept at the heart of urban commons, besides polycentrism, is the notion of horizontal subsidiarity which provides a legal, even constitutional, basis for citizen action in the broadest sense. Subsidiarity is obviously a crucial concept of administrative guidance for policy-making, especially in the context of the European Union as a historically unprecedented experiment in supra-national governance (Mulé and Walzenbach, 2019). The EU's constitutional treaties, such as the Maastricht Treaty of the European Union (1992) or the Lisbon Reform Treaty (2007), provide explicitly for "subsidiarity" inasmuch as they require policy to be carried out at the lowest administrative level of government possible which, depending on the policy area concerned, could be the federal, national, regional or provincial, departmental, or municipal level (Breton, Cassone, Fraschini, 1998). This is what we mean by vertical subsidiarity. But there is another kind of subsidiarity, the horizontal one, which implies that government should leave space for citizens, and their representative intermediaries, to govern their own affairs wherever that is possible. Such horizontal subsidiarity provides essentially a progressive platform for active citizen engagement and formation of civil society organizations operating beyond the market logic of capitalism and alongside local government.

One of the more interesting recent social experiments illustrating the relevance of horizontal subsidiarity has been taking place in Bologna, Italy, in connection with the 2001 reform of the Italian constitution whose article 118 (4) introduces the principle of horizontal subsidiarity as follows: "State, regions, metropolitan cities, provinces and municipalities support autonomous initiatives promoted by citizens, individually or in associations, in order to carry out activities of general interest; this is based on the principle of subsidiarity." Recognizing that this provision of the new constitution asks local administrations not just to govern on behalf of citizens but also together with citizens in such a way as to harness their energy, skills, talents, and ideas for collaborative governance projects aimed at improving the life of a community, the municipal administration of Bologna launched a pilot project centered on three urban commons known as the "City as a Commons" project in June 2012 (Feola, 2014). Two years later, in May 2014, Bologna's city council, after assessing the pilot project's progress and potential, passed the "Regulation on Collaboration Between Citizens and the City for the Care and Regeneration of the Urban Commons" (http://www.comune.bo.it/media/files/bolognaregulation.pdf), a model for structuring the collaborative governance schemes involving the launch and management of urban commons now being considered for adoption in other Italian cities (e.g. Rome, Florence, Genoa).

Urban commons, such as Bologna's "City as a Commons" project as well as many others we shall discuss subsequently, are a unique recent extension of the commons. With these themes and concepts placed together, we can point to the notion that an entire city can be a commons as well. For example, cities are made up of several types of spaces or structures that are saturated by government neglect or market-driven enclosures. They may also be contested by several groups of people condensed together in a fight to occupy those spaces. Therefore, urban commons have the capacity to assemble wide-ranging groups of strangers together in order to win back that space against capitalist logic (Huron 2015). Stavrides (2016) confirms that a city can be a commons to the extent that it is a site with strong regulation, capital production and surplus, and contestation of resources. A city can thus easily become a brewing ground for several different types of urban commons, from immaterial to physical, and from cultural to ecological. Urban commons can range from housing, urban infrastructure, urban natural or economic resources, public areas, labor, public services (Dellenbaugh et al. 2015). As we delve into a deep analysis on urban commons, we have to respect that the broader concept of urban commons takes many different forms, and specialists

in the field must recognize that several different interdisciplinary perspectives are needed to understand urban commons. Their relevance and complexities are worth analyzing in greater detail as we shall set out to do in the next chapter.

Section 1.6 Concluding the Chapter

This chapter provides a general overview on the theory of commons. By explaining its origins, its periods of enclosure, and its theoretical resurgence, this chapter shows how commons have become increasingly relevant following Ostrom's (1990) path-breaking contribution. Ostrom's subsequent cooperation with Charlotte Hess opened the way for Hess' (2008) crucial extension of the commons' applicability to new sectors. She thus sets the ground for introducing urban commons formally at the end of the chapter. We can now proceed to the next chapter, which focuses on identifying types of urban commons and applying them to the general theory of commons. Chapter 2 will explore these theoretical notions in greater detail in light of the climate change crisis.

Chapter 2 – Urban Commons as Ecological Enablers of an Economy

In this chapter, we are exploring the applicability of urban commons as a force in guiding how cities might want to organize themselves during the first half of the 21st century. Whether integrated into an emerging Social and Solidarity Economy (SSE) as part of a transformative socio-economic force moving us beyond the inadequacies of a state-versus-market dichotomy or just composed of stand-alone projects with a rather narrower scope, urban commons could play a useful role in helping cities deal with their growing set of challenges bearing upon them these days. We do not need a global pandemic, such as Covid-19, to remind us how fragile city life can be and how rapidly urban living conditions can change in drastic fashion. Covid-19 has also been a warning how exposed urban dwellers are to environmental effects, a reminder we shall have to take seriously in the face of imminent destabilization of the urban space by climate change. This challenge, we believe, renders urban commons especially relevant as a potential organizational strategy in our struggle with nature, and that is the theme we wish to explore in this chapter.

Section 2.1 highlights the difference between common pool resources in cities, which Benkler (2005) defines as "open commons," and urban commons with similar governance structures as natural resource commons presented by Ostrom (1990). Such a comparison mirrors the difference between CPRs and commons explained in this first section of chapter 1. This comparative analysis allows us to identify the key principles of urban commons, which may differ a bit from those principles explained by Ostrom for natural resource commons. Since the governance structure is essential for an urban CPR to become a commons, section 2.1 introduces the notion of "commoning" as a key vector to create and secure these governance structures. From commoning to urban commons, it is clear that these social processes can help cities face their challenges and make them become more resilient to climate change. Therefore, the end of section 2.1 explains city challenges, and how the ecological transition to a zero-carbon economy will become a major priority.

Presenting urban commons as policy tools for the ecological transition, section 2.2 highlights the key aspects of urban commons that make them viable policy tools for cities to adopt in the context of the ecological transition. Here we also illustrate how municipalities can support urban commons

and use them to embolden communities who seek to achieve an ecological transition in their urban neighborhoods.

In order to make our argument of urban commons as a highly relevant force against the impact of climate change on urban centers credible, two things will have to happen. The first concerns the very relevance of urban commons. Right now, they are still a rather marginal phenomenon, happening here and there in this or that city. Even though still quite rare, deeper analyses of concrete urban commons experiments, such as the "Cities as a Commons" project in Bologna we mentioned at the end of chapter 1, will help us establish their potential as meaningful vector of collective action. Still, urban commons will only find the kind of broader application they need for their evolution into a major force, if they fit into the political agenda of cities and address challenges faced by policy-makers and activist citizens. We shall argue in section 2.3 that they do.

The other thing we need in support of our main hypothesis is that, among the various types of urban commons we can classify, there are some which can provide ecological services, broadly defined and adapted to the environmental challenges of the first half of the 21st century, to help cities adapt to climate change. We conclude section 2.3 identifying the various forms of urban commons found in cities, which are specific to achieving the ecological transition.

Section 2.4 will present a typology of urban commons showing which ones are particularly relevant to the ecological transition. This takes the form of a matrix categorizing all the types of identifiable urban commons, which will help this thesis pinpoint which urban commons respond to climate change crises most effectively. Our classification system introduces a potentially strategic category of ecological commons.

Section 2.5 will specify what makes urban commons 'ecological' in the first place. The notion of 'created ecosystem services' shows how urban commons can make cities more supportive to biospheres that need conservation and growth in order to achieve the ecological transition. As vectors of transition-promoting ecosystem services urban commons can be organized as community-based tools for the ecological transition.

But such urban commons need to fit somehow into the broader economy for them to be as effective as possible. Section 2.6 will clarify that question by showing that urban commons can support cooperatives in their public benefit business models. More broadly, we illustrate here how urban commons become part of the Social and Solidarity Economy, a vector that makes them more economically effective in cities focused on the ecological transition. This will be argued through the lens of a commons-cooperative alliance, a notion illustrated in section 2.6 as the key vector for turning urban commons into potential SSE pillars. Examples of such commons-cooperative alliances will show that urban commons as economic tools for facing climate change are possible and exist already. That brief discussion concludes chapter 2's analysis of theoretical applications of urban commons as key tools for cities facing climate change crises.

Section 2.1 – How Urban Commons fit into the Political Agenda of Cities

While we have yet to see urban commons install themselves on a large scale as a major force of societal transformation in how we organize strategic spaces and functions of cities, they have a lot of potential to serve precisely as such a force. City government and local business will find that in a number of instances there are resources best managed by the communities concerned themselves who depend on that resource. For urban commons to realize their potential, they will have to fit into the political agenda of cities so that social forces mobilize their creation and preserve their status over time. This requires recognition of their unique role in contradistinction to common pool resources and open commons (section 2.1.1), their structuring on the basis of widely recognized principles specifically applying to urban commons (section 2.1.2), the strategic role of "commoning" activity in the life of urban commons (section 2.1.3), the problems faced by cities worldwide which urban commons may help to address (section 2.1.4), and how in particular urban commons may help cities prepare for climate change and adapt to it (section 2.1.5).

2.1.1. Common Pool Resources, Open Commons, and Urban Commons

We have quite a bit of literature about common-pool resources in natural areas, especially with regard to property rights and management systems. But when it comes to cities, literature on

common-pool resources is lacking by comparison. In order to distinguish urban commons from urban common-pool resources, we can look at a few thinkers. For example, Stavrides (2012) and Foster (2016) have both begun to reflect on how urban CPRs are defined and compared with commons. They both seek to define urban CPRs as spaces subject to overexploitation and misuse. Yet those same urban CPRs also often tend to have the distinct feature of being spaces of interaction between several groups of people with different ethnic, economic and social backgrounds. Spaces of interaction can also be spaces of innovation. So having a stricter definition of urban CPRs is necessary not only to distinguish them from urban commons, but also for better managing them in the future to realize their potential more easily.

The notion of combining urban spaces and resources with CPRs is in tune with Benkler's (2013) definition of "open commons" which he also tends to view as subject to overexploitation and misuse. Because of the similarities these two theoretical approaches bring, we have a clearer path in defining what urban CPRs really are and how urban commons diverge from that notion. To identify what urban CPRs really are, it is helpful to make use of Benkler's (2013) open-commons notion. Benkler moves away from the idea that CPRs primarily take the form of pastures or irrigation districts which is how we used to conceptualize CPRs for over a century. Instead, he argues, modern economies contain new forms of open commons based on highways, sidewalks, squares, and utilities such as electricity, water, sewage, and power, none of whom contain a classic model of property rights and free market exchange. But they are integral to the development of cities, facilitating new economic exchanges between people and creating new possibilities for innovation that shape how we go about our lives.

In essence, we are committing to a two-step procedure. First, we go back to the original distinction between the original notion of CPRs as applied to natural resources and the commons as characterized by Ostrom's design principles. This will make it easier for us to highlight the difference between a CPR as a natural resource and an urban CPR as a space for social interaction in an urban setting. Second, these distinctions can then be extended to discussing how urban CPRs differ from urban commons in the context of cities, not unlike how Ostrom (1990) did when she highlighted the difference between CPRs and natural resource commons.

As mentioned in the previous chapter, a CPR is a natural resource that has a host of users using or exploiting that resource. But management of that resource is ungovernable, to the extent that there is no way of instituting effectively enforceable rules and regulations. For illustration, think of a lake that has several individual fishermen. In the absence of any regulatory constraint, these fishermen will surely be inclined to fish as much as possible so that they can each earn as much profit as possible. Eventually such profit-driven behavior will cause the lake to have its stock of fish supplies more and more depleted because of overfishing. In conclusion, a CPR does not contain effective regulatory restraints to increase the lifespan of the resource. In fact, the opposite is typically the case. A CPR is thus not necessarily governable as a result of which it may well become subject to overexploitation or overuse, eventually facing degradation and destruction. It is precisely in that context that Garrett Hardin's (1968) idea of "the tragedy of the commons" has taken root.

Such CPRs surely exist also in cities where certain spaces or resources are shared by a host of users, but are unregulated, hence ungovernable, and therefore subject to the same type of tragedy as an overused natural CPR. Foster (2016) identifies some unregulated CPRs in urban contexts where the same type of tragedy as denoted in Hardin (1968) can be seen. She refers in this context to open urban land that is not part of a managed system regulating land access and usage within the community. Such open spaces are subject to an unrestrained flow of squatters who want to use the land freely for whatever purpose, even if whatever use they opt for does not fit the sustainability of that area. Brownfield toxic sites, for example, where anyone can dump toxic materials without facing the consequences of their pollution, are one such manifestation of intrinsically harmful unregulated urban CPRs. Sicotte (2016) discusses one such example, the huge housing project Altgeld Gardens on Chicago's impoverished and troubled South Side also popularly referred to as "urban donut" for representing the highest concentration of hazardous waste sites (combining 50 landfills and 384 industrial facilities), whose huge accumulation of toxins have exposed nearby populations to the point of causing severe cases of illness and congenital anomalies (e.g. birth defects).

In addition to unregulated open land like the toxic urban dumping sites, informal housing settlements also fall into this category of unregulated urban CPRs. Those exist in the developed

world as much as in the developing world. Such informal housing settlements may be a part of an unincorporated urban area where poorer people occupy the land for their own constructed shelters. The favelas in Rio de Janeiro (Brazil) or the slums adjacent to the airport of Mumbai (India) are key examples of large informal housing settlements lacking any regulation or surveillance. Those CPRs are often on the fringe of growing cities, lack certain key services, and deprive residents typically of access to electricity or water. They often attract crime and impose extremely difficult living conditions on poorer residents, especially since local authorities lack the will or ability to provide basic services in those marginalized areas. Such urban slums, found in many urbanized parts of the world, pose a health and safety risk to the communities crowding together in those informal housing settlements and to the neighboring communities around them.

Abandoned neighborhoods in economically depressed cities like Detroit can also fall into this category of unregulated CPRs, especially since some residents still stuck in those gradually de-populating areas are not provided the benefit of proper building codes, so that they often live in areas with improperly paved roads or unsafe houses subject to infestation and decay. We have here another manifestation of a "tragedy of urban commons," to the extent that such unregulated CPRs in the form of informal housing settlements dotting the peripheries of mega-cities in the Southern Hemisphere's become a threat to the development and sustainability of the city surrounding them.

For other cities, such as New York and Paris, urban land is becoming increasingly scarce due to the overdevelopment and overuse of available spaces. As so much urban land is being consumed, questions get raised about how urban land should be developed to avoid unsustainable use. For example, streets and other spaces are at risk of becoming congested. In some cases, horrific traffic patterns in squares and streets may cause seriously harmful accidents. It may also cause some of the infrastructure holding these spaces to degrade or even collapse, as is the case with the Brooklyn Queens Expressway in New York, a highway that is on the verge of collapse due to overuse. Such spaces open to everyone and consequently threatened by degradation are in many instances seeing tighter regulation of their use and accessibility, as for instance with zoning regulations regulating relevant land use issues such as building shapes, affordable housing standards, or climate change resiliency benchmarks. Theoretically, these spaces do not have the same features as natural-

resource CPRs, especially once put under a regulatory framework that limits dangers of congestion and over-exploitative practices.

This is where we get into the framework of regulated urban CPRs. Their accessibility remains open, but comes with regulations that are enforced by an over-encompassing governing body. There is now a set of rules and regulations to control their use and so avoid what we labelled as the "tragedy of urban commons," a term coined in Foster (2016). According to Benkler (2013), open commons abstain from exercising any form of restrictive private property rights, thereby avoiding the allocation of asymmetric rights to exclude, use, and manage. Instead, open commons provide symmetric access and use privileges for an open class of potential users. A good example of such an open commons is a highway, which cannot be restricted to a limited set of users and instead offers open access to anyone whose capacity to drive meets the requirements demanded by the government. While avoiding exclusionary proprietary control to make way for symmetrically defined access and use privilege, those regulated urban CPR resources are still prone to uncertainty due to the open access they offer to anyone.

Even when there are strictly defined and enforced regulations imposed on these open commons, they still cannot be defined as commons in the same way Ostrom presented her definition and applied her design principles of commons. Ostrom's commons are on a much smaller scale in terms of production and governance. Ostrom's commons are also more collectively coordinated among users, who share the tasks of developing an effective governance structure capable of assuring their sustainability. As Benkler (2013) put it, such commons have the necessary governance structures and tools in place to manage provisioning, congestion, and disinvestment, relying on collectively decided and enforced rules which tend to be developed through local practices and institutional frameworks organized by communities. Regulated open commons deserve their own theoretical framework in the debate of what constitutes a commons, not least also in terms of how they differ from a CPR.

Several resources fall under the theoretical order of open commons in cities, such as sidewalks, roads, plazas, public squares, waterways, shipping lanes, sewers, urban infrastructure, electricity and telecommunication networks. The vast variety of resources constituting 'open commons' has

even sparked debate as to whether we can label a whole city as a commons. After all, cities are regulated municipal structures with zoning laws that help regulate and control development. The debate of labelling a city as a commons was sparked by Stavrides (2012). That author used the Lefebvrian notion of a city (Lefebvre 1968) to understand how a city is not only a publicly managed space or a commodity but also a space of collective action and communal sharing, features that replicate the forms of commoning seen in commons themselves. A lot of rules, say on how to use a park or how to organize a protest on a square, remain informal so that such a debate is not irrelevant. And what makes up the fabric of the city are the abovementioned open-access resources themselves, which after all precisely those leading to unplanned informal interactions and organizing among people. This all contributes to a city's economic development.

While a city as a commons remains a theoretical framework relevant to open commons and CPRs, there is a need to pinpoint specific resources themselves that are part of the broader framework of "urban CPRs." The resources mentioned before all fit into the theoretical framework of an open commons because they are open to everyone rather than just to a limited set of users. The users of these open commons are highly diverse, unknown to each other, and all relying on the open commons resource to commit to their routines. That being said, there is an existing governance defined by a set of rules of use typically enforced top-down by a city government. Yet those rules do not guarantee the prevention of congestion, pollution, and degradation or neglect. Their openness makes them subject to the aforementioned "tragedies". Such open commons are particularly focused on cities, where they are needed for the city to thrive, grow, and create economic opportunity.

But perhaps the defining set of rules also makes these open commons more sustainable in the long run than the CPRs we find in the natural resource sector, and that highlights the key difference between CPRs and open commons. CPRs contain no rules, but they are defined by their infinite extraction and use rights which allow anyone to exploit them without any control over the natural resource. The absence of any regulatory restraints leaves them exposed to highly exploitative behaviors. By contrast, open commons have a necessary shield to avoid such an exposure. When Garrett Hardin was talking about the "tragedy of the commons" he was precisely referring to CPRs for which there was not any regulation or rules pertaining to the use of that shared resource.

Therefore, the fundamental difference lies upon the regulatory framework that protects both of these open-access resources. Urban resources are still subject to overuse and misuse by their users, so it is not least for that reason also important to keep a strong link between what a CPR is and what an open commons is. Both are still subject to the "tragedy" that Hardin refers to. I therefore think it makes sense to refer to open commons as CPRs linked to urban areas, and hence using the open commons framework to define what an urban CPR is. An urban CPR can contain most of the elements of the CPR in situations where there is a top-down governing body (aka city government) that sets up rules and regulations of use. Therefore, we can use the open-commons theory of Benkler (2013) to define urban CPRs.

Urban CPRs are fully open, meaning they are non-excludable so that anyone can use them and exploit them to their advantage. But certain rules must be followed. Some users of urban CPRs abuse the resource through damaging and harmful actions, like criminality and vandalism. And yet the regulatory framework and fabric of the rule enforcement apparatus applied to these urban CPRs can miss such negative actions often enough. While some users can get away with such actions in an urban CPR, there are still rules in place which dissuade users from abusing the resource. If you are caught doing a crime to or in the resource, you have to face fines and consequences defined by the imposed regulation. Such a regulatory framework is good enough to limit such actions of crime, vandalism, and overall degradation of the space or resource.

While open commons like streets and squares are fully open and non-excludable, there are some overseen rules enforced by a governing body to follow. Sidewalks, sewers, infrastructure, transportation are all examples of this. The governing rules of urban CPRs do not necessarily stop new innovations or human behaviors from disrupting the flow and use of these urban CPRs, precisely because of their openness. A case in point is when electric scooters were introduced to the market, thanks to the institutional fabric of sidewalks (an urban CPR). As people were buying these electric scooters, rules and regulations for urban CPRs were not yet adapted to this new innovation. People were thus scootering on sidewalks and causing accidents which harmed people and property. Eventually, new rules were introduced to prevent scooters from going onto the sidewalks. However, this new regulation still remains questionable due to the nature of the open CPR being somewhat ungovernable with even these city regulations in place. This example

confirms our argument in favor of defining the urban CPR in connection with the open-commons format described by Benkler (2013) as applied to, say, sidewalks and squares.

It is therefore clear that urban CPRs share the same issues as a regular CPR. For example, if too many users are using the urban CPR either through volume or intensity, that urban CPR becomes congested and eventually degraded. Some poorly regulated urban CPRs are also subject to regulatory slippage by the government, especially as some cities like Detroit are known for having spaces that have been neglected for years. One urban CPR often falling victim to regulatory slippage is a brownfield site. While there may be zoning laws aimed at preventing the brownfield site from getting mishandled, it may still be subject to regulatory slippage and hence eventual decline. When spaces get fully abandoned, they easily become a brewing ground for dangerous activity. Therefore, we must insist setting urban commons apart from urban CPRs possibly subject to such neglect or abandonment. Urban commons aim to avoid Hardin's (1968) "tragedy." They have the means necessary to avoid overuse, bad practice, and non-sustainability. My thesis thus seeks to distinguish urban CPRs from urban commons, much like Elinor Ostrom did in distinguishing commons from CPRs in response to Garett Hardin's paper. This distinction is a key argument I wish to make when developing my arguments in favor of developing urban commons for the sustainable use of certain spaces in cities.

Urban commons are spaces that may have been considered under the original urban CPR definition, were it not for communities governing them having come up with humanly created rules that impose a certain level of exclusion for those who do not follow them. These rules are meant to guarantee the sustainability of the urban commons. Those humanly created rules, much like the eight design principles of Ostrom, render urban CPRs into commons inasmuch as they are needed for the sustainability and wellbeing of a community as a whole. Those rules, which must be tailored to the needs and practices of the commoners they serve if they are to succeed, typically organize forms of collective action aimed at avoiding scenarios of overexploitation.

The success of urban commons achieving sustainability through a set of humanly created rules rests on the idea that there is no asymmetric power in the governance structure, notwithstanding the rigidity of the rules. Those rules are symmetric when it comes to access, use, extraction, and

management. In this fashion, a diverse set of users can access the urban commons and operate within the constraints, as long as the humanly created rules are complied with or dealt with in a collective and communal way. And just like Ostrom's commons, they are managed on a much smaller scale, with a more manageable pool of users who know how to work with each other to set up the rules and enforce them adequately. This is how urban commons become sustainable in practice and avoid "tragedy," as they pull away from the notion of urban CPRs.

To conclude, resources may originally fall under the institutional fabric of CPRs. Some of them become commons, transforming certain spaces as resources that are sustainable. This is in part due to people who create these humanly designed rules with the objective of depending on that resource. The rules are not anymore top down, but created by the communities themselves as a bottom-up approach. A once ungovernable resource now falls under the rules of the community who knows the resource best. A level of excludability is applied to prevent overexploitation or misuse which open commons or urban CPRs are typically subject to. This quality of long-term preservation on the basis of symmetric rules for access and use is at the forefront of what urban commons really are, and that is why they deserve greater attention for helping cities manage their resources sustainably.

My characterization here of urban commons as distinguished by humanly created rules assuring sustainability applies obviously to already existing resources which we have collective interest in preserving and thus wish to shield from degradation by unrestrained and/or asymmetric use. And there are, as we shall see shortly below (in section 2.3), a good number of existing city-based resources, like a green space or an empty building, which can in this fashion be turned into urban commons, like a community garden or an occupied building serving as community center. But as we move the scope of commons beyond Ostrom's focus on natural resources (see section 1.5), we can also conceive of newly created resources being created from scratch as commons, where their very existence as a commons makes the resource unique and needed as such. This already starts with Hess' knowledge commons, which are implicitly created from scratch as collectively generated and communally diffused public knowledge. What makes, for example, Wikipedia unique as a knowledge commons is that it is neither commodified for profit by intellectual property rights (such as copyrights) nor diluted to the point of trivia from open-source excess, but instead

follows rather precise rules of elaboration, modification and propagation for a community of users. It is its creation and recreation as a commons that makes Wikipedia a valuable resource so distinct from other sources of knowledge. We can presume that this aspect of resource creation as commons may also very well apply to other areas where we are looking for a third way of social organization and economic activity beyond the juxtaposition of market and state. This includes new urban commons aiding the self-organization of cities in the interest of its residents.

2.1.2. Principles of Urban Commons

We have already argued briefly near the end of chapter 1 (in section 1.5.2) that the context of the city itself, with its unique complexities, renders the self-governance of urban commons more challenging. The urban communities responsible for self-governing their shared resources should be the main drivers of the governing process, but such an endeavor is more difficult than with shared natural resources, especially when considering the involvement with the state and the market. While Foster and Iaione (2016) highlight the changes and modifications of Ostrom's design principles and bundle of rights needed so that they can be properly adapted to the framework of urban commons, it was Iaione (2010) who first introduced five modified or additional principles derived from Ostrom's groundbreaking work applying to urban commons.

The first principle is the notion of collective governance which, beyond referring to a shared resource managed by a community, stresses the multiplicity of stakeholders which may involve a variety of actors outside the community. In this context, the main organizers of urban commons typically end up collaborating with many other types of urban actors, including owners of private land, municipalities, and non-governmental organizations.

The second principle is the distinct role of the state when it comes to the management of urban commons. In cities, the state often plays a pivotal role as facilitator in the creation of urban commons. Representatives of the state can protect this creation process by using sets of *de jure* rules applying throughout the city to support collective action arrangements for managing the urban commons and rendering them sustainable. They can also recognize the *de facto* rights which

allow commoners to organize their self-governance to fit their needs and objectives. A state enabler can serve as a strong facilitator for this dimension of self-governance.

The third principle relates to the nature of social and resource pooling, which can come in a variety of different forms through cooperation and co-production. The presence of such resource pooling, no matter what form it takes within the institutional framework of an urban area, allows different urban economic actors, particularly inhabitants and civil organizations, to be included in the management and ownership of several essential resources in cities. The idea is to incorporate a diverse set of actors in cities to collaborate and engage in a broad and diverse range of actions which ideally should serve the totality of the urban population affected.

The fourth principle is the notion of experimentalism, which is defined by actions taken by stakeholders to design and test legal processes of governance within urban commons. This notion must be considered adaptable to different contexts and institutional frameworks. It must also be considered as replicable by other commoners so that such legal processes can be tested in iteration. This principle is what allows commons to become resilient and robust over time as they make their presence better known.

The fifth principle is the incorporation of technology, particularly open platforms, to have citizens acquire greater rights of justice. Digital infrastructure and open data protocols are not only major providers of knowledge and information transfer, but they also allow a greater pool of urban citizens to be a part of the democratic and decision-making processes particularly with regards to shared urban resources. In other words, technology can be an essential driver of collaboration for the creation of urban commons. Open access to these processes empowers the very stakeholders that are in charge of governing the urban commons, and it must be considered as part of the commoning process.

When we put these principles derived from Iaione (2010) together, it gets easier to identify the forms of self-governance taking place around the creation and management of urban commons, and we can therefore highlight some of these key themes. The identified themes in this context are

governance in the form of polycentricism, peer production, and forms of collective action that give the public a greater role in the decision making of urban commons' governance.

2.1.3. Commons as Social Process: "Commoning"

Valérie Fournier (2013) invites us to understand the commons as a social process, including production and distribution relationships that are formed according to the logic of cooperation, solidarity and reciprocity. She introduces in this context the crucial notion of "commoning" which the historian Peter Linebaugh's (2008) has defined as a "recurring process" through which commons are produced by the individual and collective use of resources, work and knowledge. As a social process involving commoners in the creation and preservation of commons, commoning involves several distinct facets. One concerns the testing and approval of several governance schemes that commoners identify and use to render their commons successful in their specific context. Another relates to the spread of knowledge about what commoners used or did to render the commons successful, thereby feeding into a network system that fortifies the commons movement as a whole. In this context commoning can be seen to be a form of network creation for the commons and an avenue for communication among peers who consider themselves commoners. In addition, commoning also involves initiating a relationship with the municipality that will recognize the commons as a proper space and function for the city. Commoning may help municipalities further support the commoners and allow them to produce and govern the commons on their own.

To understand how commoning might work in the context of urban commons, it is important to analyze the theory behind commoning. This is a rather complicated term to grasp, not least because it is so new. Different scholars have also played with the term in a variety of ways. Acksel et al. (2015), for example, define commoning as a social practice by which institutionalized, legal, and infrastructural arrangements are birthed by extended relationships, shared solutions and collective activities. These social practices are often voluntarily and inclusively self-organized (Meretz 2014a). These activities are often mediated and rehearsed so as to constantly find solutions to reach common ground and achieve a common goal (Euler 2016). Scholars like Quilligan (2012) describe commoning as actions of common expression and coproduction of resources that are done

autonomously from any superior authority, and in a decentralized self-governed manner. These actions are what therefore allow commons to be autonomous as well.

Some scholars like Benkler (2006), DeAngelis and Harvie (2014), Bauwens and Jandric (2021) extend the notion of commoning to peer production, where individuals are identifyied as peers who are loosely connected, but cooperate and coproduce in a digitally networked environment. This confirms the idea that online platforms become spaces of P2P commoning. Such activities of social practice that appear in the P2P world also become conducive to how communities relate to each other in certain urban neighborhoods, spaces, and resources (Mattei and Quarta 2015). Therefore, scholars like Stavrides (2015) Bresnihan and Byrne (2015) and Smorto (2016) define "Urban Commoning" as a complex mesh of activities devoted to coproduction of urban resources, occupation of buildings to make them better, collective well-being of communities, and the coproduction of vital resources. Such activities of practice make cities therefore perfect hubs for commoning and the constant development of commons.

To put it generally, commoning is a process in which experiments are made by commoners. Such experiments evolve around the idea of self-provisioning and forms of production within and around commons. These experiments are constantly tested and modified so that commoners can learn and benefit from the process of commoning. Experiments can be based on collective appropriation of land, co-production and co-creation of goods and knowledge, communal decision-making within a group of commoners, and organization and different modes of governance within and around the commons. Experimentation of that kind covers a broad range of engagements, making the notion of commoning rather complicated to theorize.

Taking all these perspectives together, it is difficult to define what commoning really is in one take, precisely because it is a very pluralistic term used to explain where commons come from and how commons develop. But since commoning is central to how urban commons are presented in this thesis, one scholar's take on commoning becomes adequate in reflecting what commoning means for urban commons. Georgetown's Sheila Foster, whose "Collaborative City" platform (www.collaborative.city) reports on the results of hers and others' research on urban commons in what that group of researcher-activists (including C. Iaione) has termed the "Co-Cities Project".

She has also helped us clarify the complex notion of "commoning," even extending her platform in that direction (see commoning.city).

This project represents how commoning takes place in online platforms as peers gather together to share information about specific problems and solutions of cities and urban spaces. Those actions are also centered around the notion of urban care and the well-being of urban communities through urban commons. Foster and Iaione (2019) state that commoning comprises of shared norms, networks of trust, and voluntary cooperation that are developed by the relationship humans have with physical resources and communities, a phenomenon that especially is prevalent in cities where diverse communities and collective needs mix together. Through these foundations, urban commons form.

This intake on commoning parallels closely to the methodological research and the results I will present in Chapters 3 and 4 of this thesis, where online platforms and various 'recorded' social techniques are central to my methodology. Therefore, Foster and Iaione (2019) definition is most suited to present my argument and research of this thesis. Seeking to integrate the vast diversity of different commoning exercises into one grounded theory as presented in the "Co-Cities Protocol" (http://labgov.city/wp-content/uploads/sites/19/Co-Cities-Protocol-.pdf), Foster and her "Co-Cities" collaborators (e.g. C. Iaione, M. Bauwens) identify six phases in which commoning manifests itself in the process of creating and protecting urban commons: cheap talking, mapping, practicing, prototyping, testing, and modeling.

The first phase on cheap-talking is a term used to describe people getting to know each other and sounding each other out for common projects through goals and skills that individuals may possess and use to reach a common objective. After the initial cheap-talking phase collecting information informally about the problems to be addressed and identifying potential actors that might be recruited in the collaborative project, commoners map out potential urban commons. Various information-gathering techniques will have to be mobilized for that "mapping" purpose, including surveys and interviews, collection of ethnographic data, and active field observations, to analyze the specific urban context in question in its demographic, socio-economic, and juridico-political dimensions without which one cannot design appropriate governance mechanisms when finally

launching the urban commons. Such preparatory work of exploration might also involve setting up a digital platform as collaborative tool for engaging the community and disseminating relevant information. The practicing phase brings together collaborative actors, including residents, social innovators, NGOs, and knowledge-based institutions, into co-working sessions to explore synergies among themselves as a group, fit those with the commons to be created, and establish productive relationships with the local authorities for support. This work then leads to the setting up of the governance mechanism (in the prototyping phase) which will have to be tested for performance by being subjected to quantitative and qualitative evaluation methods. In the final modeling phase the emerging urban commons has to be contextualized into the local ecosystem by fitting it with existing regulations and administrative practices which may have to be adjusted, upon consultation with relevant policy-makers. Ideally, the resulting urban commons is so well developed and adapted that it can be replicated and hence bears relevance for other projects.

Commoning, as a verb, points to activity closely related to commons. It captures the social process of their creation and preservation through a network of relationships among dedicated actors of different stripes committed to helping each other and sharing things "that belong to all of us." (Ristau, 2011). Commoning adapts the resource in question to local conditions, while also looking for the replicability of commons elsewhere. Commoning is thus very much also to be understood in connection to our aforementioned discussion of "horizontal subsidiarity" which provides space for citizen action to meet societal needs and partake in the development of civil society. It is ultimately the social force which assures the viability of commons in many possible applications and their integration as a key propellant force in the Social and Solidarity Economy.

2.1.4 Challenges of the Cities

If we want to make a convincing case for today's relevance of urban commons, we have to relate them to the kinds of challenges cities typically face today. Once those challenges are identified, we can then try to figure out what kinds of resources would best help address those problems effectively. A growing array of socially useful, sharable and collectively elaborated resources may be best brought forth as urban commons rather than through the marketplace or the state, especially if such commonable goods or services are rooted in bottom-up social activism of interested parties

willing and able to find tangible solutions to their problems together. Since urbanization has dramatically accelerated across the globe in recent decades, cities have become ever-important spaces of economic activity. At the same time, structural change (e.g. from manufacturing to services) has greatly impacted on how they are organized, a fact of which we have once again been reminded by the impact of the pandemic (and the post-pandemic recovery).

2.1.4.1 Urbanization and Urban Sprawl

Ever since the early 1950s cities have had to deal with ever accelerating rates of urbanization. For example, Ritchie and Roser (2018) use various reports from the UN and World Bank to show that by 2050, 68% of the world population will live in urban areas, accounting for a total 7 billion urban residents by that year. That is a 20% increase from the percentage of the world living in cities today. That increase, coupled with the fact that similar reports predict that the world population will increase by over 2 billion people in that projected time, demonstrates how much of a strain this will put on cities in the future. Extremely dense areas of cities are extremely hard to manage and demand enormous amounts of resources, and this urban growth rate will only add on to the problems of congestion and pollution we see today.

In addition, there is also the issue of urban sprawl, which is the notion that cities will spread in geographical coverage and take up more hectares of land than before (Harvey and Clark 1965). As cities need more facilities for housing, recreation, commercial, and industrial land uses, development has increasingly spread beyond what were once drawn as the city's limits. Such urban sprawl may not be just the result of population growth, but may also result from poor public policy decisions, lack of investment in key public goods such as public transit, or changes in lifestyle preferences that demand a more suburban lifestyle.

The relentless spread of urban agglomeration is not only damaging to cities themselves but to bioregions as a whole, because urban sprawl causes increased pollution, traffic congestion, environmental degradation, depletion of biodiversity, and a decreased quality of life for those who live in or around cities. Urban sprawl also requires bringing infrastructure to less densely and more isolated areas, a costly exercise. Increased expenses and time for commuting add to inefficiency.

All this undermines the economic viability and social cohesion of cities, making them less governable and less livable (Zhang, 2015).

2.1.4.2 Clashes between a rising poverty and increased gentrification

There are also several trends showing that along with the overall increase in the rate of urban growth, there is an increasing rate of poverty in cities as well, and this trend is particularly noticeable in developing and underdeveloped countries. For example, the estimated urban share of the poor living with less than a dollar day had increased from 19% in 1993 to 25 % in 2002 (Chen and Ravallion 2007). For many of those residents, living on a dollar a day is detrimental. Urban areas have generally higher prices for goods and services than in rural areas, so urban residents are often pressured to have higher cash incomes to satisfy their needs Beall and Fox 2011).

Some studies show increasing rates of urbanization and higher prices for basic services in urban areas play a role in increasing poverty in cities, and therefore around the world inn a variety of ways. For example, Rakobi 2002 and Wratten 2005 show how urbanization is associated to awful living conditions, which only compounds the problem of poverty in cities even further. In 2008, the UN Habitat report had estimated that 900 million people live in slums, but these estimations are often underestimated and misrepresent the true figures of people living in inadequate and overcrowded housing.

(Rengasamy et al., 2001; Tolossa, 2010 show that when it comes to acquiring food, urban residents in poor areas pay more for their food than urban residents in richer areas, because the poorer populations live in overcrowded housing units or informal settlements that lack storage facilities, so they cannot buy in bulk as a strategy to save on spending. They also rely on credit from local shopkeepers. By this alone, marginalized groups in cities are already heavily disadvantaged, and subject to increasing to poverty rates even more so. Since informal settlements are often without access to piped water, residents in poor areas have to pay more for water as well. The ways in which urban poverty affect a large chunk of the world's population is detailed extensively through Tacoli 2012, and much of the points made in that article parallel the points I make about urbanization here.

With those statistics just mentioned previously, we can see how urbanization also produces greater poverty, especially in the most densely populated urban areas. This effect is more evident when the rate of urbanization exceeds the rate of economic growth, which is commonplace in developing countries. If a major portion of the population lives below the poverty line, the quality of life in cities is degraded. To the extent that government does not help impoverished city dwellers, those risk getting more marginalized and isolated. The poorest often end up living in slums or informal settlements which are unregulated, dangerous, and an acute risk to one's health and well-being. Those impoverished neighborhoods are cut off from the rest of the urban economy so that their inhabitants are either unemployed and/or forced to find unofficial forms of employment in informal sectors, which pay very little and impose dire working conditions. People stuck in the informal economy continue to be trapped into poverty, and it is an everyday struggle to just satisfy basic needs like food. Under such circumstances, cities will struggle to reverse the trends of rising inequality and bad housing conditions.

Increasing poverty is only one side of the coin. At the same time, urban living costs have increased exponentially as cities become more populated. While unemployment rates are a key factor in cities, increased housing costs over the years have forced the poor to spend an excessive portion of their income on housing. The cheapest available housing is often in disadvantaged areas with little access to transportation, health services, and other key public services that are quintessential for city living. Marginalized groups thus have to spend more for these health services, and such a dynamic adds additional burden to the poor. Only radical policy change may balance out these negative effects of rapid urbanization and increasing poverty.

Migration is another issue that cities have to deal with. As more people follow the movement of capital and job opportunities towards cities, governments often react to the increasing influx of people with regressive policies, particularly when it comes to providing means of entry. Such restrictive barriers, especially when directed against immigrants, undermine the productive contributions these new entrants could make to economic growth in urban areas if allowed full integration, not least also in terms of start-ups and cultural diversity. Instead pushed to the margins,

many migrants residing precariously in cities are forced into jobs prone to health and safety violations which governments then fail to enforce.

Cities will need to find sustainable ways of integrating newcomers by building more housing capacity, provide basic services that have yet to be met, and end the rapid growth of settlements that are segregated from the socio-economic fabric of a city. While ensuring the integration of migrants, communities should also not be burdened by additional demands on key services, obliging cities to figure out innovative ways of facilitating community-based production and distribution of basic services. Access to education can also help cities integrate migrants and newcomers into communities that welcome diverse groups of people. Language training should be part of those integration efforts.

2.1.4.3. Poor Government Structures

Cities are major drivers of economic growth, especially when compared to mainly rural areas. They provide space and opportunity for huge wealth creation, with the world's metropolitan centers having turned into disproportionately productive centers of the global economy. Yet cities have had a very hard time to get their fair share back from their contribution to such massive wealth creation in urban spaces, especially when considering the amounts of financial investments needed to maintain those spaces as functional. Add to this that most cities face financially costly challenges, such as deteriorating infrastructure, environmental degradation, and massive influx of people coming to live there. Without adequate investment in infrastructure or key social programs, too large a slice of the city populations will be subjected to social exclusion, violence, and lack of fiscal freedom. Changing these trends will require a lot more financial capacity to ensure that the negative effects of urbanization are properly dealt with. But in most countries municipal governments certainly do not have the fiscal capacity to keep up with the changes and respond to the challenges adequately enough. In most developed and developing countries, municipal governments get an extremely small fraction of government revenue when compared to federal and provincial governments, averaging just 11 percent of total government revenues (Zhang, 2015). Such low rates of government revenue leave municipalities unable to respond to poverty in marginalized populations and overcome the other challenges mentioned above.

And then there is also the issue of poor governance in the cities themselves. There are several departments tasked with managing basic services, like sanitation for example. They have to deal with ever-increasing population growth necessitating additional investments in infrastructure and public services without necessarily having enough means under their command to carry out those tasks. City government also functions in a hierarchical way. Its top-down approach often does not take adequate account of the specifics of each challenge, nor does it consider properly how the problem at hand affects specific tiers of the population. Local officials are thus overburdened which renders many of the challenges discussed above much worse. And while there are multiple agencies and departments to manage the city as a whole, they are not necessarily coordinated enough to take on those tasks collectively. The lack of coordination means that local authorities may not be able to provide for the general interest of community groups.

2.1.4.4. Food Deserts

With rapid urbanization and increasing urban sprawl, there is also cancerous spread of food deserts. We define these as urban areas that have very little produce available to feed households due to a lack of grocery stores, markets, or even gardens in which fruits and vegetables grow. In city centers, affordable grocery stores and farmers markets might have been driven out of key locations due to the increasing cost of rent in cities (and insurance in poorer neighborhoods). Food deserts can also exist in suburban areas. Either way, their prevalence is illustration of uneven and badly planned urban development. For individuals living in food deserts, whether in densely populated areas or suburbs, the challenge is to find adequate food supplies located often quite far away. At times this can make an individual's shopping trip cumbersome, with the low level of public transportation available especially in the suburbs (Mead, 2008).

According to the US Department of Agriculture Economic Research Service's Food Access Research Atlas (https://www.ers.usda.gov) about 10 percent of America's 65,000 census tracts qualify as food deserts whose 13.5 million people living in those census tracts having low access to sources of healthy food. With poorer neighborhoods having less than a third of the supermarkets available in wealthier areas, the problem affects black and brown communities disproportionately.

In food deserts, there are only very few convenience stores selling fruit and vegetables which are often more expensive too (Wilmers, Wilmers and Dave, 2012). For example, studies show that urban residents residing close to small neighborhood stores pay up to 37% more than populations in wealthier suburbs for the same selection of produce. At the same time food deserts are oversupplied with fast-food outlets, with the real cost of fast food having dropped by 26% between 1989 and 2005. Their predominance in poor neighborhoods induces unhealthy diets based on high levels of fat, sugar, salt, and processed foods such as cheap meat, soda, and chips. Poorer urban populations are at much greater risk of catching diabetes and cardiovascular diseases. Such dynamic poses as a serious health threat to a significant portion of the cities' population also often lacking access to good healthcare. The constant struggle of so many people to feed themselves well and affordably makes food deserts an urgent matter for cities to address.

2.1.4.5. Pollution and Environmental Crises

One effect of rapid urbanization is environmental degradation, specifically when it comes to pollution, erosion of quality of key common goods such as air, water, and noise, exploitation of biodiversity, and lack of greenspaces to counteract the negative forces of areas all built up in concrete. Greater urban sprawl causes more motor vehicles on the road, and that will increase greenhouse gas emissions and air pollution as a whole. Greater urban sprawl also means that there is more industrial development, with use of fossil fuels to expand these environmentally damaging industries. Increases in populations also cause more solid waste to be unleashed into the urban biosphere which also degrades the environment significantly. With government unable to deal with increased solid waste, populations often suffer from an inability to dispose of their waste in a proper fashion. This also leads to greater pollution on the streets (Sujathamma, 2019).

Rapid urbanization also has a devastating effect on the environmental quality of rural areas. Since more people are being concentrated into concrete urban areas, more agricultural sites are needed to satisfy that additional demand for food. McKinney (2002) shows to what extent urbanization has negatively impact vegetation, leading to a loss of biomass and biodiversity, as cities expand in new natural areas. Since more land is being developed, vegetation and biomass is shrinking in

many areas. Such a loss in biodiversity has a variety of adverse effects in terms of undermining natural carbon sinks, increasing greenhouse gas emissions into the atmosphere, changing precipitation patterns, and worsening pollution.

Inequality also persists when it comes to the environment. There are cases where specific environments or bioregions are significantly more neglected and degraded due to certain populations living there having been segregated or discriminated against institutionally. Sometimes, governments provide less mitigation measures in those areas due to discrimination based on class or race, or they permit certain companies to pollute or dump toxic chemicals into the soil in areas where people are poor and marginalized.

Such practices can be qualified as environmental racism, defined as a process by which people of color or marginalized groups suffer from a disproportionate impact of environmental hazards because of discriminatory rules, regulations, and policies of the government either deliberately imposing these hazards or just neglecting those spaces in communities that are targeted and discriminated against. Such a process marginalizes urban populations even further, worsens the issue of pollution in cities as a whole, and decimates the quality of life. Environmental racism is a major problem that cities will have to face, not least in conjunction with climate change as a whole.

Cities are a major source of pollution. With populations aggregated together, pollution becomes concentrated. Pollution travels from very densely populated areas and destroys other natural bioregions through acid rain or toxins carried by pollution. In addition, the amount of pollution produced in cities also deteriorates the quality of air for its surrounding inhabitants. With greenhouse gas emissions being the main polluter, the destruction brought by climate change is allowed to accelerate. Cities will urgently have to find regulatory and organizational solutions to reduce pollution.

In recent decades climate change has become increasingly recognized by urban populations as an existential threat, and many city governments are trying to implement policies and find tools that reduce the various effects of climate change, especially when it comes to urban sources of greenhouse gas emissions. Cities have been recognized as setting goals that would help the world

reduce the negative effects of climate change. From building energy efficient buildings, green roofs and spaces, and developing infrastructure of urban farming and recycling, cities have begun to take critical steps in pursuing adequate climate change mitigation and adaptation.

2.1.5. Policy Guiding Cities towards an Ecological Transition

The challenges of the cities require policy solutions which in turn depend on having in place adequate governance structures to tackle these issues as locally as possible. Better governmental organization can go a long way in dealing with environmental problems that have not seemed solvable with how urban governments have been structured until now. To begin with, nation-states have to figure out the respective roles and responsibilities of national governments, regional governments, local governments, and citizens or other stakeholders. But this question of subsidiarity is not one of innate hierarchy; it is instead a question of the scale of the problem, the intent of administrative responses, and the capabilities of different government units so that all levels of government can work together on environmental issues. The table below found in a study that was part of the Sustainable Development in the 21st Century Project (SD21) shows these governmental roles in environmental policy.

Table 2.1: Subsidiarity (Levels of Governance) and Environmental Issues (Taipale et al., 2012)

Type	Land Use	Buildings & Regulation	Public Buildings	Energy Infrastructure	Energy Production	Mobility Infrastructure	Public Infrastructure	Financing
National Government	National Land Use Priorities	National Land Use & Buildings Act, Guidelines & Specifications	Parliament Buildings, Ministries, Universities & Hospitals	National and Supranational Grids	National Policies & Taxation	National & Supranational Networks, Possibly Airports & Rail	Possibly Nationally Owned Railways & Airlines	Income & Business Tax, VAT, Sovereign Bonds & Loans from Markets
Regional Government	Regional Plan, Land Use Principles (e.g densities)	Regional Plans	Educational Facilities, Regional Utilities, Universities and Hospitals	Fixed Areas for Wind Farms	Large Scale Energy Production, Areas for Biomass Production	Trams, Subways, Rail Lines, Pedestrian & Cycling Routes, Roads	Regional Public Transport, Pricing	Subsidies from National Governments, Share of Local Income Tax, Fees for Service
Local Government (Cities)	Zoning & Detail Plans, Real Estate Policies for City-owned Land	Local Building Ordinance, Building Control	City Halls, Schools, Fire Stations, Daycare Centers	Local Neighborhood Scale Infrastructure for Renewable Energy	Local, Publicly Owned Energy Production	Trams, Subways, Rail Lines, Pedestrian & Cycling Routes, Roads	Municipal Public Support, Pricing	Local Income & Real Estate Tax, Fees, Possibly Municipal Bonds & Loans
Citizens & Stakeholders (Communities)	Participatory Urban Plannning	Petitions for Building Preservation and Right to Comment Permits	User Feedback, Right to Comment on Project Proposals	Local Initiatives, Programs for Renewable Energy	Local, Cooperative Renewable Energy Production	Private Roads	User Feedback	Taxpayers, Participatory Budgeting

This table, which is found in Taipale et al. (2012), gives us a good account to what governance structures can look like to favor sustainable development and climate change mitigation. With each level having a distinct role on what policies to put in place, it makes it easier for cities to provide space for stakeholders and citizens to assume participation in the city planning for the 21st century. But it is imperative that cities provide the right policy framework for adequate governance and citizen participation to achieve the new goals on sustainability. This is where cities can be at the forefront of innovation with new policies like low carbon areas, smart urban planning, and citizen engagement. The key for cities is that their policy responses have to be adapted to local circumstances.

During the last few years there has been a proliferation of climate mitigation and adaptation plans within the newly established global governance structure of the Paris Climate Accord of 2015. That agreement's objective to keep the temperature rise ideally to just 1.5 degrees Celsius implies a very limited carbon budget which prompts country after country to declare emission reduction

targets towards a carbon neutral economy, followed by specific plans of infrastructure investments and community-based initiatives to put their economies on such a transitional path. Both targets and plans will need to be made progressively more ambitious starting in November 2021 with COP26 in Glasgow. Already, the EU has passed a "European Green Deal" whose main goal is to make all of the European Union climate neutral by 2050 so that European's economy stops adding greenhouse gases to the existing stock already in the atmosphere. We can absorb a fraction of greenhouse gas emissions through carbon syncs as well as carbon capture and storage technologies. To get the greenhouse gas emissions to a carbon neutral (or net-zero) level means that emissions will have to have been reduced all the way down to a level where they can be fully absorbed by either existing carbon sinks (forests, ocean, etc.) or carbon capture and storage technologies yet to be developed. Regulations are necessary to get to that goal. To do so, members of the EU are negotiating the European Climate Law, which makes reduction of carbon emissions formal law. Once that law is implemented, new regulations and changes to existing EU law will be put in place to formulate strategies for agriculture.

In the United States, the Progressive wing of the Democrats has proposed a "Green New Deal," sponsored in the House by Alexandria Ocasio Cortez (D-NY) as House Resolution 109 and in the Senate by Ed Markey (D-MA) as Senate Resolution 59. This is a more ambitious plan than the European Green Deal. It wants the U.S. economy to reach carbon neutrality by 2030, including 100% of power supplied by clean, renewable energy resources by 2030. Other initiatives include supporting community ownership, local family-based farming, preserving land and restoring natural bioregions through afforestation and ecosystem preservation. Even though commendable in its ambition, the Green New Deal faces very low odds to pass as long as Republicans keep insisting that climate change is not a problem worth addressing by policy.

Still, Biden's American Jobs Plan of 2021 aims to invest around 2 trillion dollars within the next decade for infrastructure, including climate-related infrastructure improvements such as retrofitting buildings, creating a low carbon energy mix, constructing a smart electricity grid, and phasing out fuel combustion engines in favor of electric vehicles. The plan also plans to provide 40% of total funds to disadvantages communities that are in need of climate-based infrastructure

(Biden 2021). Both versions of the green new deal have a heavy focus on communities and their collective action in terms of resiliency, which emphasizes environmental and social justice.

Of course, implementing these various plans will, among other objectives, also direct large sums towards making large urban centers resilient to climate change while also radically reducing greenhouse gas emissions in those agglomerations. That will above all involve expansion of public transport, substantial improvements in energy efficiency, retrofitting buildings, and also a variety of community-based projects for greening of spaces and reduction of environmental racism. These initiatives have to go beyond centralized national objectives towards local and provincial levels of policy-making and administration. For example, in 2019 New York State passed the Climate Leadership and Community Protection Act (Climate Act) setting goals for climate change mitigation. Those goals getting translated into specific policies and initiatives, as crystalized in the Climate and Communities Investment Act, which, among other features includes investment into the community. Revenues raised by carbon taxes on big polluters, paying 55 dollars per ton of greenhouse gas emissions for an estimated 15 billion dollars per year over the next decade, will fund community-driven programs such a community solar, making important structures such as homes and schools more energy efficient, and investing in adaptation infrastructure. Large polluters would have to reduce dumping their toxic waste in marginalized communities, specifically in black and brown neighborhoods, as a first measure to tackle the issue of environmental racism. Marginalized groups would be given the opportunity of moving into the highly skilled workforce in areas that deal with renewable energy.

In addition, cities have also introduced their own climate action plans as Tokyo illustrated with its ten-year plan from 2007 to reduce 30% of greenhouse gas emissions. Since then, most of the major cities of the world have followed Tokyo's example of implementing their own mitigation measures, with the most important cities grouped together in the C40 cities platform (www.c40.org), an open-source platform to exchange information about various initiatives, propagate innovative community-based solutions, and spur discussion about specific issues. Such action plans provide a space for urban commons to flourish in new governance structures and get implanted in sustainability-oriented economies.

Section 2.2. How Urban Commons Contribute to Such Policies

Climate-related policies like the European Green Deal and C40 will continue to grow in importance. But questions remain how best to put these policies into action. In this context it is worth keeping in mind that urban commons are effective low-budget solutions to achieve ecological progress and implementation, warranting continued effort in this direction. This section will take all the elements of urban commons together and show how these various community-based local governance structures correspond to the institutional structures of cities today while also taking into consideration the ambitions of their climate-responsive policies. Specifically, we will highlight forms of collective engagement that urban commons bring to neighborhoods, ways in which urban commons counter regulatory slippage by municipalities, and new roles and responsibilities urban commons can assign to governments and communities which have the potential of transforming the climate-driven policy agendas of cities. All these facets of urban commons should prove effective in achieving polycentric governance schemes for communities and horizontal subsidiarity for citizens and municipalities alike.

2.2.1. Urban Commons and the Importance of Collective Management

When looking at urban commons, collective engagement is at the core of their implementation. Collective management of urban commons requires private actors to work and manage a space together, but with the presence and backing of city governments. Since governments are the main service providers, their role will always be important for the development and preservation of urban commons (Foster 2010). However, government should be able to leave some management responsibilities to the communities, because those know how to manage and customize their space better than anyone else. As such, city governments are not burdened with additional costs of maintenance, making it easier to focus on other aspects of government that need more funding (Foster 2010). City governments can also build an infrastructure or a set of rules and regulations designed to increase collective management efforts within communities.

Communities may well be more efficient in running urban commons than any management scheme organized by a city government having a myriad of responsibilities for a large and complex high-

density area. Communities can also better address specific problems within a neighborhood. Some problems only exist in that neighborhood, so the people exposed to this problem know best how to respond to it. It is likely that residents can resolve conflicts more effectively on the micro level, among members who know each other well (Ellickson 1991). It also allows the communities to customize the space so that it best fits the neighborhood's character, which in turn adds even greater cultural value to certain areas. It has been well documented that there is an empirical link between the collective oversight of an urban space and the economic value of the surrounding property (Clapp 2000; Foster 2010; Harvey 2012). In areas where urban commons have been established, homeowners within these communities have received direct payoffs by participating in the developments of such valuable spaces. As a result, community members have a genuine interest in being further involved in urban commons if they want to feel the benefits of increased property value.

Several scholars have also illustrated the advantages of introducing such a system of collective action. Dagan and Heller (2001) have stated that the ideal modes of organization within collective action efforts in urban commons allow these homeowners to receive such benefits when collaborating in the management of a resource. But in such a system of collective action, homeowners retain the right to exit if they feel that the benefits are not worth the effort in participating. If an urban commons has little prospect of improving the sets of standards imposed by the community, each community member can reject and abandon the collaborative project of improving an urban space (Dagan & Heller 2001). Community members thus have a certain level of freedom which allows the efforts of collective action to be less burdensome for community members seeking to receive benefits within their neighborhood (Foster 2010). That ensures a certain level of quality that makes the collective action of urban commons successful. Ostrom (1990) has also claimed that collective action for a common property resource is the most effective way to increase the value of a resource while at the same time avoiding the overexploitation and degradation of that resource. That collective action must be organized under "shared norms of appropriation, delineation of permitted appropriators, rules and local conditions, effective monitoring by accountable individuals, and clearly defined boundaries" (p. 8). In other words, Ostrom specifies certain criteria to make the organization of urban commons more usable, more efficient, and better structured in ways that lead more likely to their success.

The same argument applies even more convincingly to less privileged neighborhoods, where interaction between community members is impeded by the general condition of a poorer community. To the extent that the city governments are unable or unwilling to provide adequately for the residents in these neighborhoods, collective management increases social capital disproportionately by engaging poorer populations to interact and collaborate (Foster 2010). If and when such collective action efforts tangibly improve the condition of historically marginalized neighborhoods, the urban commons created there become more attractive and valuable for their residents. Overall, the quality of life within a city increases as urban commons become major hubs of culture, environmental protection, aesthetics, and community gatherings.

2.2.2. *The Problem of Regulatory Slippage and How to Counter It*

There is a major problem with public access spaces owned and managed by the government. Because urban spaces and structures, by nature a public good, lack both rivalry in consumption and excludability in access and benefits, they run the risk of being overexploited and degraded, especially if there is no governing force to control how the space or structure is used (Foster 2010). There are several cases where such urban spaces or structures get degraded rapidly, because governments are unable to maintain and manage a resource properly due to financial or administrative constraints. When a governing body fails to do its job of surveillance and management properly, people are free to use and even abuse the resource to a point where it runs the risk of being degraded. These circumstances are known as incidents of regulatory slippage. Regulatory slippage stemming from the government's inability to manage an urban space often creates rivalrous conditions between users, which triggers further degradation of the resource (Foster 2010). The existence of regulatory slippage gives credibility to the argument that open urban spaces with natural specimens should be privatized so as to be managed by a group of shareholders who have the rights to exclude the public from access.

A classic example of regulatory slippage is when a public space, like a park or a neighborhood, becomes popular and eventually overcrowded, resulting in congestion that damages the resource over time. Roy Rosenzweig and Elizabeth Blackmar (1992) recount the deteriorating conditions

of New York City's after the city had lost control of park enforcement and maintenance from the mid-1970s onward when a huge fiscal crisis forced budget cutbacks. Maintenance and clean-up costs pertaining to that park were comparably high because of the large numbers of residents using the park for competing purposes. When New York City Department of Parks & Recreation had to cut back, the park underwent deterioration and increases in crime, rendering the space increasingly unusable for the public. As a matter of fact, the entire city park system was subject to such erosion, and users essentially abandoned all the parks in the city (Rosenzweig & Blackmar 1992), a classic case study of regulatory slippage.

Regulatory slippage can negatively affect the general condition of a city as a whole when there is too much congestion and not enough maintenance of public space. This causes rivalry between users and excess demand for the usability of the space, which in turn increases the cost for all users of the space and discourages primary users to continue investing in the space's well-being (Foster 2010). The same can be said about neighborhood commons, where people share the sidewalks, streets, and the local businesses within them. If the government is unable to bear the costs of maintaining the streets, the neighborhood will be subject to excessive loitering, aggressive panhandling, graffiti, or littering (Foster 2010). Such deterioration may spur moves to privatize urban spaces in order to match the costs needed to maintain these spaces. As a result, much of the public is forbidden from accessing the spaces, creating inequality and socio-economic tension between groups of people. When only a small group of rich neighborhood residents end up paying for the standard quality of life that everyone aspires to reach, most people get shut out. Cities become uninhabitable under these circumstances ((Foster 2010).

Local governments often lack budgetary resources and support from state or federal government to support public spaces (Clapp 2000). A second option is to increase privatization of urban spaces, allowing the most frequent users to organize more easily among themselves and exclude the public from access (Demsetz 1967). Increased privatization may make decision-making processes more efficient and augment the quality of life within the space, but excluding the public may provoke socio-economic conflicts between wealthy and poor communities, which is problematic for any development of urban spaces (Garnett 2014). The best option is to allow public access while at the same time prioritizing the condition and preservation of urban spaces. In that case the government

might transfer responsibility for a dedicated space to community members who decide an informal set of rules and manage the park themselves (Hess 2008). Responsibility of space maintenance thus moves into the hands of actual users who may know the space. This leads to efficiency in the management of the space, while also allowing governments to avoid the cost of maintenance and allocate their resources to somewhere else.

The local government is the owner of many vacant or public spaces. As the owner, it has the authority to impose certain rules that prioritize collective action and even provide some benefit to those who are motivated to participate (Harvey 2012). Such benefits include funding mechanisms and providing resources that help participants maintain and monitor the public space while also encouraging collective collaboration and community participation (Hess 2008). The government thus can foster setting up urban commons as counter-weight to regulatory slippage.

Through this perspective, an argument could be made about how urban commons can do better at managing vacant, underutilized, or shared urban resources and spaces than even a properly functioning public sector. As shown before, the public sector is constrained by limited budgets, limited taxing or enforcement powers, compartmentalized views by specific public departments by who resource management should be run, bureaucratic clout, and beholding to their own profit-driven interests like selling vacant spaces to private developers. This is troublesome for cities who aim to use as much space as possible for the benefit of the community. In addition, the vacant and shared nature of much of these resources are subject to multiple sets of users who may put that resource at risk of degradation and depletion if no commoning is applied to the use and management of that resource.

The vast scope and nature of the urban landscape to which these resources reside means local governments may have priorities over maintaining certain resources and spaces over others. Governments only have limited reach on these resources as whole, because of the complex nature and scope of vast urban landscapes. Since commons are organized by communities, commons are set up to reach as many of these resources as possible, as long as the community follows a commons-based approach to managing those resources sustainably. Commons thereby have greater outreach potential in managing more resources through community organization and

commoning than governments do with their limited scope of government power and outreach. And when some of those resources are subject to the market sphere, many community members may lose out on a potential resource they could have enjoyed if a commons-based management system was put in place instead. An example of how effective commons are at managing more resources like abandoned vacant lots in poorer districts of a city is in Ela (2016), which shows a mapping of a series of lots in the Southside neighborhoods of Chicago (such as Englewood) that have into community-led urban farms and gardens providing food and ecological benefits to marginalized populations in ways the City of Chicago have failed to do. This makes for a compelling argument in using the commons framework and the actions of commoning to best manage these resources.

Furthermore, commons may manage urban resource more sustainably and efficiently than the public sector. Commons implicate all levels of actors in the community, which, when their solutions are bundled together produce a horizontal flow of management. This is also tied to the notion of horizontal subsidiarity where all income-levels of the population gain access to ecological benefits that come from urban commons in general. Processes of commoning are designed to keep the lowest tiers of the population within a decision-making role and in the management of resources. This empowers those communities and encourages the growth and expansion of ecological resources in cities. Commons are examples of how horizontal subsidiarity is applied in the context of cities and access to resources, and they show how all levels of the community give access and management tools to resources they would otherwise not have access to if those resources were managed in the public or private sphere. Coproduction and collective arrangements stemming from commoning come from collectively social rules and practices and tasks, making such a production or management scheme cheap or at no costs.

The inter-grouping of communities to manage the space as a commons also means that those resources will be managed by group initiatives on low budgets and through shared collective roles, not through large budgets are bidding contracts that make governments subject to poor management and regulatory slippage. An example of this is the La Borda Cooperative in Barcelona, which relies on self-management among housing members, voluntary contributions by individuals and groups, and the self-construction of its building by its members (Foster and Iaione 2016). The tenancy of land, which belongs to the city of Barcelona, allows a 'grant of use' policy

for housing units, so the members are free to organize how they will use, configure, and construct these spaces (Cabré & Andrés 2017). The cost of the lease is shared by all members to reduce individual costs and the arrangement is set up to last 75 years (Foster and Iaione 2016). This avoids all costs associated to planning, zoning, and building on those spaces and resources. And it allows roles of management of resources to be prioritized where functioning public sectors do best their job and where commons fill a void where they managed urban resources subject to regulatory slippage and environmental degradation.

2.2.3. New Roles for Governments and Communities

We have seen instances in the past where community organizations assumed responsibility of patrolling the activities in an urban space, by forming informal patrolling groups that have some authority over the uses of, say, a park. The emergence of the Guardian Angels in partnership with local New York City police, for example, was seen as successful, not least because members of that group shared information with police officers to patrol these spaces more effectively (Pennell & Curtis 1989). There have been some cases where the police department has provided resources to these informal patrolling groups in order to make the patrolling of a space more effective. The result of these new forms of patrolling is respect on the part of the public for preservation of these public spaces and safety, which has augmented the quality of life for many residents in certain areas (Pennell & Curtis 1989). Such cooperation arrangements may allow governments to save on costs for maintaining these urban spaces.

Furthermore, governments can sign long-term leases for vacant lots with neighborhood residents interested in providing a communal and usable space to the surrounding community. This allows community members to take on the responsibility of maintaining urban space and customize it for uses that best represent the community as a whole. Governments can in this way be alleviated of the costs of maintenance and upkeep, as it is now the residents' job to maintain that urban commons (Foster 2010). This could be an efficient way for governments to reduce costs. One can see numerous examples of governments providing long-term leases to community residents for a vacant lot. The Elizabeth Street Garden in New York City represents a classic case. This garden was once an abandoned vacant lot. But a neighborhood resident living next to the lot decided to

sign a lease with the New York City government, and he turned the open space into a community garden with several art sculptures and green areas. This has become a hallmark used repeatedly by surrounding communities in a neighborhood where green space was extremely scarce. The Elizabeth Street Garden was a very successful example where a government provided certain contracts that would foster the development of a green urban commons.

City governments can save a lot of time, energy, and money, if they transfer upkeep responsibilities to communities empowered to act as commoners (Clapp 2000). Even though city governments are constitutionally ranked as less powerful than states or the federal government, the United States legislation permits city governments to manage land use within the city's boundaries so long as it does not interfere with state or federal law (Garnett 2014). With that said, it is imperative that city governments pass on the norms and rules of management to communities in order to improve upon different urban commons. City governments are only able to provide public and common goods up to a certain point, which means that there is a great probability that 'residual unsatisfied demand' exists among individuals who expect a greater quality and or quantity of goods than their local government is able to provide (Foster 2010). There is thus possibly a lot of space for that residual demand to be met by arrangements involving urban commons managed by neighborhood communities.

Even though are we arguing in favor of passing on some management responsibilities to communities, city government should never abandon its role of providing basic public goods and services. While communities can handle some collective management functions for urban commons, it is still the city government's responsibility to provide the primary necessary services of sanitation and policing. Community improvement districts (CIDs) provide a perfect example why city governments must always be present in urban commons. Workers and guards in these CIDs may be responsible for picking up trash and debris or patrolling the streets and parks, but it is ultimately the city government that provides a removal and sanitation service (Garnett 2014). While CIDs may collect garbage and hold it somewhere away from the commons, it is the Department of Sanitation which disposes of it either through recycling processes or landfills (Foster 2010). Hence the city government is always present. This example illustrates how urban residents and municipalities should interact with each other in order to take care of an urban

neighborhood. When it comes to urban commons, both governments and citizen groups, such as CIDs, should cooperate as partners and assume their own responsibilities in their roles to thrive in a new policy agenda and improve the neighborhoods of a city.

Section 2.3. Identifying Existing Forms of Urban Commons

To best show all the complexities of what urban commons are and how they may help cities best manage urban resources as presented in the various arguments found in the previous section, it is important to show the different types of urban commons that exist and the various forms that they take. Identifying types of urban commons helps develop the exercise of pinpointing which urban commons are best at developing or managing urban resources of different specific sectors. This next section focuses on identifying specific forms of urban commons that respond to context-specific situations, and may be formed or managed differently depending on what form they take. Those forms are specified by each subsection in this section, and they will reflect on the kinds of urban commons we can identify today.

2.3.1. Public Access Community Gardens (PACGs)

The collective management and participation occurring in public access community gardens offers many advantages, and consequently such PACGs have become a leading type of urban commons (Colding & Barthel 2013). PACGs arise from publicly or privately owned vacant lots. They allow neighborhood locals to grow food and plants, conduct urban greenery, and work together to achieve self-sufficiency. Often enough these community gardens are temporary set- ups before the vacant lots are put under construction. The permanency of these community gardens depends on well-organized collective action and strong local governance to develop a strong appearance or aesthetic that adds to the character of the neighborhood (Schmelzkopf 1996). This aesthetic is usually attained when people grow trees and perennials, maintain lawns, and install specific features like benches, gazebos, and brick paths that allow people to spend time there and explore. Colding (2011) has demonstrated that community residents possess a greater willingness to invest in PACGs if leases of vacant lots are long-term and protected by NGOs and other organizations.

This is something for urban planners and government officials to consider if they want to produce PACGs.

The general objective of creating PACGs is to stimulate collaborative urban planning and involve a wide range of stakeholders (rather than just the traditional powerful elite) to ameliorate the quality of life in different neighborhoods. The quality of life usually contains provisions of opportunities for learning while also involving a diverse range of participants with different ethnic backgrounds working together to achieve a common goal (Krasny & Tidball 2009). Wenger (1998) illustrates how PACGs provide plenty of learning streams for participants. For instance, many people familiarize themselves about local ecological conditions of their surroundings by learning how to garden different crops and plants (Bendt et al. 2014). They learn under what conditions a certain crop can grow, the symbiotic relationships between different crops, and the kind of nutrients that are gained or needed when there is greater biological diversity within the PACG (Colding et al. 2006). People also develop collective memories of growing food in urban settings that can be captured, stored, revived, and transmitted to others over time (Colding & Barthel 2013). This collective memory helps people share information on changing physical environments, adding resilience by improving response capacity to physical and socio-economic fluctuations. People also manage regulatory and supporting ecosystem services like pollination, water cycling, soil formation, and nutrient retention (Barthel et al. 2010). Increased biodiversity amplifies the general environmental aesthetic of neighborhoods, making people more willing to manage their surrounding area properly if they perceive it as 'beautiful' (Blanc 2012). In addition, the beautification of urban areas will over time attract a more skilled and motivated labor force (Yigitcanlar et al. 2008). Attracting more skilled workers to local areas improves the value added of economic activity in such areas, allowing cities to prosper and provide opportunities for a greater range of people.

PACGs are also a great laboratory for learning about social organization and integration. Since their management involves a range of participants, working together is crucial. People are obliged to compromise with one another, a crucial aspect in the establishment of a commons. The learning capacity arises out of negotiations that people engage in to determine how spaces in a city get used and developed (Bendt et al. 2014). Not only do people become better informed about their local

environment, they also develop the capacity to organize collectively even if they have divergent interests (Colding & Barthel 2013). The ability to organize with others gives participants the capacity to become social entrepreneurs, who come up with innovative solutions to address the social problems arising from the shareholder-dominated capitalist system.

The development of PACGs offers educational opportunities, as younger people learn about environmentally responsible behavior, positive youth development, collaborative consumption, and the linkages of global and local food security. The end result is an increase in more skilled members becoming active part of the civic ecological community. Through PACGs, people generally become more scientifically literate, better at practicing resource stewardship, and eager to engage in civic duty. These factors are essential in build upon the sustainability and resiliency of a neighborhood.

PACGs also nourish cultural diversity which makes people more open-minded and attentive to social problems arising from cultural differences, and they learn to work with a greater range of people (Milliken & Martins 1996). PACGs typically engage a diverse group of stakeholders, including resource users of different ethnic groups, scientists, community members with local knowledge, NGOs, and government officials whose inherent differences in outlook and knowledge make them collectively better informed as they share what they know (Colding et al. 2003). Ostrom (1990) claims that when there is a greater amount of participants sharing a common value within a tight set of institutional arrangements, the probability of developing the best norms, rules, and values is much greater, while the cost of monitoring and sanctioning those who break these rules decreases.

Often enough PACGs become hubs for cultural activity, where people participate in concerts, art performances, film screenings, and workshops that involve group members themselves. This enhances the cultural richness of a neighborhood (Barthel & Colding 2013). When PACGs foster cultural activity, people come to understand different ranges of culture all together, which in turn makes it easier for them to work with one another (Foster 2010). If there is conflict within a community, the PACGs act as places where individuals can resolve their own personal issues. The cultural diversity also gives people incentive to partake in land management schemes related to

such PACGs (Colding et al. 2003). As PACGs spread over time, people become more willing to participate as they seek to strengthen their social relations, recreation, and food acquisition while also developing a sense of being welcomed, relaxed, and active in responding to environmental concerns (Andersson et al. 2007). Like urban beautification, greater cultural diversity attracts highly skilled workers who become major economic actors. The increase in more skilled workers adds a greater dimension of cultural diversity while continuing to allow local urban economies to grow consistently (Yigitcanlar et al. 2008).

When analyzing the dynamic of a PACG, we must study in detail their institutional framework legally defining underlying property-rights arrangements (Colding & Barthel 2013). In well-established PACGs, the institutional frameworks are established within the community. Quite typically, it is the local government that would own the land, but would not get involved with the rights people possess with regards to the PACGs. Communities collectively decide the rules of management and usage, and the roles each participant has in maintaining a PACG. These rules are decided de facto, meaning there is little or no government intervention. People can thus mobilize on their own without having to bear the costs of ownership to a land. But because some lands are publicly owned, many people have access to them and can thus participate at free will. This may burden the land's productivity, especially if the participants lose control in maintaining the land. In such circumstances, governments may get involved. But in the end, PACGs fulfill the role of integrating large numbers of people together, involving entire neighborhoods to participate, follow the rules, and maintain the land sustainably (Colding & Barthel 2013).

2.3.2. Allotment Gardens

Allotment gardens are a type of urban commons which only includes a small amount of people. There the spaces are not open access, but instead maintained by a well-established group of people capable of excluding others from the usage rights to the land (Colding & Barthel 2013). Allotment gardens are often owned by a municipality and usually contain large amounts of garden plots that are equal in size. The crops growing in these garden plots typically include vegetables, fruits, and ornamental flowers (Colding et al. 2006). Participants develop their own rules, and people are assigned specific roles. The possibility for active participants to exclude others means that it is

easier for them to maintain the land and grow food sustainably. Like PACGs, many of the participants enforce their own rules, but with allotment gardens the rules become more specific and, in some cases, more productive. This is because the smaller number of participants holding the 'operational-level' property rights are also able to manage their own plots independently, giving them full control of the crops they produce (Colding & Barthel 2013). Allotment gardens contribute more greatly to the collective memories of gardening in urban settings as their participants manage their own garden plots (Barthel et al. 2010).

By analyzing both PACGs and Allotment Gardens in detailed fashion, one will realize that this concept of urban commons is vital in promoting resiliency and sustainability at the local level. Resilience, as pointed out by Berkes and Colding (2012), refers to the ability to adapt to change without losing original controls of function and structure by means of self-organization as well as learning opportunities. It is a crucial quality of social organization when facing dramatic and systemically threatening change. PACGs and Allotment Gardens, prototypes of urban commons, promote cultural appreciation and integration, values of environmental stewardship, knowledge creation, and learning streams that all contribute to the overall resiliency of a community with respect to climate change (Bendt et al. 2014). Not only do city residents become more empowered in urban commons, but neighborhoods also become more ready to adapt more quickly to negative effects of climate change. Urban commons can play a major role in fostering urban agriculture in support of locally generated food, encouraging greater self-sufficiency in neighborhoods whose residents find it difficult to find and afford healthful food otherwise. Urban commons also can help reduce the costs of fossil-fuel based energy transports and promote conservation methods for threatened urban areas.

There are additional advantages in fostering urban commons in cities. They promote levels of cultural integration that make it easier for people to resolve local conflicts. They implicate a wide range of local residents to participate in movements that are fundamental to the development of cities, while simultaneously creating opportunities for those underemployed (Colding & Barthel 2013). People involved in urban commons gain management skills to respond quickly to fast-changing variables, such as natural disasters and economic crises (Colding & Barthel 2013). Such participants also produce socio-ecological collective memories that will shape their experience

with the environment in positive and necessary ways (Bendt et al. 2014). This builds upon the capacity for people to learn about adaptation and preservation in cities. Finally, local governments benefit as they do not have to bear the costs of managing these urban commons, especially since participants arrange their own rules and norms (Colding & Barthel 2013). Local governments will also benefit from urban commons as people become more involved with civic voluntary management, ultimately reducing economic vulnerability in urban settings.

Urban commons become increasingly relevant when looking at the ongoing trends of rapid urbanization in a shareholder-dominated capitalist system. The increased array of private property rights and loss of general public access to collectively shared resources means that urban sustainability is less guaranteed. This trend can have bad consequences for many city dwellers in terms of urban decay, environmental degradation, and socio-economic conflict. Cities contribute to 78% of carbon emissions, 60% of residential water use, and 79% of wood for industrial purposes (Grimm et al. 2008). On top of that, most of the cities in this world are in areas of rich biodiversity, where using up more natural resources is an inevitable trend (Ricketts & Imhoff 2003). These statistics alone make urban commons crucial in the ongoing challenge of assuring sustainable development in cities and surrounding areas.

2.3.3. Community Organizations

Community organizations are also considered urban commons, because they are formed by actions of commoning often enough to gain control over certain shared urban resources. The construct of a group is often done when collective ambitions and objectives are shared. Then group work helps those formed associations manage those commons in accordance to their community needs. These community organizations become then the hallmark of what urban commons can possibly be, and they take many forms. For example, neighborhood committees are often formed to better manage open spaces and streets in their neighborhood. They are also formed when certain systemic issues plague their community and very little solutions are sought out by local governments or private developers. Their formation as a community organization responds more effectively to those systemic issues through collective organization by a group of interested neighborhood members. By nature, these neighborhood committees contribute to urban care directly when managed as a

commons reaching as many tiers of the population as possible. Apart from neighborhood committees, other community organizations exist as urban commons as well.

Park Conservancies act as examples of leverage mechanisms that promote collective action in partnership with the local government. Park Conservancies act as non-profit organizations which collaborate with local government in the planning, design, and implementation of major park projects. Since governments assist in the acquisition of materials and financial resources for these projects, these organizations are now able to perform tasks that the government would have otherwise had to do in the organization's absence (Hess 2008). This is an example of a government leveraging certain administrative processes for organizations that are committed to maintaining and renovating public spaces.

2.3.4. Friends Groups

Friends Groups are another example where governments allocate certain benefits to groups of people focused on urban commons' maintenance and upkeep. In direct response to the negative effects of regulatory slippage, Friends Groups have often assumed the responsibility for investing, raising funds, and seeking support for a park's renovation and preservation (Foster 2010). When such a group is successful in performing these tasks, governments provide these groups training and financial support, drawing in more people who are interested in the development of urban commons. Governments have also created volunteer-oriented programs that help spaces develop and be maintained by communities. Greenthumb, a voluntary program in the New York City Parks Department, is a typical example of a city government providing aid in the maintenance of a space. Since the trendy emergence of PACGs in Lower Manhattan's East Village in the 1980s, Greenthumb has managed to bring together several volunteers interested in the preservation and renovation of urban green spaces within the city streets (Zukin 2009). The program has proven to be vital for communities in Manhattan and Brooklyn who share and use these spaces frequently. Some PACGs have allowed users to grow their own food and use the space for cultural gatherings, integrating many members of a community together and improving the social capital of each user. Greenthumb has helped many community gardens over the years become the irreplaceable urban green commons they are today (Zukin 2009). In general, the volunteer efforts stemming from these

efforts allow people to pool different resources that the government would no longer be able to provide. This enables the volunteers and local residents to help different neighborhoods maintain and preserve these spaces.

2.3.5. Business Improvement Districts

When it comes to neighborhoods, there are specific mechanisms that communities use to maintain the streets, sidewalks, building facades, and local businesses that hold a community within a neighborhood together. A prominent example of such a mechanism is the establishment of a Business Improvement District (BID). Foster (2012) defines BIDs as non-profit organizations established by local businesses and property owners in specific commercial urban areas that generate a lot of capital. These economic actors collaborate to provide street-level services, often focused on managing the rehabilitation and maintenance of streets, squares, parks, and 'commons' areas. BIDs were formed as a response to regulatory slippages imposed by the government, and the involved actors assume much of the responsibilities that governments are unable to commit to. BIDs allow individuals to undergo legislative processes usually under the control of a municipality to empower themselves and so reinforce their commitment to improving the local neighborhoods (Garnett 2014). An example of this is how they tax themselves in order to fund additional services of management. Such a legislative establishment on the individual level allows actors to avoid the typical problems of free-riding and coordination while at the same time improving their neighborhood without the presence of the government (Foster 2010). However, setting up BIDs is complicated and costly. It may even take years to prepare the necessary groundwork to establish a BID, especially when it comes to pooling money from different resources and coordinating each meticulous plan. As a result, many neighborhoods choose different mechanisms of managing their urban commons

2.3.6. Microgrids or Distributed Energy Systems

While Hess (2008) perceived microgrids as a type of energy commons, we can also interpret them as urban commons, especially since we know most energy distributed systems or (DES) are found in densely populated areas (Roberts 2010). As part of a broader climate policy agenda prioritizing

resilient "smart" electricity grids, cities will increasingly be interested in moving towards local generation of electricity and produce that energy via small-scale low-carbon local sources where energy can be consumed where it is produced. To harvest the most amount of power available in local areas requires DES to be in high-density urban areas. From that perspective microgrids are a necessary complement in decentralized electricity distribution systems and should be considered urban commons of growing importance in coming years.

DES refers to energy grids that get distributed by several local sources independently from each other in a decentralized network. These local sources can come from public or private prosumers (i.e. peers who co-produce energy into the grid and consume energy from their local source). Because we have a grid that is not centralized and does not have a defining hierarchy as to how energy is produced or consumed, a collective governance of how this grid expands is essential to production of DES systems. Often enough, local sources are from renewables that are installed in public, private or common property. These renewables are then managed locally in a vast network. Production of renewables in such a distributed manner allows us to classify renewable energy as a common pool resource, as its generation, integration, and storage is co-produced by a wide range of prosumers (Wolsink 2020). Microgrids can then become urban commons playing a crucial role in a broader ecological policy agenda, especially one that empowers urban communities to co-produce a wide-ranging infrastructure for DES in a completely horizontal and collective form of organizational governance. Regulation of energy systems must not interfere with this process if municipalities and other government agencies are serious about transitioning our energy sources to renewables.

2.3.7. Occupied Buildings

Occupied buildings are typical types of urban commons, responding to regulatory slippage. Many publicly owned vacant buildings in underserved or underdeveloped areas are often subject to degradation, neglect, and crime. Part of this is due to the governments' inability to assume the role of maintenance. Communities that live near these vacant buildings will often occupy them. If there is no governance in buildings' occupation and the occupation becomes anarchic, the buildings may be subject to criminal activity and massive tension. But if communities come together and organize

a collective governance framework for how such a vacant building can be used, that occupied building becomes an urban commons.

Several scholars and policy analysts like Iaione (2014) and Foster (2016) point to the reactivation and reuse of vacant buildings as a key measure in addressing urban crises. As neighborhoods come together by collecting information, sharing tools, and exchanging good practices, such a process of reactivation becomes vital in reviving urban areas. For example, some vacant buildings become forms of collective affordable housing for marginalized groups, meaning that the housing crises can be solved directly by an urban commons approach. This was done in Barcelona with a collective squatting group known as Can Masdeu who occupied an abandoned complex and transformed it into a cultural and housing center for nearby residents, using collective forms of governance to manage the building together and autonomously (Fournier 2013). Other forms of collective occupation efforts were also used to reclaim former public or private cultural institutions as collective artistic and cultural sites managed by the community (URBACT III, 2018). An example of this is the Beni Comuni movement in Italy, where such historical sites were abandoned by regulatory slippage and then later occupied by groups of artists and cultural enthusiasts to make these spaces accessible to neighboring communities.

For such occupations to be successful, and to consider vacant buildings as urban commons, two approaches need to be adopted into the policy agenda. The first is at the local level, where regulations and guidelines must support the occupation of these buildings so long as there is a verifiable governance network that implicates the communities. City councils must be a partner and ensure political support for the development of vacant buildings as urban commons (URBACT III, 2018). Governments must also make sure that the occupation is legally feasible by assigning agreements, contracts, and other legal procedures that protect this collective occupation process. Such tools must also address how the building will be used, maintained, rehabilitated, and administered in a self-management structure so that the responsibilities are devoted to the communities that occupied these spaces.

This section shows how urban commons can be PACGs, Allotments, Community Organizations, BIDs, Microgrids, or occupied buildings, all of which represent a various set of urban resources,

are used in managed in diverse ways. Distinguishing those and determining their unique characteristics as urban commons shows the type and the amount of resources that could be managed by commons, providing advantages to cities in a variety of sectors and locations. By analyzing the different forms urban commons can have, identifying them in an analytical point-of-view becomes easier and more effective. This section gives a good variety of the forms urban commons can take. This also helps the thesis present varieties of urban commons by category. In other words, this last section allows for the introduction of the next section 2.4, which highlights a categorization where we can identify context-specific characteristics for many types of urban commons.

Section 2.4 Constructing a Categorization of Urban Commons

This section aims at a categorization of urban commons using different definitions and typologies found in the existing literature. Such an exercise draws its justification from the incredible variety of commons we can find nowadays. Commons can range from elements of natural capital used by humans, such as waterways, to highly sophisticated citizen initiatives meant as alternative governance structures moving us beyond the frequently unsatisfactory dichotomy of the government's regulatory reach and private profit motive of enterprise. Their huge differences notwithstanding, either type of commons can be found in cities and play a useful role in climate-change mitigation or adaptation, arguably over the long haul the most pressing challenge faced by the majorities of cities in the world. In this section, we will distinguish between different types of commons in the urban setting along two different vectors, ultimately yielding a 3 x 3 urban-commons categorization matrix at the end. The first track identifies urban commons on the basis of their purpose, whether ecological, social, or immaterial. And the second criterion of classification deals with access to such urban commons – whether civic, community, or private.

A categorization of urban commons contributes to the advancement of this literature, and it helps identify the types of urban commons that this thesis analyses in Chapters 3 and 4. Such a categorization enriches the types of urban commons that can be studied in academia and strengthens the notions of urban commons theoretically as well. This categorization will specifically help us show how the analyzed urban commons of this thesis form and live, based on

the type of urban commons they are. This can help narrow down my research further into focusing on one specific type of urban commons with type-specific characteristic and features. This proves especially useful when researching with a vast subject like commons, which has plenty of varieties, forms and perspectives that make research on this topic complicated.

2.4.1 Ecological Commons

Vinay Gidwani and Amita Baviskar (2013), both experts in equitable urban planning from India where cities have traditionally used commons to cope with the imbalances of rapidly spreading capitalism, distinguish two different types of urban commons, the ecological commons and the civic commons. In ecological commons, natural processes dominate the appropriation of shared resources, as is the case with air, waterbodies, wetlands, landfills. Their value is based on the quality and quantity of natural resource use. Civic commons are commons where human processes dominate the appropriation of shared resources, as happens for instance with streets, sidewalks, public spaces, public schools, and public transportation. The value is based on social use or labor use. Both types of urban commons are essential in mitigating climate change and socio-economic inequalities.

Jose Ramos et al. (2016) go further in the typology of urban commons, highlighting the difference between inherited and created commons. The authors further differentiate these two categories of commons in terms of what is material and what is immaterial. They define 'inherited immaterial commons' as language and culture. These resources can be passed on from generation to generation and still preserve their original form or influence, meaning these resources are intergenerational. Ramos et alii define 'created immaterial commons' as information, knowledge, and digital data. These resources are created by specific generations at a given time, and they are harder to pass on between generations. The same typologies are used for material commons as well. Inherited material commons are natural resources that have existed since the creation of the earth, as for example oceans, forests, and the atmosphere. In contrast, created material commons are manufactured or anthropogenic natural resources produced in specific local places, such as crops or whatever else gardeners or farmers produce for their specific needs.

The P2P organization run by Michel Bauwens, Charlotte Hess, and James Quilligan (2017) has its own categorization of the urban commons. Its categories of commons are based on common spaces or resources found in different ecological environments, such as the noosphere, biosphere, and physio-sphere, as well as types of common resources, such as inherited commons, immaterial commons, and material commons. Their Wikipedia page classifies any commons in the noosphere as indigenous culture and traditions, community support systems, social connectedness, and voluntary associations. Commons in the biosphere are classified as fisheries, agricultural landscapes, forests, ecosystems, parks, gardens, seeds, food crops, genetic life forms, and species of plants and animals. Commons in the physio-sphere include elements, minerals, inorganic energy, water, climate, the atmosphere, and the stratosphere. All of these commons coming from specific ecological environments can be classified as inherited commons, which have been passed on from generation to generation. Inherited commons, such as bodies of water or natural parks, have been under attack for many years due to economic development and capitalist tendencies by enterprises using natural resources for private gain. They are now becoming known as 'scarce commons'.

In his book *Urban Design, Green Dimensions* Moughtin (2005) categorizes different types of ecological commons that exist within cities. To begin with, the author identifies different types of parks in cities, specifically urban parks, country parks, and formal gardens, including designed landscapes in urban areas. The typology he uses is based on the suitability of urban planning purposes and open space strategies in cities. The next category in his typology is the amenity greenspace, particularly in residential areas. This includes informal recreational spaces, housing green spaces, domestic gardens, village greens, and other incidental spaces in urban residential areas. The third category of his typology are community-based green spaces, which include allotment gardens, community gardens, and city farms. The fourth category comprising Moughtin's typology are the natural and semi-natural urban greenspaces. These comprise woodlands (including coniferous, deciduous, mixed, or scrubbed lands), grassland (including down-land and meadow), heath, moor, wetlands (including marsh or fen), open and running water, wastelands (including disturbed ground), and bare rock habitats (including cliffs, quarries, and pits). The last category concerns the green corridors, which include river and canal banks, road and rail corridors, cycling routes within towns and cities, pedestrian paths within towns and cities,

permissive paths, and rights of way. Moughtin's book offers a vast and expansive understanding of very specific ecological commons that are found and used in cities. Putting all of these typologies together allows us to expand greatly the category of ecological commons which surely should be added into our urban-commons categorization matrix.

2.4.2. Social Commons

Susser and Tonnelat (2013) categorize three types of urban commons according to their own unique social constructs. These are urban commons set up by traditional social movements in labor and public services, urban commons that arise from new social movements in public spaces, and urban commons with collective urban visions of art and culture. In the first category, the creation of urban commons is driven by social movements tied to the mobilization of labor and issues of collective consumption. In this case inhabitants or workers collaborate together to pursue a common interest, which often results in these people having access to spaces that provide a higher quality of life through the utilization of a sustainable social organization. Those kinds of movements have thrived for much of the 20th century, where labor organizations such as trade unions or social clubs offered members a support network rooted in solidarity and collective self-organization. The second category is based on newer social movements promoting public space as a commons. Such spaces have been argued to appear particularly in public infrastructure, such as streets, squares, train stations, cafes, public gardens, and other kinds of space where groups of random urban citizens congregate to obtain social benefits. This category is similar to the first one, but the demand for such urban commons is based on open access rather than specified political social gatherings. The third category is based on the need for cultural awareness through the promotion of art. These art-based spaces provide certain visions which urban inhabitants fabricate both individually and collectively to illustrate the culture of their urban identity. Putting all these three categories together, one can conclude that they all arise from social movements demanding better living conditions in their neighborhood, as well as more transparent and democratic management of their urban resources. Such urban commons portray the social needs of an urban population, while also providing needed resources to urban inhabitants in a sustainable manner. This paper by Susser and Tonnelat is unique in its methods of categorizing urban commons. Instead of distinguishing physical features and uses of the space, it explores the social constructs that arise

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from different kinds of urban commons. An emphasis on social movements and art, both concepts we have not seen in other papers, helps us expand our understanding of urban commons. As such, this paper adds a unique dimension on how we can categorize the different types of urban commons.

In this section, we should also look for a type of urban commons that focuses on the social aspect of commoning specifically addressing socio-economic and socio-political issues of certain urban areas. Ecological commons have been defined to show objectives guided towards preservation and rehabilitation of nature. But there is another important side of urban commons, and that is the social side. In the literature, we determine social commons as the best label for this type of commons. In Mestrum (2017) social commons are defined as spaces, resources, and collective movements focusing on participatory and democratic decision making. For example, collective action is the method used to achieve collective decision making, redistributing the powers of people's actions and interests equitably. Social commons also offer universal protection to its participants in obtaining basic rights and resources that neoliberal capitalism often undermines. At the same time, collective solidarity is developed. People are able to realize their collective interests through these social commons giving them social rights and resources rather than natural resources. This type of commons focuses on fighting social inequality rather than climate change. However, social commons can be also used to gather people in preparation for dealing with the pressures of climate change.

2.4.3. Immaterial Commons

These can be interpreted as resources providing people with human, cultural or knowledge capital as opposed to physical resources. The Belgian peer-to-peer theorist Michel Bauwens, for example, distinguishes immaterial commons from inherited or material commons in his three-fold typology. He goes on to explain that immaterial commons are cultural, intellectual, and often enabled by the internet. Examples of this could be free software or free algorithms that are modifiable by a community of users to do an online task, obtain information, or undertake some transaction. Wikipedia is often cited as the most explicit form of an immaterial commons, because it is a

massive hub of information that is readily accessible to all, but managed, edited, modified and maintained by a succinct group of contributors.

It is therefore important to consider immaterial commons in our typology of urban commons, especially to the extent that online platforms target or engage communities primarily in cities. This is all tied to the notion that online platforms allow activities like P2P commoning to happen, which contributes to how we can transform some online sources into digitial and immaterial commons (De Angelis 2013). And while those activities mirror those found in physical urban commons, forms of collective organization may differ slightly in terms of resource access, co-production of contributions, and enforcement and monitoring of the resource itself. Their more open nature and vast pool of users should be considered when comparing the types of commons that exist online to what we see on the ground. Other immaterial commons can be considered as language, culture, and knowledge, which are tacit forms of commons that are even more complicated to govern than physical commons in their strictest sense.

2.4.4. Access Conditions

In the book *Squares: A Public Place Design Guide For Urbanists*, by Mark Childs (2006), definitions are provided for civic commons, neighborhood or community commons, and private or membership commons, a typology that is essential in explaining the different kinds of social and ecological urban spaces that exist within cities. In addition, these definitions explain how different forms of property rights prevailing within the urban commons framework shape how inhabitants see or use the space.

Civic commons are defined as spaces or resources that provide open access to everyone, and the rights to use that space or resource are roughly equal. The author explicitly highlights the term "civic" as a representation of the relationship of the commons to the settlement as a whole and to the collective value of the commons.

Neighborhood or community commons are shared spaces that contain some form of exclusion for its users, meaning that the users have to abide by some norms that are collectively decided. One

can highlight the difference between civic commons and community commons by observing the nature or degree of relationship between their typical users. While civic commons provide rights to the public, community commons provide rights to a specific group of regulars.

Private or membership commons are defined as physical spaces shared by a limited group, whose individual members enjoy roughly the same level of rights to use the space. Barriers of exclusions are high and often depend on ownership or monetary contribution of nearby properties to use the space. While some private commons are based on nearby ownership of property, other private commons can be based on admission fees, provided that users adhere to a set of behavioral rules which comes with that admission fee.

Childs' book has an equally expansive understanding concerning which specific civic commons can be defined within the theoretical framework of urban commons. Similar to Moughtin's book, the range of urban civic commons explained in this book enriches our understanding of 'social commons' and helps us further expand that category in our matrix. Since civic commons are seen as open-access commons, they can be attributed to both 'ecological' and 'social' commons which widens what kind of urban commons may exist within an area of public or open access.

Putting the literature together, one can identify a clear categorization of urban commons that is determined by its specific function and desired outcome. I separate three main different types of urban commons, which are ecological commons, social commons, and immaterial commons. For ecological commons, we use the definition by Vinay Gidwani and Amita Baviskar (2013), referring to urban spaces where natural processes dominate the function and use of the space. For social commons, we use the definition by Mestrum (2017) as spaces used for democratic decision making to resolve local socio-economic issues within a neighborhood. The definition for civic commons found in Vinay Gidwani and Amita Baviskar (2013) can be used for how we wish to categorize social commons here. That definition is based on spaces where human processes dominate the function and use of the space. This definition works, because here human processes are focused on citizen participation to solve social issues.

For both ecological and social commons, we use the subcategories found in Mark Childs' (2006) book to highlight the different forms of property rights and property regimes which exist within urban commons. In other words, the subcategories for ecological and social commons are civic (open access), neighborhood (community-oriented framework with some forms of exclusion), and private or membership commons (where rights are defined by ownership or admission fee). For immaterial commons, we use the definition found in Jose Ramos (2016) grouping together non-tangible goods passed on from generation to generation in order to expand collectively on culture and knowledge. But this definition is more complicated than that. There is a fundamental difference between inherited immaterial commons and created immaterial commons. In this context, inherited immaterial commons consist of languages and culture, while created immaterial commons consist of software, data, and art. Within social and ecological commons, I divide each category into three sub-categories, which are civic commons, neighborhood commons, and club goods with commons-like features[1]. For the category of immaterial urban commons, we use the subcategories of inherited and created immaterial commons provided by Juan Pablos (2016). The definitions are provided above. Putting all of this together, the categorization of urban commons can be visually presented through Table 2.2.

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[1] I don't use the term 'private' commons simply because that logic does not work within the framework of commons. We cannot mistake commons for private goods. Since some privately-owned resources are shared, I will label them as "club goods with commons-like features".

Table 2.2: The Urban-Commons Categorization Matrix and Description of the Matrix

Type of Commons and Focus	**Ecological**: *focused on natural processes and natural resource production*	**Social**: *focused on human process for equitability and human well-being*	**Immaterial**: *focused on connectivity, communication, and human development*
Civic: *inherited for/by all urban citizens*	- Urban Parks - Natural/Semi-natural urban greenspaces - Urban Ecosystems - Green Corridors (river/canal banks and natural tree trails	- Public Infrastructure (including transportation) - Squares and Plazas - Streets and Sidewalks - Green Corridors (park trails, bike baths, recreational spaces)	- Language - Culture - Internet/Big Data - Art (?)
Community: *Created for a collective use*	- Community Gardens - Subsistence Allotments - Urban Farms - Brownfields Sites	- Community Land Trusts - Occupational Allotments - Guerilla Gardens/Spaces - Business Improvement Districts	- Open Source Technologies - Internet Forums - Peer-2-Peer processes - Urban Cultural Initiatives - Social/Political Movements
Club Goods with commons-like features: *Created for personal use/profit*	- Backyards - Roof Gardens - Amenity Greenspaces - Gated Community Greenspaces	- Shopping Malls - Attractions - Other spaces with admission fees	- Websites with 'premium' membership fees - Software with usage fees - Services

The matrix shows the differences of urban commons through civic, collectively shared, or private property regimes. Civic urban commons are public, owned by a municipality, and therefore maintained by that municipality. These commons are non-rivalrous and non-exclusive, meaning they are open-access commons. Community urban commons have some form of exclusion, but the maintenance and use of those commons are shared by a group of urban inhabitants that make up a community. Club goods, which are private in nature but resemble urban commons in their governance, are used and managed by the owner of that space, and it is he or she alone with the authority to decide who uses the space. Club goods have the highest form of exclusivity among the three categories.

My thesis focuses primarily on the community-based urban commons, because the collective management of the space follows the principles of the solidarity economy and has the strongest ability to mobilize urban communities against the pressures of climate change. The collective use of the space, as shown by Ostrom (2008), is what incentivizes urban inhabitants to follow the rules and norms decided together by the community using the space. Following these norms leads to the sustainable practices that allow inhabitants to reap the benefits of the commons and at the same time preserve the resources that are produced in community-based urban commons. The thesis will touch upon all three types of community urban commons, which are ecological, social, and immaterial urban commons, but will stay focused mainly on the community-based property regimes within the urban commons.

Section 2.5 Urban Commons and Climate Change – Ecosystem Services

The previous three sections (2.2 to 2.4) highlight the relevance of urban commons in the context of today's climate change challenge. In those sections, we have laid out the principles of urban commons and the social innovations they provide for communities to come together. Those characteristics are then put into context with the major challenges cities face. We conclude that urban commons and the social processes that happen in them are imperative to the policies we need to put in place to deal effectively with climate change. Our ambitions in that regard are bound to become increasingly urgent as we face exponentially more grave consequences to the habitability of the planet from climate inaction.

The problem we have is one of inaction. We have a fossil-fuel-based economy which we have to replace with renewables as energy source and more sustainable practices as well as products. Initially that is bound to be a rather disruptive and costly process of transition before we as a society can reap the benefits of such a large-scale effort later. Climate change presents what Bank of England governor Mark Carney (2015) in a famous speech to insurance companies has referred to as a "tragedy of the horizon," referring to a mismatch in time horizons (between, say, imminent costs and later benefits from climate change mitigation) which impacts on incentives and rewards. Politicians, shaped by relatively short election cycles, do not want to impose costly mitigation measures whose benefits only come to fruition when they are no longer in office. Investment

horizons of profit-motivated actors are also likely stuck in short-termism. As a matter of fact, if we look at the planet's ecosystem as one giant commons, we can think of the capitalist economic system as motivating "over-grazing" by individual profit-seeking actors and as such itself a "tragedy of the commons." Climate change is also a global coordination problem, prone to free-riding by countries less willing to commit to action than others, while poor countries least responsible for greenhouse gas emissions are often located in regions affected most by the ravages of climate change and therefore most in need of help. Endless arguments over these distributional and free-rider challenges have held up progress with regard to putting in place global governance mechanisms against climate change and/or making them work effectively.

There is thus a collective bias in favor of ignoring or downplaying this problem. We have known about climate change as a threat for thirty years without doing much about it at all. But the problem is both cumulative and exponential, thus getting progressively worse over time. We are approaching rapidly tipping points – the irreversible destruction of the Amazon rainforest, the melting of the polar ice caps, the thawing of the permafrost layer covering much of Canada and Russia which risks releasing enormous quantities of methane gas – whereupon the trajectory of the global-warming dynamic threatens to accelerate dramatically. In other words, we are at a critical junction where large-scale, sustained, coordinated action is necessary. Amidst hesitant and fiscally overstretched government officials, politicians concerned with reelection, financial investors concerned with the short-term risk-return trade-offs of their portfolios, firms under competitive pressure to create profits, and managers biased towards the short-term thanks to bonuses and stock options tied to current performance, none of the key actors have been able to make climate change mitigation their priority.

This collective inaction in the face of a growing systemic threat, a combination of market failure and government failure without precedent, promises to be especially critical for cities. These are the densely populated spaces emitting lots of greenhouse gases, but also much exposed to the climate change threats of rising sea levels, storms, floods, heat waves, droughts, and wildfires. Just look at how Hurricane Sandy ravaged critical infrastructure in New York City in 2012, with power plants getting knocked out and subway tunnels getting corroded by saltwater floods. Cities are also structurally problematic because of the capitalist system's inherent inequalities also acquiring a

spatial dimension disadvantaging large population concentrations in terms of forcing them to live in impoverished and underserved neighborhoods subject to greater environmental racism, less green space, and more hotspots. As they come to understand climate change as the existential threat it is rapidly becoming, cities can plead for resources from upper echelons of the nation-state and try to regulate or cooperate with the business community. But to the extent that the objective of achieving carbon neutrality over the next few decades requires them to transform spaces, structures, and social organization, cities have to mobilize their inhabitants into sustained action. Many of the specific actions needing to be taken are better taken care of with active citizen involvement, perhaps even benefitting the most on the neighborhood level from collective-action initiation. This justifies creation of urban commons as effective vehicles.

In the preceding section, we have presented a classification matrix categorizing different types of urban commons not least to demonstrate how broadly we can and must define them so that we can imagine them as a major force in the fight against climate change. We are not only focusing on ecological commons, an obvious choice in light of having to address a fundamentally environmental challenge, but also on social commons fostering group mobilization and engagement as itself a resource to build upon and immaterial commons as producers and distributors of collectively elaborated and widely disseminated knowledge. Along the second vector of our 3 x 3 urban-commons classification matrix we have identified community-based commons, situated between open-access ("civic") and membership-based ("private") commons, as especially appropriate in the context of climate policy, because they mobilize a finite group of obviously linked citizen-activists targeting a specified urban area through collective action for shared resource creation and maintenance on the basis of agreed-upon rules of access as well as norms of behavior.

But none of these categories matter for urban climate policy unless and until we know what they are supposed to do. When we discuss urban commons as indispensable force against climate change, at this point still nothing more than this or that case study illustrating great potential, we need them to be inexorably linked to ecosystem services denoting the public and private benefits we can draw from nature and the ecosystems in it. Rather than just thinking of greenhouse gases as pollution and treat them as such like an externality (see, for instance, the debates over carbon

pricing via emissions taxes or cap-and-trade schemes), downplaying in the process the systemic threat they represent, we need to treat their elimination as an ecosystem service of the highest order and restructure our economic system accordingly. In other words, we need to rethink the concept of ecosystem services. We need to reconnect economic activity to its social setting and then re-embed that socio-economic web of actions and actors with nature as a setting to preserve.

2.5.1 Rethinking Ecosystem Services in the Context of Cities

We argue here that urban commons can enrich the ecology of a bioregion, something that cities depend on to care for their urban population. The core of our argument is that urban commons are ecosystem service providers, and they provide the basic natural resources that people depend on. Such provision is done within an urban setting and at the local level. We need to define ecosystem services and explain their benefits for urban populations, strengthening our argument with concrete examples for illustration. But before doing so, we will want to address some well-known criticisms of ecosystem services and see how those apply when linked to urban commons as their delivery platform and city dwellers as their beneficiaries.

The term "ecosystem services" gained widespread usage about fifteen years ago thanks to the United Nations-sponsored Millennium Ecosystem Assessment (MA) report (2005) assessing the human impact on the environment. The MA report, while emphasizing the benefits humans have derived since the beginnings of their existence from their natural environment and the healthy ecosystems it contains, also points out the nefarious effects of human activity degrading these ecosystems to a point where their continued reproduction is no longer assured. A similar conclusion can also be drawn from a European Commission database known as BISE (for Biodiversity Information System of Europe), set up as part of the EU Biodiversity Strategy to 2020, whose detailed data collection points to continuous and accelerating biodiversity loss across the continent (https://biodiversity.europa.eu). It should be noted that BISE addresses the challenge of climate change directly with inclusion of a Green Infrastructure (GI) link a portion of which is dedicated to urban areas providing for such hybrid ecosystem services as green façades or roofs on buildings, green courtyards, sidewalks, streets, parks, urban forests, biodiversity-rich business

parks, and so on. Both initiatives of the UN and the EU have popularized the notion of ecosystem services.

However, ecosystem services are not without controversy. Schroter et al. (2014), for example, offers three types of arguments against the concept of ecosystem services. The first kind of objection is based on the ethical considerations that demonstrate the relationships and interactions between humans and nature. The second area of attack against traditional ecosystem services pertains to strategies developed in the interface between science and policy applied to the conservation and sustainable use of ecosystem services. This includes potential conflicts between the need to preserve biodiversity and the commodification of ecosystem services which subjects biodiversity to a capitalist logic of valuation from which payments can be drawn. And, thirdly, we can also take a critical look at the current use of ecosystem services within a scientific approach. These three types of criticisms raise the question how urban commons can respond to such criticisms found in the literature of ecosystem services. We shall review here several arguments typically raised against ecosystem services to show how valid they may or may not be when ecosystem services get connected to urban commons.

One criticism has to do with environmental ethics. It stresses the excessively anthropocentric focus of ecosystem services according to which humans will only have the incentive to preserve nature if they can derive an economic benefit from such preservation (Sagoff 2008) and hence end up losing sight of the intrinsic value of nature itself (McCauley 2006). As a result, we fail to appreciate that humans need greater levels of biodiversity to thrive and that depletion of natural resources threatens our survival. This bias, possibly driven to extremes in advanced capitalist economies, calls for a more bio-centric vision capable of appreciating the intrinsic values of nature (Callicott 2006; Tax et al. 2013). However, when linking ecosystem services to urban commons, the argument becomes more nuanced. Cities, after all, are entirely created by humans and for facilitation of human life, thus by definition anthropogenic. Ecosystem services that come from urban commons are by definition anthropogenic, because urban commons result inherently in artificially produced nature benefitting the human beings living in these urban spaces. Krebs (1999) claims that ecosystem services may add to human aesthetic contemplation, which gives value in itself to our global ecosystem. The inherently managed nature of ecosystems found in

cities lends itself to argue that anthropocentric values would best be suited to tackle depletion of our ecosystem (Reid et al. 2006; Skroch and Lopez-Hoffmann 2010). Chan et al. (2012b) even argue that a broad range of anthropocentric arguments actually favor the protection and sustainability of human use of ecosystems, an argument favoring urban commons as facilitators of access to nature's aesthetic side as well as producers of natural resources within bio-regional spaces modified by urban development

Another criticism is based on the relationship between humans and nature itself. Scholars have shown that relying on ecosystem services as a source of economic production may entice people to exploit natural resources in a harmful and unsustainable way (Fairhead et al. 2012; Raymond et al. 2013). Such harmful behavior stems from people relating to nature in a consumptive way (Brockington et al. 2008). To the extent that ecosystem services become more attainable in this dynamic, people will become increasingly separated and alienated from nature (Robertston 2012). This will decrease people's motivation to preserve nature and use it sustainably for economic production. But with urban commons this criticism simply does not hold. Because of the urban fabric, people are already disconnected from nature. On the contrary, ecosystem services from urban commons can have a positive impact as concerns our relationship with nature. Urban commons can reconnect city dwellers with nature, because nature becomes accessible near their doorstep. Urban commons can become hubs for sustainable use of our biodiversity, primarily because their aim is to regenerate the flora and fauna of the local bioregion which economic development had excessively modified away from nature. To the extent that the provisioning of ecosystem services from urban commons leads to more access to basic resources and augmentation of the quality of life, people will have an incentive to preserve the natural forms that exist in urban commons. Self-governance and collective action may in this context help incentivize sustainable provisioning.

McCauley (2006) and Ridder (2008) have pointed out that efforts to obtain ecosystem services might arise out of growing economic demand for these services without any environmental consideration of safeguarding biodiversity. Such a narrow focus is quite worrisome when we should urgently prioritize protecting our environment (Cardinale et al. 2006; Norgaard 2010). But this argument of ecosystem services de-linking from the goal of biodiversity preservation is

unlikely to hold in the case of urban commons. In areas of dense urban development, the bioregion has already been modified, and urban commons within these modified areas providing ecosystem services do so typically with the explicit objective of preservation or recreation of biodiversity. They may increase the local flora and fauna of a bioregion in places where those had been extracted a long time ago. They may also provide habitat services derived from the maintenance of life cycles, migratory species, and genetic diversity (De Groot et al., 2010). And having urban commons in areas where people live will attract attention to the local bioregion a city is located in, augmenting concern and discussion of its state.

Questions have been raised about the valuation of ecosystem services to the extent that they are framed through the forces of the marketplace. Sagoff (2008), for example, states that attributing valuation to ecosystem services is the equivalent of putting an economic value on the sun, wind, and gravity. Putting such values on the environment may lead to an inadequate assessment of how vital nature and biodiversity is not only to our everyday lives, but also for our existence as a species (Chee 2004). In order to protect nature, scholars claim that we may have to move away from putting some form of economic valuation on ecosystem services. This also applies more broadly to the commodification of ecosystem services. Scholars, such as McCauley (2006) and Turnhout et al. (2013), have expressed fears that economic valuation of ecosystem services would entice humans to sell nature in a commodified fashion, leading to an accelerated degradation of natural resources. Urban commons, if anything, allow people to escape the capitalist logic of market-based valuation and commodification of nature. For example, commons-based sustainable urban farming techniques may procure healthful foods cheaply in an urban resident's backyard and thereby lower the demand for, as well as profitability of, environmentally destructive agrobusiness products.

As a result, nature ends up less commodified. Urban commons also have the educational benefit of raising consciousness for people to understand better the trade-offs between private benefits and public costs of our ecosystem, along with short-term and long-term consequences (De Groot et al. 2012). They will also highlight the undervaluation of positive and negative externalities that come from nature itself. There may well be more of an incentive to protect nature when such properly grounded value systems are included in policy making and economic planning (Skroch and Lopez-Hoffmann, 2010; Lamarque et al. 2011; Gomez-Baggethun and Ruiz-Perez 2011).

The definitions and classifications of ecosystem services contained in the report of the Millennium Ecosystem Assessment of 2005 have been criticized as too ambiguous and inconsistent (Nahlik et al. 2012). But the MA may have kept those intentionally vague to encourage creativity, intellectual progress, and facilitation of a broad range of uses and interpretations depending on the local setting or condition (Carpenter et al. 2009). Organizations like The Economics of Ecosystems and Biodiversity (TEEB) or the Common International Classification of Ecosystem Services (CICES) have been able to specify their own more concrete versions of these definitions, which has led to more progress in defining the concept in and of itself (De Groot et al. 2010). The imprecision has also spawned new proactive ideas on how to use this concept to achieve the goals of socio-economic solidarity and climate change mitigation (Wallace 2007). It has also facilitated cooperation without the need for a consensus between groups and disciplines following different paradigms (Strunz 2012). For example, the vagueness of the ecosystem service concept has provided a basis for dialogue and cooperation between economists, scientists, researchers, and policy makers. Furthermore, the ecosystem service concept is still in its development phase. So, in order to achieve intellectual and practical improvement of the concept, it has to start off from a more generalized base in order to evolve. After all, it is perhaps because of the concept's lack of precision that urban commons have been able to fit in the ecosystem services concept so as to become their main providers. And as a result, the concept remains adaptable for a variety of stakeholders to maintain their identities across themes, contexts, and networks when using ecosystem services and maintaining the spaces that provide them (Starr 2010).

Some scholars, such as Sagoff (2002) or Zhang et al. (2007), have taken issue with the overly optimistic assumptions associated with the ecosystem service concept which portray the relationship between nature and human well-being as strictly positive and all such ecosystem services as good and desirable. Those biases may distort research by environmental scientists and/or feed unhelpful normative assumptions about our ecological crisis. Urban commons are well equipped to address any such biases. If there are ecosystem disservices in direct connection to natural areas, such as plants causing allergies, decrease in air quality, block of views, maintenance costs, infrastructure damage, introduction of invasive species, or displacement of endemic species, urban commons may prove an effective organizational tool to keep these negative environmental

sources out of their neighborhoods through collective action. And a normative approach may be quite constructive in raising standards of preservation or coping with the dangers of climate change.

In conclusion, we can see that a large portion of the standard criticisms against ecosystems services can be debunked, when we connect them with and apply them to urban commons. As a scholar aware of these well-documented criticisms, I have responded to them by showing how the concept of ecosystem services gains more positive qualities when embedded in urban commons. This is especially true when using urban commons as providers of ecosystem services for climate change mitigation. Urban commons strengthen the positive arguments of ecosystem services, especially to the extent that they represent spaces of nature which are produced in already heavily modified bioregional and urban areas. But for the concept to gain further legitimacy, ecosystem services need to be more researched so that the positive outcomes become more achievable for urban residents and policy-makers who seek to reap the benefits of urban commons while combating the pressures of climate change. The concept, still being in its development phase, needs to evolve further. To help with that objective, let us take a brief look at different types of ecosystem services and their respective relevance for the urban context in the face of climate change.

2.5.2 Provisioning Ecosystems Services in Urban Commons

The Biodiversity Information System of Europe (BISE) categorizes ecosystem services as either provisioning services, regulating services, habitat services, or cultural services. Provisioning services are the goods that are obtained directly from the ecosystem and consumed directly by humans who inhabit the bioregion. Such services include food, wood, minerals, freshwater, and other consumable organic goods. Regulating services are goods and benefits that are obtained when populations focus on regulating their ecosystem processes. The benefits specifically come from climate change regulation, natural hazard regulation, water purification, waste management, pollination, and pest control. Habitat services are natural resources in the environment that provide breeding and feeding grounds for migratory species, or they can be represented as dynamics existing within a natural bioregion to balance and maintain a gene pool for local flora and fauna. Habitat services are very important for various physiologies of bioregions that exist all around the

world. Cultural services are the immaterial goods and benefits that people gain from learning and using the environment, eventually incentivizing the population to maintain the environment. Examples of cultural services include spiritual enrichment, intellectual development, recreation, and aesthetic values. Each of these four categories of ecosystem services can be mobilized with the help of urban commons and directed towards the objective of climate change mitigation or adaptation.

Since the majority of the population today lives in cities, there has been an increased focus on locally provided ecosystem services in urban areas. In this context, urban commons can play an important role and so contribute to the fight against climate change. In urban areas, public access community gardens and allotment gardens have proven to be particularly rich in biodiversity and the provision of ecosystem services (Andersson, Barthel, & Ahrné 2007; Gardiner, Prajzner, Burkman, Albro, & Grewal 2014; Matteson & Langellotto 2010). Both garden types use unconventional techniques of farming, such as permaculture, hydroponics, vertical farming, and other forms of sustainable growth techniques, to maximize the yield in a very limited space.

Modern agriculture requires enormous fields, irrigation, pesticides, and artificial fertilizers while also burning enormous amounts of fossil fuels to transport these foods to the cities where most people live. This industrialized monoculture farming is quite damaging to the environment, thus becoming an ecosystem disservice (EFTEC 2005). But now we can see a shift towards urban local agricultural production which can improve food security for city dwellers, especially communities living in low-income areas. Scholars have argued that public access community gardens and allotment gardens have resulted in improving food security, especially for the urban poor (Zezza & Tasciotti 2010). Urban gardens as sources of food production have been crucial for city dwellers in places like Kenya, Tanzania, China, and Taiwan (Smit and Nasr, 1992) and have contributed to food security for cities during times of scarcity for many generations (Barthel and Isendahl 2013). Urban commons provide families with a greater variety of dietary good and calorie consumption, leading to greater health and savings for many families (Zezza and Tasciotti 2010). They are also remarkably productive. A study by Algert, Baameur, & Renvall (2014), for example, found that urban gardens produced 0.75 lbs./square foot of vegetables, compared to 0.60 lbs/square foot in conventional farming systems. The increased yield per square foot is due to the intensive

management practices found in urban commons which include intercropping, vertical cropping, hydroponics, soil building and sustainable maintenance of the soil and growth of the flora. People learn certain gardening skills to achieve these intensive practices and in the process turn urban gardens into hubs of ecosystem services, including adding to the sustainability of certain flora we deem valuable.

Water management is another provisioning ecosystem service which urban commons provide usefully in the fight against climate change. Since there are a lot of impervious surfaces in cities due to pervious materials being compacted or disturbed, such important tasks as rainwater catch and water infiltration are quite an ordeal. Urban gardens serve as spaces to infiltrate water whose intensive practices, like adding soil and vegetation in typically impervious spaces such as rooftops or parking spaces, can lower storm-water runoff (Olson & Gulliver 2011; Glanville, Richard, & Persyn 2003; Harrison, Grey, Henry, & Xue 1997). Such reduction in storm water runoff, which means less water pouring into streams, leads to lower peak flows and higher base flows of streams for greater environmental balance pertaining to this natural resource. Better regulation of water flows and rainwater absorption also reduces the risk of uncontrolled flooding in cities (Baro et al. 2014; Bound and Hunhammar 1991). Rainwater collected through these systems can provide water for irrigation in urban commons (Smit and Nasr 1992). The increase of pervious surfaces also reduces the likelihood of combined sewer overflows, making the sewer system more functional and hygienic (Novotny, Ahern, & Brown 2010).

Urban commons can also facilitate groundwater recharge, which makes more usable freshwater available to city residents. Urban agriculture can benefit from utilizing excess storm-water runoff by implementing catchment systems. For those it would be useful to have a first-flush system, where the first portion of water entering rainwater catchments is removed in order to flush out any pollutants or particulate matter coming from rooftops and building facades (The Freshwater Society 2013). In addition, testing paradigms should ensure that no chemicals are entering the crops, and the food remains edible (Moglia 2014). When adding these two relatively cheap systems into an urban garden, the synergies between rain water catchment and urban gardens can serve as a very inexpensive and efficient intensive practice. It can thus be seen as a replacement for our irrigation systems, which require a very costly water treatment process. Because there is less storm

and sewage runoff, public health improves significantly for residents living nearby. Furthermore, sustainability is improved as a community's food system uses virtual water storage instead of using transportation (Liebman, Jonasson, & Wiese 2011). Water infiltration is the best way to achieve this goal of sustainability, by adding composting sites, maximizing garden space, and using deep soil tilling (Olson & Gulliver 2011; Harrison, Grey, Henry, & Xue 1997). It is important for urban gardens to link up to decentralized rainwater catchment systems and wastewater recycling systems in order to localize the water source. All this makes water usage in cities much more sustainable, crucial preparation for our struggle with climate change which, among many challenges, essentially boils down to a problem of proper water management.

Soil management is another provisioning ecosystem service which urban commons provide to their local population. Soil management associated with public access community gardens and allotment gardens increases the soil nutrient content, while also reducing soil bulk density, in support of beneficial bio control interactions. Edmondson, Davies, Gaston, & Leake (2014) report urban commons to exhibit healthier levels of soil than conventional monoculture farming sites, particularly in soil organic carbon rates, carbon to nitrogen ratio, total nitrogen, and bulk density. The same authors conclude that the intensive practices and growing techniques used by urban commoners, such as compost produced on-site, woody vegetation, and application of organic materials like manure, result in healthier soils. Woody vegetations in particular provide certain benefits, such as deep roots that improve the de-compacting of soil, while leaf litter produced by woody vegetation serves as a habitat and nutrient provider for birds, insects, and other forms of life contributing to enriched organic matter and soil as they decompose (Davies, Gaston, & Leake 2014). Positive externalities arising from these practices include providing healthy habitats for beneficial species, especially for insects and microbes that prey on pests (Yadav, Duckworth, & Grewal 2012). These habitats also support plants in gardens that reduce the risk of pest infestations. According to Balousek (2003) and Harrison, Grey, Henry, & Xue (1997), soil tilling decreases the bulk density, which in turn improves the infiltration of water into the ground. Urban commons also have many composting sites. Therefore, soil management in urban commons can serve as a form of waste management in the disposal of organic waste that is useful for other functions (Bolund and Hunhammar 1999; Gomez, Baggethun, and Barton 2013). For example, waste treatment

functions in urban commons can serve as decomposing sites for urban wastes and effluents. They can absorb nutrients from wastes and, as a result, reduce the costs of waste disposal in cities.

In this section, we see that ecosystem services can be tools used to implement properly effective climate policy where cities can become hubs of the zero-carbon net economy. By implementing more of these ecosystem services, carbon is sequestered a and biodiversity is expanded. Commons become producers of these ecosystem services by nature of what they are and the urban resources they manage. And those ecosystem services are planted in areas of the city that the government doesn't have outreach for. This makes the implementation of ecosystem services far more vast and impactful. This also gives support to the argument that urban commons are capable of having an effective impact on climate change resiliency in cities, which is the central argument to my thesis.

This section also shows that urban commons are also capable of producing these ecosystem services from scratch just by implementing soil and plant management in vacant spaces, which means the cost of ecosystem service production by commons is very low. It is true that some governments focus on ecosystem service production at the heart of densely urban areas, such as the project in Paris to renovate the Champs Elysees as a green space for over 250 million euros, with far more tree cover in heavily congested and polluted areas, as seen in Willsher's (2021) article in the Guardian. But such projects ignore the potential ecosystem services that could be produced in other densely populated areas of Paris and its surrounding suburbs. That is where urban commons can fill that void of producing ecosystem services where other sectors could not. And ecosystem services produced at the local level may have a greater overall impact in reducing the effects of climate change than top-down public or private projects like the one proposed in Paris.

There are also specific aspects about how the urban public and private sphere is managed that make it less adequate than commons in providing ecosystem services to all populations of a city. On the one hand, those specific aspects include government bias to profit-making projects that prioritize development above else. Since city governments are managed in a top-down hierarchical form, it makes designing those projects complicated in terms of having ecological benefits reach all communities in all areas. Thus, they have a limited scope of what resources to invest in and

what budgets they can have to manage those resources. Bureaucratic burdens that are by nature always tied to governments may also hinder the progress of any projects based on ecosystem service production.

Markets on the other hand have a profit bias, and they may commercialize the notion of ecosystem services by trying to put a price and gain a profit margin, and the markets only respond to those willing to pay for it. This too hinders on any process that would allow ecosystem service creation to reach all levels of the urban population. When combining these two together, one can see that neither markets or state are adequate enough to responding to the weakest demographics pushing from below, because they both respond to power. Therefore, a lot of places where ecosystem services should be set up won't necessarily happen. There is thus a very clear argument to be made for urban commons as better producers of ecosystem services, at least within the scope of the city, than both the public and the private sector. And that argument starts with the advantage that urban commons produce ecosystem services from the ground up and across a wide range of neighborhoods positively impact a wide range of communities in several urban areas. And they can be produced without any overriding budgets that are often seen in government-issued projects.

To conclude, urban commons provide several crucial provisioning ecosystem services, from food production in urban gardens to water management and soil management, which improve the quality of life and accessibility of important resources for city dwellers. Those services can have a direct impact on climate change mitigation, supporting our argument about the importance of urban commons as a solution for cities to combat the pressures of a warming planet.

2.5.3 Regulating Ecosystems Services

So-called regulating ecosystem services make a crucial contribution to the systemic self-regulation capacity of nature and in terms of connecting natural phenomena in balanced fashion. We have seen from the recently noted catastrophic declines of the world's bee population, a phenomenon the National Geographic has termed "colony collapse disorder," how crucially important their role in pollinating flowers is to our food supply. Just to give an example of this crisis, Woods (2021) reports that bee keepers across the entire United States saw a 45.5% decline in the populations of

bee colonies between 2020 and 2021. A full 70 of the 100 crops providing 90 percent of the world's food supply rely on bees for pollination. Bacteria decompose wastes. Plants filter water and clean air. Tree roots prevent soil erosion while also promoting water infiltration. Such regulating services keep our ecosystems functional and contribute crucially to their sustainability. While we can easily grasp the importance of pollination, decomposition, water and air purification, and prevention of soil erosion, regulating ecosystem services also play an absolutely vital role in climate change mitigation to the extent that they help regulate the climate, store carbon ("carbon sinks") and control floods.

Since greenhouse gas emissions have risen rapidly and continuously to dangerously high levels, the world has come to focus intensely on a crucial regulating ecosystem service which is carbon sequestration. Intensive gardening practices focusing on woody vegetation and soil result in sequestration of carbon dioxide in dense urban areas where pollution levels are high. In addition, such forms of vegetation provide cool and shady micro-climates, which are essential during periods of surging temperatures (Bolund and Hunhammar 1999; Chaparro and Terrades 2009). Urban gardens replace impervious covers for vegetation, while simultaneously sequestering carbon. Having these shady micro-climates also reduces the need for artificial heating and cooling in buildings, lowering the carbon footprint of each building. This leads us to conclude that urban commons are effective in regulating temperatures in cities. Micro-climates provide cooling effects in the summer (Bolund and Hunhammar 1999; Chaparro and Terradas 2009).

A study by Kulak, Graves, & Chatterton (2013) of carbon sequesters in cities all around the UK found that urban gardens in peri-urban areas would reduce greenhouse gas emissions in the city by up to 34 tons per hectare. Another study taking place in Boston by The Conservation Law Foundation and CLF Ventures (2012) found that converting 50 acres of city land into ecological urban commons would sequester 114 tons of carbon dioxide into the soil. When taking into account that kind of impact from regulating services, we can conclude that urban commons will help cities decrease their greenhouse gas emissions and adapt to the pressures of climate change.

Another regulating service reducing greenhouse gas emissions arises when moving from industrialized monoculture farming practices to localized urban farming practices existent in urban

commons (a shift already discussed first in section 2.5.2). Since food production has been relocated towards urban gardens, cropped goods are produced right where they are consumed. Such dramatic shortening of the food chain leads to a reduction in its carbon emissions, since there is less transport of agricultural goods from rural farming areas to urban areas (Heller & Keoleian 2003). Emissions are also reduced when consumers of agricultural products, particularly families living in urban areas, will travel much less to go to their garden plot to obtain agricultural resources (Pretty, Ball, Lang, & Morison 2005). Of course, all this adds to the broader benefits from urban garden practices in terms of reducing the vulnerability of families with regard to food prices or other economic shocks, while increasing urban biodiversity and reducing on-site greenhouse gas emissions (Dubbeling 2014). Organic farming techniques practiced in public access community gardens and allotment gardens create carbon sequestration pockets in cities, while releasing less emissions than traditional farming techniques. Organic practices fostering the production of locally grown food reduce farming costs while improving local biodiversity and access to food resources for families (Pretty, Ball, Lang, & Morison 2005)

In addition, organic farming in urban gardens usually minimizes the application of synthetic fertilizers, a major contributor to greenhouse gas emissions, and promotes the use of water-efficient irrigation systems (Schramski, Jacobsen, Smith, Williams, & Thompson 2013). Urban gardeners will have the incentive of selecting high-yield crops that thrive in the local climate. In other words, crop selection can have a huge impact on climate change mitigation (Kulak, Graves, & Chatterton 2013). Taking into account all of these climate change mitigation mechanisms together, urban commons contribute to a city's reduction in greenhouse gas emissions.

Cities also face a huge challenge of having to reduce air pollution from industries, vehicles, and domestic emissions. Many of these pollutive factors are health hazards to people living in cities. In response to this challenge, cities have tried to grow as many trees in urban areas as possible. The more trees there are, the more effective urban areas are able to regulate air quality levels (Bolund and Hunhammar 1999). Trees serve as absorption pockets for greenhouse gases like ozone, sulfur dioxide, nitrogen dioxide, and filters for air pollution (Baro et al. 2014). Urban commons can be hubs for tree growth, making them perfect platforms for cities to increase the amounts of trees in urban areas. Increasing the amount of tree species and structure of vegetation

also enhances the effectiveness of cities in responding to air pollution concerns. Another challenge cities face is noise pollution. Green cover provided by urban commons reduces noise pollution caused by human activities, because the sound waves are absorbed, deviated, and refracted when trees are present (Nowak and Dwyer 2007). When there are more trees in a given area, the sound waves get dispersed onto other trees, an effective way to buffer the nauseating sounds which permeate urban areas (Nowak and Dwyer 2007).

Pollution is but one challenge cities face with regards to climate change. Natural disasters are a major concern as well, as many cities have suffered catastrophic weather events causing billions of dollars in damage and even deaths. Urban commons can be a source of protection from natural disasters like hurricanes, storms, and floods. Green spaces near bodies of water can be protective buffers against floods (Walton et al. 2006). When heatwaves become a threat to city dwellers, urban commons can provide cooler spaces and lower temperatures in cities (Solecki et al. 2005).

2.5.4 Urban Commons as Providers of Habitat

Habitat services increase the biodiversity, bio-productivity, and ecological connectivity of a certain urban space within a bioregion. Urban commons create habitat for insects, birds, microbes, and mammals that are native to the local bioregion of the city (Savard et al. 2000). More animals in an urban area contribute to a healthier environment of the city, particularly because such species can be seed-dispersers, pollinators, decomposers, and predators to a variety of pests that may exist in urban commons (Andersson, Barthel, & Ahrné 2007; Yadav, Duckworth, & Grewal 2012). Such species are extremely important in providing crucial ecosystem services both to the individual urban commons as well as to the ecosystem of the city.

Structural features in an urban garden, such as species composition, pervious areas, and trees, as well as the managerial practices to nurture these structural features lead to a proactive approach to preserve the local biodiversity. For example, an open garden with several flowers will increase the population of bees and butterflies, both species that are essential contributors to the biodiversity of the ecosystem (Matteson & Langellotto 2010). A study by Matteson, Ascher & Langellotto (2008) found that the presence of urban agricultural gardens in New York led to findings of 54

different species of bees and became an ideal habitat for an abundance of arthropod species. The result of an increase of these species is the formation of naturally occurring 'biocontrol' interactions, where predator insects and microbes prey on harmful pests. They also serve as an indicator of healthy soil food webs and may serve as a control for chemicals (Yadav, Duckworth, & Grewal 2012). Greater presence of these species will also attract many additional species of birds and other arthropods, which are important contributors to the ecological productivity and health of a bioregion.

A paper by Dearborn and Kark (2010) identifies seven mechanisms that increase the biodiversity of a city through the use of urban commons. The first is the preservation of local biodiversity that is otherwise threatened by urban development and urban sprawl. The second is the provision of flora and fauna in urban areas that are only found in rural areas, contributing to the overall connectivity of a bioregion. The third is understanding and facilitating species' responses to environmental change so as to preserve the species in urbanizing areas. The fourth is providing a greater audience with the proper education they need to understand and nurture natural processes within the urban area of a specific bioregion. The fifth is facilitating natural processes that increase biodiversity, such as pollination of bees, seed dispersal by birds, or natural air purification by trees. The sixth is allowing urban residents to become good stewards of the land and adapt ethical responsibilities to nurture the local environment. The seventh is improving the overall well-being of urban residents both in a physical and psychological sense. Following these mechanisms will not only allow an urban population to gain access to essential natural resources for survival, but also help it gain knowledge about the local bioregion so as to preserve it for future urban generations.

2.5.5 Urban Commons as Sources of Cultural Services

Cultural services are the final type of ecosystem services that urban gardens provide to local populations living in cities, the result of the experiences gained in connection with the other ecosystem services discussed earlier. For example, urban gardeners receive health benefits when they consume a healthier diet, such as the food sources locally produced in those urban commons (Kortright & Wakefield 2011). Families of children and adults nourish ecological memory and

build ecological resilience when obtaining gardening skills to grow and take care of their food sources. They also gain knowledge how to preserve and nurture the local habitat of these urban commons, which leads to a better quality of life (Blair 2009; Fulford & Thompson 2013; Levkoe 2006). Urban gardens can bring together marginalized groups in the usage of social networks and empower them as they become less economically dependent on an expensive food chain. Finally, urban commons can serve as recreational spaces for human activity and human satisfaction (Savard et al. 2000)

According to Tzoulas, et al. (2007) or de Vries, Verheij, Groenewegen, & Spreeuwenberg (2003), commoning in urban gardens greatly increases human health, as these gardens become inspirations for relaxation, stress relief, longevity, and better self-reported health. Urban commons serve as areas of recreational activity, such as jogging, cycling, walking, socializing and enjoying nature (Keniger et al. 2013). Connecting with nature is an essential benefit for city dwellers, and urban commons can transform cities into livable environments (Colding and Barthel 2013). In other words, these urban commons provide people with increased psychological, physiological, and cognitive health benefits (Keniger et al. 2013). There is a multitude of research showing that people value urban green spaces for non-material benefits when they use urban commons to connect with nature, and in some cases material benefits as well (Chiesura 2004). Human satisfaction can also be achieved through urban commons to the extent that they can serve as places for tourism as well (Savard et al. 2000).

Urban commons can be used as meeting places among immigrant communities, which facilitates cultural cohesion, adding on to the overall knowledge of urban residents (Saldivar-Tanaka & Krasny 2004). Through such meeting points communities are more collective, which leads to the potential growth of culturally traditional foods as well (Mangan 2015). Expanding the knowledge of the youth can also be done by providing urban agriculture to a more diverse audience, especially through school gardens, community gardens, backyard gardens, and commercial farms. Urban agricultural programs in urban commons can focus on fostering social networks as means of cultivating self-esteem among young people, as a measure to counteract gang activity (Fulford & Thompson 2013). In addition, urban commons can help urban dwellers deal with societal crises that exist in cities (Colding and Barthel 2013).

In conclusion, a systematic focus on the production of urban ecosystem services through urban commons can provide robust, adaptive, and resilient measures towards greater environmental sustainability and climate change mitigation in cities. The climate policy of cities needs to prioritize expanding the use of urban commons, especially as ecosystem services have a higher demand and a greater effect when they are in cities. The key task is being able to put an economic value on such ecosystem services. Today, ecosystem services are unaccounted for in our economy. Their value is thus undermined, with little incentive to expand the use of urban commons in the direction of preserving and expanding the availability of ecosystem services. It will be a challenge for the next generation of economists to place a value on ecosystem services in a way that incentivizes their use and protects the urban commons.

Section 2.6 Urban Commons and the Social Solidarity Economy

Our discussion in the preceding sections of this chapter makes it clear that the provision of a wide variety of ecosystem services with the help of urban commons carries great promise to mobilize local-community involvement in climate-change mitigation. There are so many possible applications that we must ask ourselves how best to harness those in cities across the world. How can we turn ecological commons in urban settings and their rich array of climate-action resources into a global force for good rather than just have them appear here and there as a fringe phenomenon?

One way to give urban commons a greater role is to make them part of a broader movement of social change aimed at both transforming how our economy works and mobilizing citizens to engage actively in that transformation. Beyond just providing technological solutions to the climate crisis and/or internalizing the externality of greenhouse gases by putting a high enough price on those pollutants, we will ultimately have to change the way capitalism works. That system is too driven by the biases of private property rights, market logic, and profit motive. Its key actors treat nature as capital to be deployed and exploited as source of income gains. No wonder we have polluted the world to a point of no-return and then refused to do much about it until it is (almost) too late. While we do not yet know whether capitalism can ever be reformed enough to make

sustainability its central organizing principle, we know that it will only change in this direction if pushed. That push is not only a matter of politics, but can be made more powerful if it opens possibilities for alternative organization of economic activity. This gets us to the "Social and Solidarity Economy" (SSE) we already mentioned earlier in section 1.4.

The SSE has been around to show that there is an economy beyond the private and the public that is based on community health through resource provisions and collective organizing, rather than profit and development. The SSE become an institutional and theoretical space where commons fit. The commons show growing potential to cover more institutional ground than ever before, but they are still marginal compared to the public and private sector when it comes to how cities and their vast urban resources are managed. And since they are still a new process, there needs to be some focus on how to push commons further than the marginal space they take between the public and private institutional set ups. Therefore, this section will show how SSE can help propel the commons into those to path that they need to take in order to be scaled up. This will also help cities implement more effective climate change mitigation and adaptation at the local level.

2.6.1 A Growing Focus on SSE and Community-Based Climate Action

Even though the SSE has yet to mature into a transformative force, it has already become the subject of much discussion and organizational effort as, for example, shown by the work of the Inter-Continental Network for the Promotion of the Social Solidarity Economy (RIPESS, or ripess.org). It is worth noting that the International Labor Organization (ILO) has vested itself as part of its "Cooperatives Unit" in the promotion of SSE which include "cooperatives, mutual benefit societies, association, foundations and social enterprises…. producing goods, services, and knowledge while pursuing both economic and social aims and fostering solidarity." (ILO 2009). Perhaps capturing the potential of the SSE as a transformative force best, the United Nations has put it front and center as "an alternative model of growth" for its "2030 Agenda for Sustainable Development" and its seventeen Sustainable Development Goals (SDGs), as laid out in UN Economic and Social Council (2021). We should note that SDG #11 refers to "Sustainable Cities and Communities" and SDG #13 to "Climate Action." For the purpose of the SSE's promotion, the UN has set up an Inter-Agency Task Force on Social and Solidarity Economy (UNSSE) which,

among many other initiatives, provides a useful "knowledge hub" platform of SSE's progress and application potential (https://unsse.org).

At the same time, we can notice an increased focus on community-based action in government policy, especially when it comes to climate. Take, for example, the Biden Administration's recent $2.3 trillion infrastructure investment proposal officially known as the American Jobs Plan as laid out in The White House's (2021) summary of its provisions. The plan includes, for instance, "dedicated funding for community-driven environmental justice efforts." It supports "large-scale sequestration efforts that leverage the best science and prioritize community engagement." The AJP would set aside tens of billions of dollars for a new Community Revitalization Fund, for "community-based small-business incubators and innovation hubs," and most notably also for a Civilian Climate Corps. The European Union's LIFE programme (https://eucalls.net/blog/life-budget), the union's main funding mechanism for environmental protection and climate action, sponsors programs aimed at ecosystem services, including the "circular economy," and promotes partnering with community-based organizations while prioritizing pursuit of the UN's SDGs. Canada's Climate Action and Awareness Fund (ECCC, 2021) invests a significant portion of its funds in community-based climate action projects. On the state level, the New York State's proposed Climate and Community Investment Act (CCIA; www.nyrenews.org/ccia) would set aside $5 billion for community-based organizations in frontline communities for local climate-change mitigation programs (e.g. community-owned solar). US cities are busy designing community-based climate policy action plans, as for example Charlottesville's C3 Community Climate Collaborative (https://theclimatecollaborative.org) or the Community Climate Action Plan (https://raleighnc.gov/services/sustainability/community-climate-action-plan) of Raleigh in North Carolina. The World Resources Institute (Galvin & Maassen 2020) provides an interesting overview of how five cities in very different locations (Nairobi, London, Argentina's Rosario, Mexico's Monterrey, and India's Ahmedabad) are taking very different kinds of climate change mitigation steps all of which involving communities trying to address issues of urban inequality in the process.

2.6.2 The Commons-Cooperatives Movement

While we can see encouraging signs of a growing awareness of the Social Solidarity Economy and initiatives on all levels of government in the direction of community-based climate action, it is not yet clear from those official policy institutions and programs how urban commons fit into this emerging picture. Prevailing definitions or analyses of the SSE do not typically include mention of commons, let alone urban commons. Nor do we see that linkage made in climate action plans of cities, states, or on the federal level. Given the deep historic roots of commons (see section 1.2) and their multiplicity of applications as collective-action exercises in resource management (see sections 1.5 and 2.4), commons should be an integral part of the Social and Solidarity Economy. This fact is getting gradually more recognized, as for instance Arampatzi (2020) and Salustri (2021) have done. There has also been a conference in Lisbon in November 2019 aimed at integrating commons into the SSE movement (https://ssecommons.cei.iscte-iul.pt/programme/). These recent efforts at linking commons to SSE may well be a necessary maturing process whereby the highlighting of the commoning dimension as social process gets recognized as greatly overlapping with what the activists of the SSE sector are aiming to do and thereby ebbing the way for bringing the two tracks of collective action together.

One other way to bring commons into the SSE movement is to recognize their complementarity with cooperatives, starting with the overlaps and similarities between Ostrom's design principles for commons and the International Co-operative Alliance's (ICA) updated Rochdale Principles of Co-operation for cooperatives which I first mentioned briefly in Chapter 1 (see section 1.4.2). While the complementarity between cooperatives and commons has already been noted by others in "theory" (De Peuter and Dyer-Witheford 2010; Schneider 2020), I have added my own contribution to this argument by providing concrete case studies confirming the potential for considerable synergies that strengthen each and make them together more than the sum of the parts (Guttmann 2018; Guttmann 2021). Here I want to point once again to important efforts at initiating community-based projects integrating commons and cooperatives.

2.6.3 Barcelona's Procomuns Forum

The Spanish city of Barcelona has set up initiatives on a citywide level that ensure both commons and cooperatives are adapting their own principles into one forged movement, setting up what they call a 'commons collaborative economy' where platform cooperatives are working in a commons-oriented approach to empower the citizens of Barcelona in key decision-making initiatives. Fuster Morell et al. (2017), reporting on their EU-sponsored DECODE project (for DEcentralized Citizens Owned Data Ecosystem), point to examples of collaborations between commons and cooperatives in the form of peer-to-peer production sponsored by the City Council of Barcelona set up on what has come to be known as the public policy co-creation forum Procomuns (https://procomuns.net/en/). Fuster Morell et al. (2017) define the commons collaborative economy as exemplified by the Procomuns forum on the basis of four criteria which together give you a good idea of what a commons-cooperatives movement consists of. Peer-to-peer relations, the first criterion, facilitate the involvement of communities made up of peers who generate collective governance schemes for platforms through participatory action that resemble those described in the commons literature. The second criterion pertains to the governance values that define the community of peers and their needs, not profitability. That governance scheme is based on value distribution among peers, a phenomenon that strongly resembles the idea of co-ownership and co-creation, notions that are identified both in cooperatives and in the commons movement. The third criterion is based on access to infrastructure and access to the provisions of commons resource, their reproducibility, and their capacity to include all members, equally and fairly dividing these provisions for collective benefit. The fourth criterion is sharing the responsibility of these platforms and their various externalities that may be generated in the process.

A qualitative assessment provided by Fuster Morell and Espelt (2018) shows which cooperatives have joined the commons-oriented collaborative economy in Barcelona by assessing their values and initiatives based on whether their governance is collective, whether they have an economic model, whether their use of technology is based on open source tools, whether their dissemination of information is open and democratic, and whether their actions have a positive and collective social impact on communities and their members. These qualities strongly resemble those

described in both the ICA principles and the institutional arrangements of Ostrom (1990). We mention here three examples discussed to provide a better idea of how this works:

El Recetario is a consumer and producer cooperative platform which focuses on research, experimentation, and the reuse of waste in order to produce accessories such as furniture. In other words, there is production of a resource based on the reusability of wasted resources and collectively-provided information on how to use these resources. El Recetario is a cooperative that provides collectively shared information on the reusability of underutilized resources. That information, specific to contexts that are brought out by its members, is managed as a commons.

Katuma is an agricultural-food consumption platform that takes many of its values from the commons, especially concerning collective governance. The platform uses open knowledge and open-source software to promote projects based on connecting agricultural producers to collective groups of consumers who are within proximity. The members, accessing the platform on the basis of paying a membership fee, make up both the producers and consumers of these agricultural products, which are produced, managed, and also consumed in a collective governance scheme. The use of open-source software, the transactions based on social justice, and the governance model between its members strongly replicate the qualities that define a commons-cooperative movement.

eReuse is a platform which focuses on refurbishing and reusing computers. It is created by Pangea, a non-profit organization in collaboration with fifteen community organizations all of whom are seeking to lower their ecological and electronic footprint by recycling and revitalizing used and discarded computers. The platform consists of open data and open-source tools developed by its members to reduce the costs of computer revitalization, including a tool providing information on the origins of reused material to detect how long the material will last and at what point in its lifespan the material cannot be recycled anymore. This information allows participants to produce computers that would have otherwise been wasted in the first place, a "circular economy" model worth emulating. The partners working together in eReuse may also develop common capital in their economic growth model if they produce a surplus of usable computers or in paid services such as equipment distribution, devices appraisal, and information reporting. The decision-making

process rooted in membership participation maintains the social responsibility of reducing waste arising from computer production. Because of its governance scheme, access of information, and the production of reusable resources in a collective and open manner, eReuse is a cooperative that distinctly adopts commons principles, therefore making it a key actor of the commons-cooperative movement.

These three illustrative examples discussed in Fuster Morell and Espelt (2018) are very distinct in emulating the values associated with a commons-cooperatives movement in the form of peer-to-peer relations. In addition, these three cases replicate the ICA principles in terms of how they organize their membership, how they collectively produce their product, and how they share information and govern their operations. They also replicate Ostrom's principles of commons in terms of the collective management of the resource based around communities who want to make a positive social and environmental impact on their surroundings. As a matter of fact, all three platforms are the result of a matching between these two sets of principles. One can therefore conclude that these three organizations can be labelled commons-oriented cooperatives helping Barcelona's goal to have a democratized economy oriented around commons principles.

2.6.4 Oakland's OmniCommons

Oakland's Omni Commons (see omnicommons.org) is a collective of collectives occupying a large building complex within a few miles from the Berkeley campus and from the Bay Bridge leading to San Francisco. The Omni Commons is a commons-cooperative alliance arrangement, because it comprises several cooperatives working together and occupying a shared space as a common-pool resource. The origins of Omni Commons stem from aggregating a variety of smaller commons spaces which sprung up in the wake of the Occupy Movement sweeping the Bay Area in late 2011 following that anti-capitalist movement's triple motto of community, co-creation, and inclusion. Several collectives converged into a larger nested-network configuration co-producing a commons with the aim of strengthening both the commons as well as its cooperating collectives. One positive result of this convergence was obtaining a much larger building space. The building, centrally located in Oakland off the highway linking San Francisco and Berkeley at the strategic mid-point between the two centers of the region, comprises a large ensemble of spaces and

facilities which can host sizeable community events. It contains a large ballroom stage, a dance studio, and smaller rooms available for rent. The building hosts regular events, workshops, even general assembly meetings, while also providing office spaces for the dozen or so collectives based there. In December 2016, the participating groups sharing the commons bought the space from the City of Oakland for $2 million and put the building in a community land trust.

Among the dozen or so collectives making up the Omni Commons membership there is a food-sharing cooperative, a radical public school, a feminist artist cooperative producing hand-dyed products and radical screen prints, a biohacker and citizen science lab encouraging people at all levels to co-produce for the community, an immigrant-support service provider, a film and video collective, an alternative tech lab dedicated to online tools for community outreach, and a wireless community network. One can consider all these collectives providing tools of commoning to all members of the various collectives. It is noteworthy that the opening page of the Omni Commons web site mentions the verb "commoning" as in "…collectives with a shared political vision of more equitable commoning of resources and meeting human needs over private interests or corporate profit."

All the collectives in the Omni Commons encourage collective action and governance schemes, built on a democratic decision-making process as befits a well-functioning commons-cooperative alliance. All members have shared and equal privileges and rights to govern. Responsibilities and needed tasks are determined collectively by all participants volunteering to commit to specific tasks based on their respective skills, life experiences, and capacities to get involved. The collectively based governing structure is designed to be as transparent as possible, because the communication and decision-making process is shared online with all members and participants. Each collective selects by vote a delegate representing that collective in different meetings. Delegates then meet to discuss and vote by consensus which rules of common space use are to be enforced, modified, or reversed. Such delegate meetings are facilitated by two people who keep track of time, take notes, and invoke conflict-resolution mechanisms whenever needed. Meetings use a shareable editing software called "Rise Up Notepad" for creation of meeting-related documents where any participants can write down or modify notes, contribute ideas, and share notepad contents with other participants, members, or volunteers. The notepad therefore is a place

where all of the proposed ideas for rules are shared among collectives and working groups over periods of time. Collectives also set up working groups which meet bi-monthly and organize a wide array of tasks ranging from garbage removal to finances or communication.

Omni Commons believes in allowing non-members to participate in these working groups as volunteers to expand participation among volunteers and so create a larger pool of labor for needed tasks maintaining the open space as a commons. Every member is expected to contribute at least a bit of labor to the upkeep of the building complex, such as cleaning, trash collection, tool maintenance, and scheduling of the use of space. Volunteers are welcome, but do not have the same explicit bundles of rights enjoyed by members. Only members of any of the thirteen collectives have full rights to use the space 24 hours, and they gain access by being provided a key. There is a fairly demanding application process for becoming a member, so that those participants having been vetted and accepted as members can be expected to bring clearly identified skills to the collective and/or jointly shared commons space, deserve the trust of others so fundamental to the viability of democratic governance of the shared resource(s), and know how to enjoy their bundle of rights in responsible fashion.

Rules are tightly monitored and strongly enforced which is one reason why the whole experiment has survived so well and even thrived over the years. For example, Omni Commons maintains a crucial Wiki page (see https://omnicommons.org/wiki/Welcome_to_the_Omni_Commons) which, among many other valuable information items, contains a list of all the rules members must follow. That list of rules, known as Safe Space Policy, serves as a space of deliberation used to host commoning initiatives in a way that is suitable to all of its members. But the list also determines why certain individuals may get sanctioned. The toughest sanction is a ban from using the space or from being part of a working group. The Wiki site also includes a shared list of all former members who have been banned and gives reason for such punishment in terms of broken rules. This "banned list" helps Omni Commons prevent or contain harmful conflicts which, if not checked, could prove very disruptive. When bans apply to expulsion from working groups, there is a Conflict Resolution Policy designed to help banned members reintegrate into working groups on the basis of agreed-to commitments addressing the initial conflict and pledges of changed behavior. All these bundle-of-rights allocation, rules-enforcement, and conflict-resolution

mechanisms of Omni Commons correspond to Ostrom's design principles for effective commons management.

While Omni Commons does depend a lot on the contributions of its members, it has its own methods of organizing finances that implicate all members. The initial funds are provided by founding member collectives through loans, grants, and donations. Those initial funds are then used for the upkeep of the commons, where monthly expenses of around $20,000 are spent on rent, utilities, taxes, insurance, and building improvements needed to comply with safety standards and building codes imposed by the local government of Oakland. While two thirds of that money come from contributions by member collectives, those contributions are evenly distributed among expenditures benefitting the commons as a whole. The contributions from collectives come from membership fees, where you have to provide a certain fee in order to become a member. This financing model corresponds to the ICA principles guiding common capital accumulation and distributed surplus among cooperatives. This idea of common capital transpired from the beginning of the space's existence, because signing of the lease was collectively decided and organized with participating collectives pooling enough funds together to gain access to the space. The remaining third of Omni Commons self-financing sources come from rental fees for use of its spaces. Omni Commons does fund-raising as well and organizes public events for that purpose. It has recently also intensified crowdfunding efforts.

2.6.5 Enercoop PACA

In 2005 a group of French SSE actors, including NGOs Greenpeace and Amis de la Terre ("Friends of the Earth"), farmer cooperative Biocoop, and ethical-finance company LaNef, set up Enercoop (see enercoop.fr) as an officially licensed cooperative (Société coopérative d'intérêt collectif, or Scic for short) offering its clients affordable access to renewable energy. Since then Enercoop has set up eleven regional coops to cover all of France. Within each of its respective regions, Enercoop serves as a local intermediary contracting energy users committed to renewable energy and at the same time engaging producers of wind, solar, hydro, and biomass power, connecting both sides through direct contracts balancing demand and supply.

Enercoop is obviously a cooperative entity at the center of France's burgeoning SSE sector. It has developed a stakeholder-oriented approach which has enabled the coop collective to recruit thousands of clients, including many of the country's key social-economy actors as well as other environmentally conscious enterprises or municipalities wishing to accelerate their transition to renewable energy and more efficient energy consumption. In this context, it is worth pointing to Enercoop's "network charter", in particular the cooperative, local, and citizen-client-activist dimensions of what the coop terms its "values and principles of action" (see Enercoop, 2017).

Perhaps the most interesting among the regional affiliates is Enercoop PACA in Southeastern France (Provence-Alpes-Cote d'Azur) which is traditionally a politically conservative region but also one where ample amounts of sunshine favor efficient use of solar power. Enercoop PACA, based in Marseilles, has mobilized a conglomerate of cooperatives, notably the producer coop PEP2A (Pôle Energ'éthique des PréAlpes d'Azur, see pep2a.fr), and associations representing villages and other consumer groups to co-produce Citizen-Based Photovoltaic Panels (CPVs) consisting of clusters of solar panels located where they work best. We can think of these CPVs as a sort of renewable-energy commons. They are citizen-based, inasmuch as the local businesses, land-owners, consumers (village inhabitants), and municipalities manage, finance, and ultimately take ownership of the solar panels launched by the project concerned.

Acts of commoning among project participants include citizen education about renewable energy and energy policy, collective evaluation of potential CPV sites, allocating project management tasks, and bring needed professional help into the project. Funds are raised by residents, local communities, and supporters to create production facilities for these CPVs. The collectively shared objective is a sufficiently large long-term return on investment to permit equitable distribution of common capital among those contributing funds to the project. Subsequently, the CPV installations belong to the members of the cooperative. Management is based on volunteer work by its members. The representatives are not remunerated for their volunteer work. Sales of the surplus of electricity produced pays for the operating costs, including the bank loans used to launch this project.

While only reaching sufficient scale for the launch of viable renewable-energy installations in the mid-2010s, the Enercoop cooperatives represent already an excellent case study for how to mobilize the needed zero-carbon transition on the basis of decentralized applications of various alternative renewable energy sources, notably solar panels. The cooperative nature of this experiment brings together stakeholders – energy providers, consumers, land-owners, municipalities, et cetera – whose cooperation also lends itself to efficiency gains in electricity usage, better cost controls, technologically improved monitoring capacity, experimentation with different energy mixes in response to local conditions, and price transparency.

For those of us interested in progress of the Social and Solidarity Economy, the Enercoop PACA/PEP2A launch of local CVP projects constitutes an example of a commons-cooperative alliance worth studying in detail to learn concretely how the mix of design principles guiding the CPV commons and the ICA principles underpinning the modus operandi of the cooperative(s) network work together. The same holds obviously true as well for the earlier two models of the commons-cooperatives movement, the Procomuns forum of Barcelone and the OmniCommons space in Oakland. The Enercoop PACA/PEP2A has the added attraction of pointing to the use of commons within the context of the SSE economy for a vital aspect of climate change mitigation, the central theme of this chapter.

These three examples show how the combination of a Cooperative-Commons Alliance help push the movement forward into more relevant institutional grounds. These examples illustrate that this combination can help commons move out of their currently marginal institutional position, while strengthening SSE as a third institutional arrangement driven by community organization. Framing this combination in light of climate policy may prove vital in making city adaptable units to climate change. The overlap between the two concepts is obvious, so their compatibility only strengthens both sides. This may also shed greater light on the greater array of partners (from SSE organizations and initiatives) commons can have for this strengthening process. This alliance will be detected when this thesis present specific commons as case studies with several cooperative or SSE based partnerships in chapter 4. And the examples of partnership this thesis presents only strengthens the argument that such an alliance works as an institutional set up.

Section 2.7 Concluding the Chapter

Chapter 2 serves as the theoretical foundation of urban commons in the specific context of climate change adaptation. This chapter reviews all the elements that make urban commons both tools of policy and economic implementation, especially as they drive communities to advance the ecological transition all on their own. We illustrate here how urban commons create ecosystem services at the heart of the city and also how they become part of the economy through the commons-cooperative alliance. By categorizing types of urban commons, one can easily pinpoint which urban commons are best fit for this ecological task. Having grounded the theory of urban commons in chapter 2, we are ready to study how they work in practice and explore the methodological framework of analyzing such real-life examples – the double focus of Chapter 3. More specifically, now that the theory of urban commons has been laid out, I can introduce some key tools that emerged in my research as the foundation for this thesis' methodology. Those tools will be covered in the next chapter, which will also represent the transition from the first part to the second part of this thesis. As a result, we begin with an introduction to the second part before delving into chapter 3.

Part 1 Conclusion

Part 1 of my thesis, comprising chapters 1 and 2, provides a theoretical and historical grounding of commons to establish their relevance for today's challenges besetting capitalism of which urbanization and climate change are among the most pressing to face. We shall make the case that urban commons can play a meaningful role in the climate change mitigation and adaptation efforts of cities in years to come. If so, it makes sense to shed more light on urban commons and analyze their mechanisms.

In Chapter 1 we go back to the pre-capitalist origins of commons as communally administered land whose gradual demise through centuries of enclosures marked the transition from agrarian-based feudal arrangements to industrial capitalism. What we can learn from this historic look back is that commons involve common pool resources, such as shared land, subject to communal management on the basis of collective governance and rules. From the perspective of chief

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protagonists of capitalist ideology justifying the pursuit of material self-interest among competing actors as guarantor of socially beneficial outcomes, the commons are an alien, if not altogether dysfunctional construct. But these critics of commons, from Mancur Olson's put-down of collective action to Garrett Hardin's "tragedy of the commons," fail to understand what commons are all about. Their exclusive concern with individual action and decision-making prevents them from appreciating the commons as collective-governance vehicles mobilizing social relations that define a community as a collective of shared interests.

Elinor Ostrom's field studies put commons back on the map, precisely because the "design principles" she identified from her many observations as constituent elements of commons captured their social and collectively elaborated nature. In her later work, especially in her collaboration with Charlotte Hess, Ostrom laid the foundations for rendering commons more applicable in a broader range of situations beyond natural resources. The two considered, for instance, knowledge commons of which the popular site Wikipedia is a good example. To the extent that their broader applicability makes commons a force to reckon with, we can do well to go back to Karl Polanyi's "Double Movement."

This notion encapsulates the dialectic tension between capitalism's relentless commodification logic and people's resistance within which commons can become part of a broader social movement aiming to transform capitalism, the social solidarity economy. Here urban commons can be fruitfully placed as an application with great potential and strategic importance to help cities become better places to live in. Specifically, urban commons can play a meaningful role in efforts by cities, connecting neighborhood associations and local administrations, to make their urban spaces more sustainably livable and better protected against the many impacts of climate destabilization.

Part 2 – Tactical Charters and Open Platforms as Tools for the Fabrication of Urban Commons

The second part of the thesis is divided into three chapters which present different aspects of my contribution to the growing academic literature on commons. The first chapter of this part (which is Chapter 3), focuses on some key notions and concepts that serve as a basis for gathering information and providing analyses for my research on urban commons. Chapter 4 presents three case studies of specific examples of urban commons, each with its own objectives and specificities, contributing to climate change resiliency. These case studies are meant to test and illustrate the methodological framework developed in the preceding chapter. To close this part, a transversal discussion of each case study, and what they mean for the future of commons is proposed in the chapter 5. By comparing the case studies in this chapter and drawing out implications for future policy, I try to clarify the theoretical foundation of my contribution to the analysis of urban commons.

The first analytical tool that I use for my research highlighted in Chapter 3, is the notion of online open-source platforms as a type of commons that helps ground urban commons in the institutional fabric of cities. The presentation of open platforms as commons is one of the central concepts of my thesis. Those very platforms are used in my research to analyze urban commons, their governance structures, links with other commons, and their potential as climate change resiliency tools made for communities and by communities. I discuss here specifically two online open-source platforms that focus on urban commons. One is the Co-cities Project founded by Iaione and Foster (2016), two scholars recurrently cited in this thesis. The other platform is called "REMIX The Commons" which I am a member of and which allowed me to conduct much of my research documenting specific urban commons and linking them to each other. These platforms serve as a key source of information on commons' governance structures and their links with others in support of a more coherent commons social movement. The platforms are also spaces where commoners can learn from each other's experience and use lessons learned from other urban commons. I label such platforms as peer produced open source urban commons (PPOSUCs), and they are a central component to how I conducted research.

In addition to these PPOSUCs, another key analytical tool that has emerged from my work at *REMIX* is the notion of "tactical charters." *REMIX* collects several such charters from different urban commons and presents them as representations of how the governance was decided and built. But they are also jurisdictional documents for commoners to engage with municipalities as anchors of validation, support, and protection by authoritative bodies. It is in this light that such charters can be considered tactical, as they have a strategic purpose in making urban commons achieve permanency in their neighborhood contexts. The chartering practices analyzed in chapter 3 in connection with the writing of charters may well help reinforce commons as climate change resiliency tools in the policy and institutional framework of cities. As such, my thesis presents as one of its contributions chartering practices as a crucial dimension of "urban commoning" activity designed to help cities become more resilient and better prepared for climate change.

These methodological contributions of PPOSUCs and "chartering practices" are tested in my case studies of chapter 4, each of which presenting a specific example of an urban commons aimed at the ecological strengthening of neighborhoods. The case studies are well anchored in the "*REMIX The Commons*" PPOSUC, and they each have their own tactical charter fortifying their case as climate change resiliency tools. Hence, they fit perfectly with the theoretical framework of my thesis, and they are testing grounds for how my contributions advance the notion of urban commons in academia.

A discussion on how these contributions work with each of the case studies is presented in chapter 5, concluding my thesis. When looking at these case studies together and comparing them to each other, we can easily see how tactical charters are important notions to consider in urban commons literature and how PPOSUCs fuel the research of urban commons in specific sectors. This concluding chapter highlights how my two principal contributions can be used for analyzing urban commons in the future. In sum, my thesis is evenly divided into first discussing the theory of urban commons (presented in part 1) and then evaluating urban commons as a tool for climate change resiliency and ecological transition in part 2 where I also present two key contributions – peer produced open source urban commons (PPOSUCs) and chartering practices as urban commoning activity - as the key nucleus of my research.

Chapter 3 – PPOSUCs and Chartering Practices as Methodological Devices for Commons

The continued revival of the commons in the 21st century depends on conceptualizing much more broadly our understanding of how this form of social mobilization becomes the most appropriate regime of collective action, especially in the context of cities facing climate change and adapting to its many challenges. We are starting with the proposition that in today's world the applicability of commons has moved beyond natural resources also to public spaces, possibly even involving neighborhood block associations trying to improve living conditions in their *quartier*.

The organizational principles of commons may also apply to innovation and dissemination of new knowledge based on open access, subject to widely accepted regulation of access and usage. Most broadly defined, commons may help foster and regulate any socially beneficial and collectively elaborated source of societal capacity to be shared, such as launching an effective vaccination campaign. In other words, we need to conceptualize the applicability of commons more flexibly and widely in line with underlying societal changes. A second determinant of the revival of the commons depends on how well we master their creation and sustenance over time. Depending on collective action and shared governance, commons are always also a social process involving different stakeholders and typically an even broader network of beneficiaries vested in their success. That is why we have also put emphasis on the commoning dimension which captures this social process side of commons.

Both of these determinants – how to define the resource involved and how best to help along the social process of "commoning" – stand to benefit greatly from a certain kind of expert, a scholar-activist dedicated to the formation of commons, perhaps an academic – be they economist, sociologist, social psychologist, cultural anthropologist, political scientist, law expert, or public policy strategist – bringing an inter-disciplinary orientation to the project. Section 3.1 introduces the notion of scholar activism as a type of qualitative research as the first part of the descriptive phases of my methodology. Here we start with Elinor Ostrom (1990) herself, before mentioning other theoreticians of commons bringing a practical-organizational side to bear to their work on commons and eventually ending the list with Foster and Iaione (2016) whom I introduce as key

scholar-activists focusing on urban commons. Their contribution as scholar-activists can be manifold. They can help analyze the situation on the ground that might justify launching a commons, reach out to potential participants for involvement, guide communication towards a proposal ready for launch, mobilize support from the local authorities and other potential beneficiaries, set down the ground rules, conclude contractual arrangements with other interested parties, record the life-cycle experience of the commons, and find ways to keep it going effectively.

Since this chapter is ultimately about methodology, it must be tailored to the commons as resource management and social process. Previous scholars were able to test the commons in their field research and thus develop step by a step a methodological framework for their launch and their eventual success. Ostrom's eight design principles are in that sense "methodology" inasmuch as they offer useful devices and institutional guideposts (e.g. rules of governance) when setting up commons and keeping them going. Reaffirming the notion that scholars analyzing urban commons can be considered scholar-activists aiming to help set them up or sustain them over time, I have conducted my research in the same vein. The tools emerging from my research – peer-produced open-source urban commons (PPOSUCs) and "chartering practices" as a key commoning activity giving an emerging urban commons a means for self-identification - are introduced and thoroughly described in section 3.2.

This kind of action research can be traced back to Ostrom's methods to analyze the commons. Her research had instigated a whole new concept on how to test the commons, and her work represents the start of bringing a methodological framework to the analysis of commons. Other scholars followed her methodological approaches to analyze new forms of commons existing in other sectors and not just common natural resource pools. Charlotte Hess (2008), for example, used Ostrom's methodology to test it on 'new commons' such as informational commons like Wikipedia. Christian Iaione (2016) took many of the elements of Ostrom (1990) to examine urban commons and identify tactics of commoning. My own research is strongly influenced by Iaione's methodological work. While this research presents a different set of tools to examine commoning tactics in urban commons, the methods involved to use those tools can be traced back to Iaione (2016) and even Ostrom (1990) in her design principles for commons.

Since my thesis is on urban commons governance schemes, this section focuses especially on Sheila Foster and Christian Iaione, two prominent scholars of urban commons research, who paved the way for methodological tools used to examine urban commons. Their research offers guidance for the experimentation of governance schemes in urban commons, a feature further developed in this thesis. We will focus in particular on Foster and Iaione (2016)'s Co-Cities Project, where experimental forms of commons creation and nourishment are recorded in an open platform. Their observations have allowed Foster and Iaione (2016) to come up with modifications of Ostrom's design principles specifically adapted to urban commons.

The Co-Cities Project in its open platform is a model how to gather information on urban commons. My own research similarly uses an open platform known as *Remix the Commons* (https://www.remixthecommons.org/en/) which has the same wiki interface and follows the same objectives and features found in the Co-Cities Project. Here (in subsection 3.2.2) I will explain what the Remix platform is, how it works, and the similarities it shares with Co-Cities Project. I will then show how I used Remix to organize my research and trace the sources of that information. Online platforms, such as the Co-Cities Project or Remix the Commons, are a useful type of knowledge commons and communication network capable of generating positive network externalities which strengthen the urban commons movement. These so-called "Peer Produced Open Source Urban Commons" (PPOSUCs) are a 21st century application of the "Think Globally, Act Locally" principle underpinning political counter-movements such as the urban commons movement.

In my research on the methodological devices of urban commons I came across the notion of "tactical charters" which I found playing a significant enough role in the operation of some of those commons to warrant further exploration. Looking at ultimately eleven different urban commons as case studies documented in the *Remix* platform, each of which with its own distinct charter, I use discourse analysis in section 3.3 to analyze these commons-defining documents in greater detail. This research has enabled me to identify shared focal points and overlapping structures among those tactical charters to see what they have in common while at the same time illustrating their diversity in form and content.

Tactical charters, we will argue, are potentially really important mechanisms with which to anchor the commons on the basis of an agreed set of organizing principles defining it – the resource(s) it protects, the parties involved, its functioning principles, its governance structure, and perhaps also its long-term objectives on the basis of which its success gets assessed. By following methodological tools used in the Co-Cities Project, further coherent patterns were observed in the urban commons charters documented in Remix. These confirmed several new principles of urban commons governance schemes through the lens of chartering practices (see subsection 3.3.2). These involve getting the community involved, structuring commons as physical and social spaces, spurring collective action among stakeholders and democracy, and achieving permanency. Here I detail all the elements of each identified principle, where they were consistently observed, and how they are used as the main methodological tools of this research. Section 3.3 thus becomes the crux of how my methodological tools are applied and analyzed.

Proceeding from the descriptions of my methodological tools in section 3.3, the chapter concludes in section 3.4 with a discussion of how tactical charters, as well as other methodological devices discussed here as helpful in the launch and day-to-day management of commons, can play a useful role in the kinds of urban commons we are interested in analyzing. We are looking in particular for commons capable of generating newly created urban resources that may prove helpful in the transition to a low-carbon economy as well as to a different, more sustainably minded capitalism. I have characterized these as "transitional urban resources" (TURs) which may spur on short circuits, promote the circular economy, and become a crucial vector in the spread of the social and solidarity economy. Many of those may well only emerge when other SSE actors connect with commons or create them as part of their growth process, as we have discussed already earlier in connection with cooperatives (in section 2.6.2). In this case chartering practices may play a crucial role in formalizing this institutional linkage. Moreover, urban commons may thrive, moving in all kinds of unexpected directions, as they prove to be an effective organizational response to many climate-change mitigation and adaption efforts. Here too chartering may help identify the specific resource commoners are concerned with.

Section 3.1 Participatory Action Research in the Study of Commons

This section serves as the introduction to the methodological explanations highlighted in chapter 3, tracing the typical methodological tools used in the commons literature. Much of the foundation of commons research has been carried out by scholar-activists who as academics see their work directly affect social change and serve marginalized communities. This tradition of scholar-activism pervading commons research started already with Elinor Ostrom (1990) and her identification of eight "design principles" for successful commons rooted in a series of detailed field studies. We can in this context also think of other key academics having played a key role in the promotion of commons, including Charlotte Hess (2008) on knowledge commons as well as Sheila Foster and Christian Iaione (2016) whose Co-Cities Project has played such a formative role in the promotion of urban commons.

Scholar-activists have a distinctly different methodological research approach to those typically deployed by traditional academics. The latter tend to use quantitative research methods to gather numerical data or manipulate pre-existing statistical data for supposedly objective measurement of verifiable cause-effect relations. The scholar-activist, by contrast, wishes to impact the problem they study and change policy or public opinion. Wanting to understand individuals' understanding of their social reality in order to change how those think and act, scholar-activists focus on qualitative research methods collecting non-numerical data such as questionnaires, interviews, focus groups, participant-observation, recordings, documents, and artifacts. Their engagement with the objects of their study may even go so far as to motivate scholar-activists towards participatory action research (PAR) whose methodologies enable them to work in partnership with marginalized communities that leads to action for change, such as realization of commons projects.

I see the research work I conducted for my thesis precisely in this context of participatory action research using qualitative research methods. I was able access and then become a regular participant on a PPOSUC called the *Remix The Commons* platform. While analyzing various urban commons projects there, I became interested in the creation of documents, known as charters, which commoners in several urban commons were using to advance their cause. That interest crystallized further while working on my doctoral thesis for which I selected eleven charters among

the two dozen or so I had identified earlier for closer examination. I am presenting my findings of this research here in chapter 3. Both the creation and subsequent use of charters are integral part of commoning activity and as such best characterized as "chartering practices." Subjecting the ten tactical charters to discourse analysis has given me valuable insights into their specific contents, what they share in common and also what sets them apart as unique projects.

This work prepared me well for interviewing leaders of three of these urban commons, all very different from each other while sharing a concern for making their respective neighborhoods more resilient in the face of climate change. Those interviews, conducted for a radio program on urban commons associated with the *Remix* platform, gave me the information I needed for extensive analysis of these three commons as case studies (presented in chapter 4), which also included site visits, identification of key partnerships, and evaluation of local government policies towards these projects. Part of my participatory action research was for improving *Remix* as a PPOSUC, and the other part for shedding light on "chartering practices" as part of commoning activity.

3.1.1 Scholar-Activists and their Toolbox

When approaching the commons as an academic subject of study, it becomes immediately clear that one needs to bring a thoroughly inter-disciplinary lens to bear in order to do its complexities justice. Commons are surely an economic phenomenon, but also of interest to political science, public policy, law, sociology, and social psychology, while steeped in history and surely also a matter of geography. The great researchers of commons confirm this. They were, as we shall examine in more detail shortly, all quite inter-disciplinary in their approach to research. But they were also politically active beyond being just pure academics, and their work on the commons was part of that activism. The revival of the commons and the scholar-activist go hand in hand.

There is a long tradition of scholar-activism in many domains, as exemplified by the great American sociologist and civil rights activist W. E. B. Du Bois or noted by Frances Cherry (2008) for social psychology. Of more direct relevance to my work is a recent contribution by Margit Mayer (2020), discussing the possibly meaningful contribution of radical urban scholar-activists

at this moment of crisis when a global pandemic has put into question the organization of urban space under the neo-liberal regime prevailing over the last three or four decades.

A majority of academics will still argue even today that activism and scholarship do not go hand in hand, since scholarship needs to be objective which seems to imply keeping some distance to the object of research. This criticism, which risks condemning university professors to life in an "ivory tower" removed from the rest of society, confuses activist scholarship with advocacy. When you are an advocate, you start with support for a cause whether or not grounded in theory. But a scholar-activist conducts first of all rigorous academic research that aims at societal transformation, in other words scholarly work linked to a political project or social movement.

A scholar-activist's positioning towards the object of research targeted differs from that of a detached, supposedly "objective" academic. Having a vested interest in being integral part of the object of study, either as actively observing participant or to have one's research be part of a process of change, the activist's side of the scholar-activist will want to commit to an engaged research program which some (Baum et al. 2006; MacIntyre 2008; Pain et al. 2017) have referred to as "participatory action research" (PAR), as formulated initially by Kurt Lewin (1946) (see also Adelman 1993).

Ideally, such PAR would itself inject much needed community knowledge to be shared so that the members of the community can work better together. Local communities can get increased control over their spaces and resources by working together and along widely agreed rules shaped by building consensus. Incentives can help "nudge" parties involved in the right direction of consensus and cooperation, as can greater understanding of what is involved in running and sharing the commons involved. Building that knowledge and applying it communally for a shared purpose takes a lot of different inputs, and open-access and direct-participation research on how the commons works makes it work better.

3.1.2 Qualitative Research Methods Used: Discourse Analysis and Interviews

Traditional quantitative methods processing the data collected can be useful in support of participatory action research. But PAR projects will more likely be inclined to use qualitative methods of research. As pointed out by Gill et al. (2008) as well as Taylor et al. (2016), qualitative research methods (QRMs) focus on getting a deeper sense of inter- and intra-group interactions to understand better the social process underpinning the functioning of an institution, like the commons. Researchers will want to get a feel for the "mood" of the group and other aspects driving group behavior, and QRMs are designed to capture that. They involve interviews (group or individual), focus groups, surveys, observation, participant observation, textual or visual analysis (from books or pictures), or discourse analysis applied to documents and written or oral communication.

Especially tailored to trace emerging social phenomena in motion, such as the setting up of a commons for example, QRMs allow a greater flexibility of design by using several such methods together for a deeper level of data collection. There is also more flexibility than standard quantitative research, because the qualitative researcher can change the QRM strategy or study design while still in the middle of carrying out the research project, if interim data analysis suggests such mid-course correction. Often enough, QRM-based studies serve a preparatory purpose to figure out what quantitative data to collect and how to do so best for a more traditional study of the topic concerned.

My own engagement as scholar-activist committed to the study of urban commons has greatly benefited from the flexibility qualitative research methods bring to the data-collection and -analysis process. For the last five years I have been active on the *Remix the Commons* site (https://www.remixthecommons.org), which exists in three languages (English, French, Spanish) to provide a global information and communication platform for news and developments concerning a worldwide collection of urban commons. Soon enough I began checking out urban commons of all kinds to see whether they had come up with commons-defining documents, called "charters," with which members of a commons wanted to put in writing, as a collectively

elaborated process and hence an act of "commoning," what their project was all about and committed to do for its long-term survival.

As I was analyzing various charters, each embedded in a highly specific context of the commons project it served across a great variety of urban commons, I soon went from content analysis of the individual texts to a deeper level of curiosity about the charters' strategic significance in terms of what they share as generalization while each of them remains completely unique and specific. I wanted to understand the different facets of their social context to better appreciate their role in the formation and perpetuation of urban commons. This ambition required the use of discourse analysis as a qualitative-research method (Luo 2020; Zajda 2020) which led me to the idea of constructing an "Atlas of the Charters of the Urban Commons" classifiying charters (https://wiki.remixthecommons.org/index.php/Atlas_des_chartes_des_communs_urbains). Of the twenty-three charters in the "Atlas," I have chosen ten for further discussion later in this chapter.

But there were also three charters whose urban commons I wanted to analyze more closely as uniquely illustrative of the variety and potential of urban commons in our times. For those I organized hour-long radio interviews, another pertinent qualitative-research method I had a chance to make good use of, with key commoners playing leading roles in their respective urban commons, presented as three separate case studies in chapter 4 – the watershed commons Bassin Versant Solidaire de Forest (https://www.raptz.com/action/bassin-versant-solidaire-de-forest) based in southern Brussels (Belgium), the resiliency farm Agrocité on the western outskirts of Paris which is part of a broader social-solidarity-economy project called rUrban (https://www.raptz.com/podcast/agrocite), and the heritage site Murs à Pêches having been turned into a neighborhood cultural site on the eastern outskirts of Paris (https://www.raptz.com/podcast/festival-des-murs-a-peches-de-montreuil).

My own research has to be placed in a long-standing tradition of scholar activism fueling scholarly work on commons theory and practice. To be specific, my involvement with REMIX as a scholar activist shows how I participate in the development of commons directly while analyzing and studying them at the same time. I thus use the notion of participatory action research to describe how I analyzed commons for this thesis. In this context, we have to appreciate that the emergence

of the internet, with its social-media platforms, "Big Data" collection, and video-conferencing capacity, is dramatically transforming application and use of quantitative research methods, thereby also more broadly altering the conduct of participatory action research. It has become much easier to organize, observe, and measure ongoing inter-group interaction online, and there are many more ways to set up such communication among actors of a community. But we have to recognize at the same time that the great scholar-activists driving the revival of the commons over the last quarter of a century have pretty much all used open-source or peer-to-peer platforms to drive their participatory action research engagements, from Elinor Ostrom's inter-disciplinary Workshop in Political Theory and Policy Analysis at Indiana University to the Co-Cities Project of urban commons researchers Sheila Foster and Christian Iaione (2016) to Michel Bauwens' P2P Foundation.

3.1.3 Elinor Ostrom: The Original Scholar-Activist of the Commons

Let us not forget that Elinor Ostrom herself was a powerful example of such a scholar-activist, doing ground-breaking research that after all won her the Nobel Prize in Economics in 2009 "for her analysis of economic governance." Starting already as a graduate student in Political Science participating in her future husband Vincent Ostrom's investigation of water resource management in California as a field study, she noticed from on-site observation that people with conflicting interests and from different jurisdictions, but all dependent on the groundwater basin she was observing, were able to figure out compromises and incentives for each other that would collectively prevent them from over-exploiting the shared resource. This finding, in direct contrast to the "tragedy of the commons" argument by biologist Garrett Hardin (1968) according to whom self-interested individuals were bound to destroy shared resources by over-use, became the central focus of her doctoral thesis and then of her research center which she set up and ran like a workshop of collaboration among scholars from different disciplines.

Ostrom was the first scholar to validate the importance of commons, not only as an academically valid concept worth studying but also as a force for good bringing humans into a better relationship with their environment. Her research debunked Hardin's (1968) claim that commons-based governance would lead to human failure, an argument at the heart of the neo-liberal consensus in

favor of private property rights and individual self-interest following the profit motive. Her argument showed how commons-based governance exists to counterbalance poor conditions created by predatory capitalist behavior. She then sought concrete answers by doing her own analytical research on commons that existed already. That research became the first successful attempt in orchestrating a design language for management of the commons.

Ostrom's work consisted of field studies all over the world observing communities of common resource pools and identifying actions taken by those communities to manage their commons. She would delve into the field work to analyze the contextual and institutional details that define the ability of communities to undergo resource management on a sustainable basis. This process was based on analyzing what Ostrom describes as "temporal turn-taking." She defines this concept as rotations that produce built-in monitoring schemes among commoners who share the resource, a concept that has led her to define the design principles of monitoring and sanctioning. This approach depends on norms that are reputational amongst commoners and equally shared, with a reliable expectation that the commoners will commit to repeat play. Such commitment usually happens under a social context where all commoners within a resource share the same objective. Workable governance schemes also depend on the degree to which one can delimit the physical space. Ostrom therefore analyzes how imperative it is for commoners to set or draw boundaries in a manner that achieves a workable degree of internalization, another conclusion that is defined in her principles. Achieving effective governance schemes of CPRs also depends on commoners understanding patterns, terrain variations, and interactions among habitats and relationships. Commons, Ostrom stressed repeatedly, have to be put in an ecological context.

In addition, Ostrom focuses on human cognition and manners of analyzing it, which is also part of her methodological framework. Focusing on human cognition allowed Ostrom to understand behaviors of commoners when they implement a shared governance scheme. She states that even analyzing details of apparent insignificance helps improve the steps taken to implement the governance scheme. So, in studying the effectiveness of common resource pools, Ostrom took note of the steps commoners committed to engage in face-to-face communication and experimentation as ways to mitigate issues of overharvesting. These were all essential in developing her methodological framework for CPRs.

Ostrom stressed using precise vocabulary for these behavioral patterns of shared governance. In this regard, she made three key distinctions that helped her analyze commons - the distinction between open access regimes and common property, the distinction between CPR itself and the property regime that governs it, and the difference between resource systems and units. These distinctions allowed her to understand the bundles of rights that commoners had in the management of CPRs. Identifying these bundles of rights was key to determining the factors and exploring the nuances within which resource users manage CPRs and shared property regimes.

Arun Agrawal (2003) provides a very elaborate explanation on how Ostrom applied her methods to analyze common resource pools. He states that Ostrom's production of research does not contain consistently collected data for each case study, and her research samples may contain different data from case to case. But what makes Ostrom's research reliable is how she examined each case using the same set of independent and dependent variables, all of which are defined in her design principles. These design principles are researched and confirmed in fourteen different case studies. For Ostrom, a design principle is an "essential element or condition that helps to account for the success of these institutions in sustaining the CPRs and gaining the compliance of generation after generation of appropriators to the rules in use" (1990, p. 90). The key characteristics of her methodological tools involves small group size, well-defined boundaries for resource and user groups, ease of monitoring and enforcement. The principles are therefore easily recognizable, especially since they are based on generalizations about communities and their relationship with common-pool resources which they target for collective-action management. This relationship may in such fashion grow an institutional framework that allows commons to be identified, categorized, and analyzed.

Among the many collaborators Ostrom got deeply involved with through her inter-disciplinary Workshop in Political Theory and Policy Analysis at Indiana University was Charlotte Hess with whom she co-published several works on treating information as a common-pool resource best subjected to a set of access and usage rules assuring its stable CPR management so that knowledge can finally be organized as commons (see, for instance, Hess and Ostrom 2003, 2007). Hess, who characterizes herself as a professional artist, researcher, writer, and speaker on the study of the commons and collective action, was a librarian by training and, among several academic

commitments, worked on the digital library which anchored her interest in knowledge commons, the central focus of her research work over the years.

Hess has been instrumental in pushing for a widening of the applicability of commons into new areas, as evident by her work on microbial research commons and also promoted by her engagement as information officer in the International Association for the Study of the Commons. Hess (2008) summarizes well the wide range of what she termed "new commons" emerging in such areas as infrastructure commons (including internet, wireless, electromagnetic spectrum), neighborhood commons (including community gardens), medical and health commons, cultural commons (including eco-tourism, public art, indigenous culture), knowledge commons (including peer production/mass communication, science, public domain, libraries, intellectual property rights, education and the digital divide), market-related exchange commons, and global commons of which climate change is one of many. Interestingly, Hess (2008) also characterized the "new commons" as a "movement" of activists developing new forms of self-governance and collective action.

3.1.4 Scholar-Activists of the Urban Commons: Sheila Foster and Christian Iaione

One important extension of the new commons movement my research is focusing on are the urban commons. In this domain two great scholar-activists have made an important contribution, Sheila Foster and Christian Iaione. Foster, an African-American, is the Scott K. Ginsburg Professor of Urban Law and Policy at Georgetown University in Washington, D.C. while Christian Iaione directs an inter-disciplinary graduate program on Law, Digital Innovation and Sustainability at the LUISS Guido Carli University in Rome. Foster's personal web site www.sheilarfoster.com details her activism in environmental and climate justice as well as on the role of cities in global governance. She directs an international network of research teams, known as LabGov, which conceptualize cities as "commons" to help city dwellers reclaim more power in shaping the urban space around them and the policies guiding cities. Christian Iaione describes himself on his Twitter account as "creative jurist, author on # urbancommons & #internetofhumans." Among the many roles Iaione plays in his advocacy work for democratizing the future of cities, he has turned the

web site for one his books, www.thenatureofcities.com, into an activist's contact and networking platform.

Iaione (2014) has developed a research framework for urban commons. He uses a theory for urban local governance based on transforming commoners into distributed nodes of collective action, where an examination of design principles and methodology highlights the difference between Ostrom's CPRs and urban commons in general. He develops for that purpose a 'commons-based governance matrix' to explain these methodological processes. Its five principles are adapted to urban commons, and they differ from Ostrom's design principles for stable CPR arrangements. His research agenda involves organizational innovation inside administrative structures, a communication plan with a democratic digital platform as a central tool, and bridging institutions that spread commoning culture and practice (Iaione 2014).

Iaione uses three applications to detect principles of cooperative and polycentric governance. The first one is 'commoning', which he describes as the enabling of collaborative commoning behaviors, habits, and civic duties. These commoning behaviors are based on 'nudges', which he describes as administrative measures that serve as incentives (Thaler and Sunstein 2008). Nudges are defined by the 'facilitation of wide-spread collaborative action for commons preservation and implementation' (Iaione 2014). This could be in the form of waste recycling, 'circular economy' mechanisms, energy efficiency, distributed energy systems, locally grown food programs, food waste reduction, and water saving methods. Nudges are grounded in a general recognition by actors of common objectives that create appropriate systems of incentives for commoners.

The second application is called Wiki-commoning, which Iaione (2014) defined as public communication and creation between local networks in openly accessible platforms or websites. This application involves the sharing of information through advertising campaigns, promotional activities about events or fairs, and reward tools primarily directed at new generations of educators, public officials, and citizens (Iaione 2014). Those channels of communication create new methods of linking people to commons, map commons and the communities that govern them, and introduce platforms for sharing initiatives and goals that involve use and implementation of urban commons. They also aim for commoners to monitor or influence the state to protect urban

commons, and Wiki-commoning outlets may also get the authorities to communicate with urban commoners. Iaione (2014) states that such digital tools of commoning provide commoners with resources, especially intangible assets that enrich commons governance, and help people who want to contribute to their communities get the tools they need to do so. Iaione specifically states that '…[T]here is a need for a commoners-enabling digital platform that allows the administration to coordinate and concretely support the efforts of all the actors or nodes of a polycentric urban governance scheme.'

The third application involves strong collaboration between public, private, and civic actors, all of whom follow a strategic innovation of urban development. Such collaborative urban planning is the best space to test various cooperation-based methods of urban commons governance.

All three applications were used in Foster and Iaione's (2016) Co-Cities Project in which they have surveyed samples of urban commons in a hundred cities around the world. To record and store this information, they developed a website (https://labgov.georgetown.edu/co-cities_project/) to which additional case studies could be added by other interested scholars. The data came in the form of mapping and open collaborative data sets bridging the gap between cities and commons' institutions, all with an aim of enlarging the network of urban commons. This research tries to determine how a city as a commons might help address issues of urban poverty, gentrification, and climate change.

If we conceived of cities as commons, as Foster and Iaione suggest, then we can apply Ostrom's design principles to them striving for a more fair, inclusive, sustainable and resilient future, given existing patterns of urbanization. To help with that challenge we need to understand that hotly contested urban resources, such as public spaces, open or vacant land, abandoned or underutilized structures, and an aging infrastructure, may be better managed through commons facilitating bottom-up self-governance by and for hard-pressed communities focusing on helping themselves through collective action. Foster and Iaione (2016) are aware that urban commons are experimental by nature. Researching them requires careful application of flexible research methods that are similar to what Ostrom used in her analysis of common resource pools. These two authors also

stress that new approaches and methodologies are constantly being applied to commons research, and such methodologies require prototyping, monitoring, and evaluation.

The Co-Cities Project, which dates back to 2017, aims to be a vector for new methodological approaches to different types of urban commons, all with a common framework based on community-based initiatives involving local communities as the principal institutional actors of the governance schemes. In order to analyze this, Foster and Iaione focus on identifying common patterns, processes, practices, and public policies that may apply to different urban commons. This focus has allowed them to identify various innovations by commoners to transform urban development and land use, as well as economic patterns and new urban welfare systems that stem from specific democratic processes connected to urban commons management. Their Co-Cities site also identifies networks of urban commons able to create these urban innovations.

Foster and Iaione (2016) have introduced five pillars for analyzing urban commons as major spaces of innovation. Those five pillars comprise the core of their methodology to implement an urban commons transition plan. They are:

1. introduction of urban commoning through a regulation or a new group or organization;
2. collaborative governance of sharing, possibly in conjunction with a collaborative economy actor or project based on a complementary currency system, community interest companies, local development agencies, or other SSE institutions;
3. social innovation as the basis of a shift from a traditional urban welfare system to a collaborative welfare system;
4. radical transformation of the internal organization and work methodologies of urban bureaucracies into citizen-enabling communities of service designers; and
5. the establishment of a collaboration lab or Co-Lab, a place and institution, such as a living lab, where collaboration takes place, is taught, and communicated.

These five pillars make up the framework of Foster and Iaione's (2016) methodology for the Co-Cities Project for whom experimentation is key in analyzing urban commons. Experimentation is central to institutional design, an element that is also highlighted in Ostrom's research. What Co-

Cities shows is that experiments foster designs for governance tools which can be adapted to different local contexts. Foster and Iaione (2016) emphasize the flexibility of each experiment and state that urban commons cannot be limited to rigid models, an aspect that is also stressed by Gwen Arnold (2014). As a matter of fact, Arnold (2014) highlights the importance of facilitating linkages between several actors who are involved in the making of a governance mechanism. This is based on the adaptiveness in dealing with complex systems of relations, sharing, collaboration, and polycentricity which the Co-Cities Project aims to test in a concrete setting.

My research, following the same approach of determining forms of experimentation that have created shared governance schemes, leans heavily on the methodological approaches used in the Co-Cities Project. This is why I stated earlier that my own research has been strongly influenced by the work of Foster and Iaione (2016). The *Remix The Commons* platform I have used to gather data on urban commons follows similar methodological principles and configurations as those characterizing the Co-Cities Project.

Section 3.2. Methodological Tools: PPOSUCs and Tactical Charters

One of the key principles of urban commons is that they should strive to be part of a broader network comprising many other urban commons as a way to create a commons movement in cities around the world. An effective way of doing that is by establishing platforms of urban commons online, where commoners can communicate with other commoners to learn from each other and create important links of commons development and governance. Such platforms exist in different forms already, including, among others, the aforementioned Foster and Iaione's (2016) Co-cities project as well as the *Remix The Commons* platform in which I have participated actively as a network member and so been able to conduct my own research.

This section will explain how these online platforms reunite commons together to advance the research of urban commons in cities, particularly by using examples of platforms that exist already as adequate methodological bases for further commons research. These networks are a nurtured platform-based commons that feed other localized commons. Such networked online platforms can themselves be characterized as peer-produced open-source urban commons (PPOSUC), which

I wish to propose here as a new type of commons used to develop and connect urban commons around the world. The aforementioned *Remix the Commons* platform, which I have been involved with in recent years, is such a PPOSUC designed to help connect various urban commons around the world.

While working on the *Remix the Commons* platform, I ended up gathering information about what I gradually came to appreciate as a crucial aspect of urban commons, so-called "charters." These collectively elaborated documents, meant to bring commoners together to define either objectives and/or governance structures of their commons project, are a rich source of data collection with which to analyze how contemporary urban commons are set up, get organized, and manage to secure a successful operation over the long haul. I have tried to organize that data in a more productive way by subjecting a representative sample of commons' charters to a discourse analysis for further identification of generalizations and specificities.

3.2.1 Free/Libre Open Knowledge (FLOK) Platforms and Peer-to-Peer Open Source Urban Commons (PPOSUCs)

The *Remix The Commons* platform, which I have been actively involved in, is an example of so-called "Free/Libre Open Knowledge" (FLOK) platforms, as is the aforementioned Co-Cities Project (https://labgov.georgetown.edu/co-cities_project/) set up by Sheila Foster and Christian Iaione in support of urban commons. Other noteworthy examples of FLOK platforms are Michel Bauwens' P2P Foundation (https://p2pfoundation.net, with P2P standing for "Peer-to-Peer"), the site discussing climate change mitigation and adaptation efforts of the world's leading cities known as the C40 City Solutions Platform (https://c40citysolutionsplatform.org), and finally the Rockefeller Foundation's Commons Project (https://thecommonsproject.org). FLOK-based platforms, which provide easily accessed and rapidly disseminating information, can do a lot of things in support of commons, such as reporting on case studies, spurring public debates about the resources to be turned into commons, and launching funding appeals. There is a risk that we end up with too many digital platforms, perhaps necessitating a central platform to which all the decentralized ones are hooked. Be that as it may, all five of these FLOK platforms have proven their potential to benefit the commons movement. With their open nature and their global reach

these online platforms play a very helpful role in facilitating urban commons to get set up and then scaled up, whether this is accomplished by fostering fruitful debates about broadening the definition of common-pool resources potentially being turned into commons, widening the applicability of commons, linking commons to other social-and-solidarity-economy (SSE) actors like cooperatives, formulating charters as propagating tool, or securing funding.

FLOK platforms connecting commoners through the internet can play an essential role in spreading ideas about commons and so help the movement. But the online dimension of contemporary 21st century commons can go even further than FLOKs. Online-based commons can be a powerful tool for participatory democracy, as argued forcefully by Michael Hardt and Antonio Negri (2004). We have to remember that many communities remain marginalized from any deciding power over how their neighborhood should be run, especially in cities. Their exclusion and alienation lead directly to socio-economic injustice against them. In order to make cities attractive for people, there will need to be a different approach to urban development catering to shared spaces that produce cultural diversity and local knowledge. As such, cities will require a system based on connecting living local traditions in order to resist modernist planning imposed on residents (Salingaros 2014). This is why commons must be peer produced. They should be posted in an open source platform capable of reuniting commons through links disseminating useful information and mobilizing shared objectives. Commons posted in such platforms, where communities have full power in circulating relevant information about the commons and expanding their objectives towards other commons-based projects, should be given serious consideration as a major innovation.

We can identify these kinds of new commons posted online as peer-produced open-source urban commons (PPOSUCs). Such PPOSUCs can serve as an alternative to top-down urban development which implicates all inhabitants and developers to allow even small ideas of development compatible with the local setting to become reality. Since a PPOSUC takes the form of an online platform serving to identify and link already existing urban commons, one can define a PPOSUC as a commons that caters to other commons - in other words, a commons within a commons. PPOSUCs are themselves organized as knowledge commons circulating information, data, and content that is collectively owned and managed by a community of users over the Internet.

Encouraging the active participation of everyone, they bring together many commoners dedicated to advance the urban commons projects they are engaged in and make those part of a network stretching across the PPOSUC. The PPOSUC's governance schemes should be such that they make it easier for members to specify the urban commons concerned, identify their respective objectives, clarify how they relate to each other, and facilitate communication or transaction flows aimed at allowing the commons to partner up or learn from each other. Because they are embedded online, PPOSUC-based commons can also easily construct additional operational layers through their technological capacity for interconnectivity. This technology can obviously help a great deal in realizing Ostrom's (1990) design principles for collective governance as well as "nested tiers [of governance] from the lowest level up to the entire interconnected system." For all of these beneficial reasons we should discuss the digital architecture of commons and make that aspect a focus of greater attention in the future development of commons literature.

There is an added benefit to urban planning when using an open-source platform to launch improvement and construction projects in neighborhoods. Through this form of urbanism, PPOSUCs will act as communal spaces that connect geographically separate people with each other, helping residents to learn from each other (Salingaros 2014). Online communication gives people easy access to different ideas and experiments when co-producing a PPOSUC and using it for decision-making. Such ideas and experiments in the area of commons rely often on trial-by-error learning, backed by evidence. The kind of online communication organized on PPOSUCs will allow people to study the evidence of cities which are successful in adapting new ideas of commons or urban lifestyles to their local conditions. Online communication also encourages the participation of construction firms or cooperatives, which have deservedly earned a good reputation and therefore ought to be used again by communities. The entities will then be able to foster ongoing communication and identify reliable business opportunities which contribute to the overall improvement of a neighborhood. PPOSUCs encourage commoners to publish knowledge and improve it so that other people can customize that information for adoption of identifiably successful tactics in their own neighborhoods to suit their environment and lifestyle. PPOSUCs foster educational and informational channels that build upon local adaptation and traditional techniques, bypassing the sort of development controlled by elites (Salingaros, 2014).

In addition, the PPOSUC concept relates directly to Karin Bradley 's (2015) "open source urbanism" both of which can be further advanced in the dynamics of social media, where users are able to provide inputs through tweeting, blogging, analyzing news and stories, co-producing the content in the physical realm (Salingaros 2014). The ethics and practices of sharing information, collectively working together, and pooling resources to solve common problems have surfaced with open-source movements, which have rendered schemes for sharing goods and spaces more popular (Bradley 2015). Online sharing through open-source platforms has promoted offline sharing, which empowers residents and encourages them also to follow an ethics code when co-producing and sharing physical sources (Rachel & Rogers 2011).

One can then conclude that these forms of open-source platforms for urban development have contributed greatly to the notion of a sharing economy, which is defined as an economy built on distributed networks of connected individuals and communities who share underutilized assets from spaces, products, and skills for monetary or non-monetary benefits (Botsman & Rogers 2010). The concept of the sharing economy corresponds to the movements of P2P urbanism that promote a socio-economically fair and just system of economic development and lifestyle. Yochai Benkler (2005) has argued that common-based peer production increases the capacity for innovation to occur through online sharing and social media not only with regard to non-rival digital goods, but also in traditional goods like food, clothes, equipment and other products. This may open opportunities for new and existing industries and sectors in the economy, thereby boosting the entire economy as a whole and allowing it to benefit everyone. This open source culture with respect to urban planning can then transform the urban environment by "*Bringing the idea of the common into play with a spatial justice perspective, then, allows us to sharpen our analysis of the task at hand – the decoupling of life in the contemporary city, the state and forms of governance from the reproduction of the logic of capital and capitalist work, and in its place a radical commonization of the production of urban space and everyday life in the city."* as stated by Paul Chatterton (2010, p. 628, recited in Bradley 2015). Such a mindset gives way to PPOSUCs becoming major hubs of innovation, knowledge, cultural diversity, and added value for all participatory residents.

To sum up, peer-produced open-source urban commons (PPOSUCs) can provide a myriad of benefits to multiple local residents, collectives and government agencies. First of all, the interconnectivity and accumulation of shared knowledge in PPOSUCs makes it that much easier for people to design and modify their own institutional arrangements for a public space, which gives them the freedom to manage the space based on what is best for the local setting. The arrangements consist of rules, norms, guidance, and new ideas of management designed by the people themselves. Seeing others succeed, as PPOSUCs are prone to record, motivates one's own engagement and then recording it. Second of all, the nature of open access in spaces allows people to use the space without any restriction. People will be able to interact with each other and participate in cultural activities, giving them the opportunity to learn about ethnic and social backgrounds other than theirs. Third of all, people can use this space for production processes that will benefit them greatly. For example, some community gardens are devoted to growing local foods for nearby residents, making the process of food consumption more sustainable and less costly. PPOSUCs can play a useful role in figuring out best practices to bring local producers and consumers together in direct interaction. Finally, these PPOSUCs become hubs of knowledge creation and innovation. As people provide and share their own inputs of institutional arrangements, other urban areas can try those out as an example to improve their own neighborhoods. People also learn about the biology of the given area by becoming familiar with the flora and fauna developed in these spaces. They can also spread knowledge regarding the production processes of byproducts developed in these PPOSUCs and adapt them for greater resiliency and climate change mitigation.

Such benefits cannot be ignored, to the extent that they encourage people to become empowered and more knowledgeable about certain processes in urban settings. They must therefore be considered for the future development of urban commons as we urgently look for effective solutions for climate change. Given these notions of PPOSUCs as enablers and hubs of commoning practices, these online platforms become a tool for commons analysis. More specifically, they become a database for observing and learning about commons governance. This thesis uses PPOSUCs for precisely that purpose, and an example of that will be shown in the next section. There I introduce a PPOSUC called *Remix The* Commons which I worked on as a database for analyzing chartering practices.

3.2.2 The Remix The Commons Platform

Much of the data and information gathered for this research came directly from the platform of *Remix The Commons* (www.remixthecommons.org) in which I continue to be an active member. My contribution to this platform has been to document observed commons throughout Europe. *Remix The Commons* is an organization that contributes to the development of the commons movement. It is based on an open platform that has the same layout and functionality as a Wikipedia site. It is therefore an open-source outlet, meaning that anyone can modify, add, or edit specific pages devoted to commons, and it is freely accessible. This signifies a potentially vast range of users from academics to activists contributing to the website, creating a large variety of content and perspectives available. The value of this kind of open platform is based on aggregating all commoners together to share information transparently, and co-creating tools, such as documents, methods, projects, and actions for commoners. Its main initiative is to create a network of commoners who are tasked with enriching the knowledge and initiatives around the commons and its movement.

The *Remix The Commons* platform shares a lot of similarities with the Co-Cities Project, especially when comparing the methodological tools used for analyzing the commons. The platform builds on the contributions of commoners and analyzes existing tools and practices in the world of commons. Participating commoners provide lots of useful information about their respective commons, especially how they have evolved over time. Linking all that information together allows the commons to be classified by type, location, and methods for action. Such a classification system enriches the content and provides information on specific commons and their various initiatives and goals not least also for comparative analysis. For example, if one clicks on a specific type of concept, such as ecological commons, access to all the ecological commons documented on the platform will be directed to the user.

The *Remix* platform has documented several different types of commons. Such documentation goes beyond general information concerning the type of commons, its location, and specifics on the community involved. One of the principal goals of the *Remix* platform is to provide visibility to specific commons' tools that are normally elusive or easily missed. Perhaps the most important

aspect in this regard relates to the legal context of commons, a dimension of great complexity which is often overlooked or analyzed only tangentially. The success of commons often depends on receiving official recognition from public authorities. This is typically a two-way process. On the one hand, laws and regulations imposed by public authorities have to be understood and interpreted by commoners in ways that allow the commons to exist. On the other hand, commoners have to create a system of shared self-governance for the commons that is autonomous from market and state, but legally approved in terms of clearly laying out what such governance consists of. It is only by making their commitments and obligations explicit that commoners can be sanctioned if they fail to follow those engagements. Often that dual nature of the legal context, following the laws and regulations of the authorities while establishing explicit rules for collective self-management endowing the commons with legal credibility, has taken the form of charters. These are official documents setting out the rights and duties of commoners in creating and maintaining their commons. The *Remix* platform has made a point of highlighting such charters for everyone to see and learn from. All of this enriches the commons movement.

3.2.3. Tactical Charters

This section introduces the key concept of "tactical charters" by taking a series of charters defining specific urban commons which I analyzed while working on the *Remix the Commons* platform. These charters, collectively elaborated by commoners either to launch a new urban commons project (which I term "formative charters") or to secure the long-term viability of an existing commons (which we classify as "directive charters"), are a rich data source for qualitative participatory-action research, notably discourse analysis helping us identify overlapping features and key differences among those documents. My textual analysis of ten charters discussed in this chapter (see section 3.3) aims to highlight in the process tactics used to create and maintain governance schemes in accordance with the needs of the communities involved. The notion of "tactics" or "tactical" I introduce here refers to the writing and dissemination of a commons-defining document as an act of "commoning" aimed at an end beyond the immediate action, the end being here launch and/or preservation of an urban commons. In that sense, the charters provide meaningful insights into what motivates urban commons to be set up and what sustains them over time.

The people behind the *Remix* platform, including myself, are tasked with documenting practices of self-organization and governance as well as the production of new legal mechanisms to understand how such commoning practices fit within the context of specific commons. We use related content of commoning experiences, hence end up searching for reliable records of commoning practices taking place within a commons. We are especially interested in producing knowledge useful for action oriented towards the ecological and social resilience of the city. *Remix The Commons* agglomerates social experiences located in different settings to co-construct a common knowledge base about the governance of urban commons. The participants in the project document their conditions and the challenges they face for a widely shared reflection on the tactical use of methodological, socio-technical, and legal tools governing commons. Commoners of various stripes can interpret these tactics together from several perspectives in order to provide different strategic options within a range of urban practices.

While analyzing various urban commons for the *Remix* platform, I became gradually drawn to their respective charters. Of particular interest to me early on was the amazing effort by several communities around the Falkirk region in Scotland, strategically located exactly equidistant between that country's urban centers of Glasgow and Edinburgh, to write a Community Charter in defense of what these communities cherished about their environment and community while opposing a proposal for natural gas drilling in their region. This document illustrated very well how commoners might develop a charter, detailing eight steps which, when taken together, make it obvious that formulating a charter is itself an act of commoning. These eight steps are:

1. Identify the need that your community has for a charter.
2. Gather a community group that takes responsibility in presenting the finished charter on behalf of the community.
3. Make a charter-making group that reaches out to as many organizations and individual citizens in the community as possible.
4. Assemble a meeting to devise a series of questions for community conversation.
5. Use the series of questions to branch out to as many people as possible (even those who may not have access to the community conversation).

6. Host a space to have that community conversation and prepare the organization of that conversation.

7. Hold the community conversation to assess how the charter should be presented.

8. Collect all of the notes from the community conversation and turn them into assets and values.

These steps represent a need for participation, in particular participatory planning. They also call for a conversation to happen between people sharing the same interest, but who may have different methods of achieving it. This may lead to conflict. But the whole point of a community conversation is to come up with ways and tools to discuss those conflicts and eventually resolve them. Furthermore, these steps also call for a level of organization in terms of which roles each commoner assumes and so link people to their skills. Ultimately, we can view these eight steps of the Falkirk Community Charter as a case study how the collective elaboration of a charter can serve as a blueprint for active commoning measures to achieve a collective governance scheme.

Activists working on the *Remix The Commons* platform have paid a lot of attention to charters. These documents provide an official understanding of the commoning processes aimed at building a functioning collective governance scheme for the commons. Charters, defining a community of signatories, formalize the rights and sovereignty of individuals comprising that community which is bound together by the resource(s) its members are committed to manage collectively. Communities, formed to respond to needs, play the key role in producing commons and their charters. They draw their energy from the dynamics of refusing inequalities and from the register of social innovation with which to invent alternative social relationships based on collaboration. Communities commit to actions of commoning. Commoning practices, which link the communities to the social and environmental aspects of their territory and are implemented collectively in a polycentric as well as decentralized manner, are typically laid out explicitly in charters. Those documents are therefore a good source when doing analytical research on the commons, because they summarize the commoning processes taken to make the commons legally approvable. By analyzing charters, researchers can have a better understanding of the commons and how they implant themselves in a territory.

I have been a member of the *Remix the Commons* platform working on charters for several years now. Typically, I would obtain specific charters of commons online and upload them directly onto the platform, but on occasions they were taken from brochures and then scanned onto the platform. A page was created for each case study to which I could attach the relevant charter. I then read and analyzed the charter to gather some information about its content, both to gain insights about its commons and also to relate it in more systematic fashion to other charters I analyzed. I searched for each charter's location, its main objective, tactics used to reach that objective, and the commoning processes undertaken by communities to render a shared resource or space into a commons. I also uploaded other documents which provided information on the chartering process or on the commons itself, and those documents would all be attached to the same page as the case study. After analyzing all the documents linked to the charter of each case study, I was able to identify specific tactics that each community used in the commoning process to make their charter. If such details were not specified adequately, I would search for supporting documents and post them to explain different articles or claims in a charter. Often enough, such supplementary information centered on relevant acts of commoning.

Charters are indispensable for commons research as sources of information on the resource(s) to be turned into a commons, the commoning tactics, and the relationship with the local government. The charters themselves provide information about what commoners use as legal tools as well as their communication and co-production processes. Various tools are used so that commoners can respond to social, economic, or ecological problems while protecting the rights of use and access to certain shared resources or creating spaces for collaboration. While analyzing charters, I eventually ended up focusing more and more on identifying observable patterns and exploring how those reflect specific approaches to commons governance.

As a result of this work *Remix The Commons* has launched a project of mapping charters and documenting practices and tools around them, an "Atlas of the Charters of Urban Commons" (https://wiki.remixthecommons.org/index.php/Atlas_des_chartes_des_communs_urbains). This "atlas of charters" contains several case studies of urban commons. Each case study describes aforementioned tools and classifies them through themes and concepts so that case studies can be linked to one another in a whole informational ecosystem. Most charters have descriptions of the

collective actions and decisions taken among commoners to arrive at this or that policy decision. These descriptions provide a good basis to obtain analytical information on the chartering practices underpinning each urban commons.

In addition, such detailed information allowed me to categorize the case studies based on the type of commons, type of actions, and objectives using the concepts that were organized within the platform. Categorizing each case study along those lines revealed links between different commons that are in different contexts but follow similar tactics. Depending on the context, we can compare certain practices with one another, identify the successes and failures of each tactic, and come up with general conclusions about a commoning tactic. Such observations have led me to formulate principles of commoning tactics that I would then use to enhance my research of specific case studies. Such an atlas can help scholar-activists identify commoning tactics which they can adapt to certain urban contexts.

Section 3.3 Results from the Discourse Analysis of Tactical Charters

Looking at the decision-making giving rise to a charter, we can understand much better how communication is fostered between residents, organizations, and municipalities, a dynamic that is crucial to this type of commons research. In my own contributions to the "Atlas of Charters" I have tried hard to preserve the unique personality of each commons, made up of its own group of people and responding to their specific needs. At the same time, I have also sought to find links between various urban commons for the purpose of categorization to help group them together as a paradigm. I have thus been able to outline such an urban commons paradigm by aggregating the research on all case studies together and finding linkages between each commons experience, whether on the basis of their goals, be they ecological, economic, social, or cultural, or on the basis of their tactics deployed. By tracing differences and complementarities in the commoning processes of specific urban commons, my research might help other organizations interested in commons, particularly in their procurement, preservation, and their functionality in specific areas. The idea here is to help clarify what the commons space could be used for so that community-oriented organizations hear out the needs of the people intending to use this space.

Charters will have different strategic purposes, depending on the kind of urban commons they serve. If they apply to a local, stand-alone project, in which case we refer to them as "internal" charters, they focus primarily on defining objectives, commoning tactics, and/or governance structures which give that self-contained commons its specific identity. If, on the other hand, they relate to urban commons projects which are part and parcel of a broader social-solidarity-economy configuration, whereupon we have what I like to refer to as "external" charters, we see that in these instances the charter aims primarily to contextualize the urban commons it represents within that more ambitious initiative of societal transformation and define its role in relation to the other elements of the SSE-rooted initiative.

Another pertinent distinction emerging from our discourse analysis of various tactical charters in our effort to group them together into an "Atlas of Charters" relates to their timing, which defines their role in the life cycle of an urban commons. At times, charters play a defining role in getting a new urban commons started, set up, and ready to serve its community. These can be classified as "formative" charters. More often than not, however, the charter gets formulated by the commoners of an already established urban commons to anchor it better in the community, clarify the modalities of its functioning, and/or gain legal protection from the local authorities. In such instances, we speak of "directive" charters.

I have consistently used the notion of "tactical" in connection with charters not least to pinpoint their importance as an act of "commoning" aimed at a broader set of objectives that reach beyond just writing up a document. The commoners' efforts at discussing, finding consensus, soliciting input from outside parties, structuring the key points, collectively elaborating the text word by word, and disseminating their charter make explicit as chartering practices how to define the commons thus described in its unique presence.

When looking at what connects the charters in terms of what they share and also what sets them apart in their unique specificity, we can identify four community tasks as the engines driving the urban commons – getting the community involved; identifying the physical and social aspects and possibilities of common space; using collective action amongst stakeholders and democracy; achieving permanency.

I have elaborated these thematic results of my research in greater detail by bringing them all together in what I like to call the "tactical chartering manifesto" with the purpose of thereby providing a sort of cook-book for commoners to make a charter. This tactical chartering manifesto (further detailed in the Annex of the thesis) is not only a cook-book that can be used for commons all around the world, but should also prove useful in structuring my three case studies presented in chapter 4 to highlight the principles and governance schemes of each urban commons presented there.

3.3.1 Analysis of Charters

To understand how charters work in conjunction with the governance of the commons, it is important to identify and analyze them as the groundwork for setting up a commons. I collected charters that were devoted to the ecological transition, promotion of culture in the neighborhood, or responses to specific socio-economic crises involving a marginalized group. These charters represent projects for commons that have been set up with a functioning commons-based governance and, while often still in a development phase, aim to be viable in the long run. For the purposes of presentability within the confines of a doctoral thesis I made a selection of charters to be discussed here, focusing on eleven of the twenty-three included in the "Atlas of Charters" on the *Remix* platform. Three of those eleven charters, the ones for the Bassin Versant Solidaire de Forest, Agrocité, and Murs à Pêches, became foundations for more extensive case studies presented in chapter 4. I will therefore refer to them in greater detail there.

Here is a list of the eight remaining urban commons whose charters we have subjected to a discourse analysis:

Association Ecoquartier (http://ecoquartier.ch) in Lausanne, Switzerland is a collective group of ecologically-minded individuals focusing on building mini neighborhoods and eco-habitats that are zero-carbon emissions, low waste, and with a recycling network by using the knowledge and actions of its own residents at the neighborhood scale. They provide a charter called "MetamorphOSONS" highlighting details of their governance and tactics used to get there.

Association du FONJEP (for Fonds de cooperation de la jeunesse et de l'éducation populaire; https://www.fonjep.org) is an administrative consulting group based in Paris aiming to provide commons-based forms of education for children in poorer families through collective engagement of rules decided by various stakeholders. Their goal is to render 'popular education' as a commons. Their charter highlights governance schemes that were decided amongst members through sharing of knowledge and associative activities of commoning.

The TERA Cooperative (http://www.tera.coop), located in the Lot-et-Garonne department of Southwest France as an experiment in constructing an alternative cooperative eco-system, also has a charter for its housing commons based on autonomy through shared rules of co-habitation. Their charter provides the tactics used to achieve an autonomous shared governance for its housing commons. They consider themselves a cooperative that builds housing commons for neighborhood residents and marginalized groups.

Shakirail (https://shakirail.curry-vavart.com) is a cultural urban commons in the 18th district of Paris where commoners occupied an old building that was once used by train companies. In this space, they host cultural events such as theater, art, movies, and a space where artists in the neighborhood can share and collaborate together. They are considered to be a rather prominent but autonomous cultural organization for the northern parts of Paris.

We also looked at the *Bologna Regulation for the Care and Regeneration of Urban Commons* (http://www.comune.bologna.it/media/files/bolognaregulation.pdf) which I mentioned already earlier (in section 1.5.2) and which is well discussed on the interesting web site Cities of Service (2018). This "regulation" illustrates well how a municipal government might collaborate with its citizens to develop urban commons and make them a part of the constitution, especially as citizens seek to occupy spaces and structures that are abandoned or underutilized by the local authorities. The sets of rules are provided in the form of a charter as well.

There is also the *Concerned Communities of Falkirk's* (CCoF) Community Charter, which I had already mentioned earlier in section 3.2.3. This document is based on the collaboration and co-

creation of community councils in the area of Falkirk in Scotland to halt the extraction and drilling of natural gas in order to preserve the environment. The charter highlights which rules and norms were collectively decided upon in order to realize the goals and ambitions in preserving the local environment that would otherwise get degraded by natural gas drilling. As explained by the Scottish Community Alliance (2014) as well as Mothiur Rahman (2018), these communities around Falkirk used the organizing tool of a Community Charter to present a commons-based alternative to industrial development of their natural area.

The *Commons Josaphat* (https://commonsjosaphat.wordpress.com/commons-josaphat/) is a platform located in Brussels aimed at developing commons of various stripes in a 40-hectare vacant space. Their charter is an over-encompassing guide to view the city's spaces as a commons. As explained by Silke Helfrich (2013), the commons-based platform addresses issues that are favorable to commons development, such as the environment. It provides rules and norms decided by certain residents in Brussels to occupy spaces and come up with collective governance schemes that favor the objectives of the citizens. Their charter reflects these commoning tactics.

Hotel du Nord's *H2H Cooperative* (https://www.hoteldunord.coop/en/le-processus-cooperatif-h2h-en-recit-2/) is a project based on providing a commons-based approach to tourism in Marseille. It promotes cultural activities led by the citizens of Marseille, and contains a charter on how a commons-based approach to hosting citizen-based culture can help forge specific benefits of tourism to the citizens, rather than large companies.

In Table 3.1 we classify all eleven charters, the eight introduced above and the three forming the heart of our chapter 4 case studies, based on the resource they create, location, the community they serve, the objectives of the commons, and the strategic position of the charter therein.

Table 3.1. A summary of the charters analyzed

Urban Common	Resource	Location	Community	Objective	Charters and their Highlights
Association Ecoquartier	Eco-Habitats and Zero Carbon Neighborhoods	Lausanne, Switzerland	Internal - Collective Group of Residents	Creating neighborhoods with recycling networks, low waste, and knowledge transfer	Formative - "metamorphOSONS!" detailing governance tactics for setting up these eco-habitats
Association FONJEP	Administrative Consulting Group of "Popular Education"	Paris, France	External - Association with Various Stakeholders in the field of Education	Render "Popular Education" as a Commons for Children in Poorer Families	Directive - FONJEP Charter as a driver of governance schemes decided amongst members through sharing of knowledge and associative activities
TERA Cooperative	Experimental Shared-Housing Commons	Lot-et-Garonne department in Southwest France	External – Cooperative with several neighborhood residents and marginalized groups	Build housing commons for marginalized neighborhood residents	Directive - TERA Charter as a driver of autonomy through shared rules of co-habitation to achieve autonomy in governance of housing
Shakirail	Occupied building used as Cultural Commons Site	Paris, France	Internal – artists of the 18th District of Paris	Host cultural events in theater, art, movies, and art collaborations	Directive - Shakirail Charter as a driver to produce an autonomous cultural organization
Bologna Regulation for Care and Regeneration of Urban Commons	Regulatory Framework	Bologna, Italy	External – Citizens and Municipal Departments in Bologna	Collaboration among citizens and municipalities to occupy abandoned spaces and structures	Formative - Bologna Regulation highlighting sets of rules to occupy buildings and set them up as commons
Concerned Communities of Falkirk	Community Councils representing the bioregion	Falkirk, Scotland	External – Councils and residents of Falkirk	Halting the Extraction and Drilling of Natural Gas for environmental preservation in the bioregion	Formative - Falkirk Community Charter highlighting the rules and processes of collaboration and co-creation to set up these community councils
Commons Josaphat	Occupied "commons space"	Brussels, Belgium	Internal – residents around the area of the commons space	Occupying and preserving spaces for communities for environmental purposes	Formative - "Make your own city" used to launch a project of collectively decided rules and norms for collective governance

Hotel du Nord H2H Cooperative	Community-managed cultural sites	Marseille, France	Internal – citizens in certain neighborhoods of Marseille	Provide a commons-based approach to tourism in Marseille	Directive - H2H Charter as a driver for hosting citizen based cultural events and accommodation
Bassin Versant Solidaire de Forest	Watershed	Brussels, Belgium	Internal – residents living on the watershed	Manage the watershed as a commons to find innovative solutions to floods	Formative - "Actes de Naissances" highlighting tactics to set up the watershed management as a commons
Agrocité	Urban Resilience Farm	Gennevilliers, France	External – residents and cooperatives of the Agnettes housing projects	Build and manage a farm that produces locally grown food and short circuits for recycling	Directive - R-Urban Charter as a driver for improving the management of "Agrocité"
Murs à Peches	Cultural Heritage Site	Montreuil, France	Internal – Associations making up the Federation de Murs a Peches	Protect the site against private development and host cultural/ecological events such as a festival	Formative - Pacte de Collaboration de Murs a Peches to set up a communication channel with the municipality to host a festival

3.3.1.1. Internal Charters versus External Charters

In many cases, charters vary in user base. For some charters, the community is very strictly defined and adapted to a local context. For others, the user base extends well beyond the immediate users of a resource. It is therefore important to distinguish whether the chartering process involves a tightly knit community that is formed on the sole basis of the common resource itself or whether it includes external actors, forging a community that is beyond the immediate usage of the commons itself. Most of the eleven charters discussed here in this thesis apply to locally grounded urban commons serving community needs within well-defined residential neighborhoods. In those highly localized settings the charters serve the tactical purpose of connecting the resource concerned to the community of its users and integrating both into a functioning commons for collective self-management. They are what we might best consider to be "internal" charters, as they focus inward towards a community of actual and potential commoners.

Association Ecoquartier launched its push for an ecologically sound neighborhood with a charter entitled "metamorphOSONS!" (https://issuu.com/ecoquartier.ch/docs/metamorphosons) containing 140 recommendations for environmental initiatives by the local residents of northern Lausanne's Plaines-du-Loup quartier. Switching from the small-case "metamorph" (indicating the intent of transformation as in "metamorphosis") to the capitalized "OSONS!" (best translated as "let us dare!") and punctuating this call for collective action among "us" with an exclamation mark at the end indicates a willful attempt to anchor the urban commons' objective in the charter's name. Subsequent titles from the association's list of publications, notably "CONSTRUISONS ENSEMBLE!" (2012), "VIVONS ENSEMBLE!" (2015), and "RÉINVENTONS LE BIEN VIVRE ENSEMBLE!" (2020), confirm the pattern of addressing the potential target group directly with a command for action while now using only capital letters for added urgency.

The Artists' Collective Curry Vavart (https://curry-vavart.com) used a legally formalized "accord d'occupation" (literally "occupation agreement") with the French railroads company SNCF to turn an abandoned building complex the latter owns into a multi-cultural arts and community center serving multiple users in the La Chappelle Marx Dormoy neighborhood of Paris' 18th district. The name for that revived public space combines reference to its earlier control by for the railroad company ("rail") with its revived use as a hang-out place ("shak") to give you "shak/rail" which can be more usefully put together in one flowing name "Shakirail."

The Commons Josephat (https://commoning.city/project/brussels-commons-josaphat/) is a Brussels-based independent citizens platform bringing together local residents, neighborhood activists, and participative associations in support of a local urban development project that would protect the city-owned 24-hectar Josaphat site, an abandoned railroad yard later (in 2013) turned into a re-wilded biodiversity haven, against current city plans for private housing development. There has been fairly massive citizen resistance to such a top-down plan, but the association behind the push to turn Josaphat into an urban commons has developed an alternative vision for the site's socially balanced and ecologically sustainable redevelopment which includes, among other initiatives, social housing, a progressive neighborhood school, a cooperative, and an energy producer, all working together within a horizontal, participatory governance structure. Its charter, entitled "In case of emergency make your own city"

(https://wiki.remixthecommons.org/index.php/In_case_of_emergency_make_your_own_city), is internal in the sense that it addresses local residents in the surrounding area of the Shaerbeek district and is the product of ongoing discussions among two working groups and a general assembly taking all decisions together.

The social-solidarity tourism platform Hôtel du Nord (https://www.hoteldunord.coop), legally endowed as cooperative (in France an officially recognized status as a "société cooperative d'intérêt collectif" or SCIC), offers visitors to its neighborhood on the northern outskirts of Marseille an array of eco-tourism services including affordable shelter, neighborhood walks, local produce (like honey), artisan workshops open to public participation, and documentations of the area's rich social history. It has developed "internal" documentation (https://wiki.remixthecommons.org/index.php/Coopérative_de_résidents_Hôtel_du_Nord) in which leading members of the coop specify their action plan for a set of social-tourism services.

The Bassin Versant Solidaire de Forest is a watershed commons, involving an entirely original approach to flood management that stands in direct opposition to the municipality's top-down, structure-heavy, and centralized water-flow management. The citizen action network dealing with Brussels' increasingly disruptive flooding and water-flow challenges, known as "États Généraux de l'Eau à Bruxelles" (https://www.egeb-sgwb.be), published an "Acte de Naissance" declaration in 2013 to present to the residents of the southern Forest district of Brussels its vision of local flood control and the decentralized "new urban rivers" architecture of water-flow channels, based on extensive group exploration walks and mapping exercises.

Montreuil's legendary heritage site Murs à Pêches on the eastern outskirts of Paris, once famous for its peaches in a region of France not prone to accommodate growth of this fruit, has been turned into a cultural-ecological commons thanks to the Fédération des Murs à Pêches (https://federationmursapeches.jimdofree.com/la-fédération/). That umbrella of neighborhood associations is committed to defend this precious "green" area against environmental degradation and urbanization plans of private developers carrying weight in local government. The members of the Fédération MAP have concluded a "pacte" as a sort of "internal" charter laying out their

shared commitments to defend the space and preserve its urban-commons nature for the benefit of the public (https://federationmursapeches.jimdofree.com/le-pacte/).

Then we have so-called "external" charters which are primarily oriented towards connecting an urban-commons project to a bigger activist network or social-solidarity-economy project. Here the document in question addresses a wider audience and justifies an urban commons to exist within a broader institutional framework.

The "Fonds de cooperation de la jeunesse et education Populaire" (FONJEP) is a non-profit organization, supported by both national government and municipalities, promoting community-based projects for the youth and popular education initiatives. FONJEP's mission statement (https://www.fonjep.org/nous-connaitre/missions) clearly aims to link its participatory projects for the young and in education to a broader vision, if not altogether network, of an alternative socio-economic model that roots itself firmly in the social solidarity economy.

The Association TERA is a cooperative which has claimed a certain territory in the Lot-et-Garonne region of south-western France on which it is implanting an alternative eco-system using innovative methods of agriculture and food processing, forest gardening, construction, waste management, communication, and governance. The cooperative lays out its vision in the opening page of its website https://www.tera.coop, firmly anchored in the social solidarity economy. It promotes a wide variety of partnerships with like-minded non-profit organizations and regional government agencies while lobbying actively for support in the wider populace. While mostly rural in its territorial orientation, it has affordable-housing ambitions which make it relevant as an example of urban commons applicability.

The "Regulation on Collaboration between Citizens and the City for the Care and Regeneration of the Urban Commons" is a unique policy document, in that sense an "external" charter of a city government (http://www.comune.bologna.it/media/files/bolognaregulation.pdf), which provides for cooperation between municipal agencies and neighborhood actors to revive abandoned public spaces and run them as urban commons.

In 2013 communities in the Falkirk region of Scotland, grouped together as Concerned Communities of Falkirk in opposition to Dart Energy's plans for unconventional gas drilling in the area, wrote a "Community Charter" (https://wiki.p2pfoundation.net/Community_Charter) as a rights-based document defining all the things mattering most to the present and future well-being of the community in terms of "intangible assets" (e.g. clean environment, community stability, affordable housing, children safety, food security, rich eco-system, trustworthy representatives) and specifying rights and responsibilities of the planning process securing those assets. The Falkirk Charter is clearly an "external" charter, both in terms of transforming local politics and also as a blueprint spreading this kind of citizen initiatives to other places.

The urban resilience farm Agrocité in the Gennevilliers suburb on the western outskirts of Paris (https://wiki.remixthecommons.org/index.php/Agrocité_de_Gennevilliers) does not have its own charter. But it is part of a broader urban commons strategy formulated by the Paris-based collective Atelier d'Architecture Autogérée (https://www.spatialagency.net/database/aaa) which these radical urban architects have termed rUrban (www.r-urban.net) for which there is a charter, one that is clearly "external" in that it is geared to advertise and promote a network of original urban-commons projects meant to strengthen the communal resiliency of otherwise marginalized neighborhoods, including much wider use of recycling materials, new construction methods, urban farming, participatory education.

3.3.1.2 Formative Charters versus Directive Charters

Charters come in a variety of forms and are used for different purposes. It is important to understand key differences between charters, such as when they are used to set up commons or when they are used as a driving force to propel the commons forward. These aspects emerge from the discourse analysis of tactical charters and concern when in the life cycle of a commons the commoners saw it fit to put their project down in writing so as to have a charter as tool of mobilization. Since chartering practices come in a variety of forms, it is important to distinguish when charters are used to create a commons directly from the beginning, or whether the charter is used to drive the commons forward in their objectives. I therefore distinguish these two categories and label them as either formative or directive. Often enough the charter occurs near the beginning,

when it serves to launch the commons or help it find its footing as a communal project getting actualized. In those instances, the charter is "formative" as it helps to "form" (i.e. set in place) the commons concerned. We have here six such formative charters:

The "metamorphOSONS!" charter (http://ecoquartier.ch/metamorphosons-recommandations-urbanistiques/) is "formative" in the sense that it summarizes a six-months-long discussion among thirty professionals and community activists from many different backgrounds how best to transform their gritty neighborhood on the outskirts of Lausanne into a more environmentally oriented, livable, communitarian quartier. Here the charter turns a discussion group into a neighborhood collective aimed at mobilizing the local population around shared goals and agreed-to action plans.

The "Make Your Own City" charter of the Commons Josaphat is clearly "formative" in nature inasmuch as it aims to mobilize neighborhood residents in Brussels' diverse and densely populated Shaerbeek district against the city's commercial urban-development plans for a strategic site, which the municipality is seeking to impose without citizen participation, and in favor of an alternative commons-based public space serving the surrounding community in a variety of socially oriented and environmentally oriented ways. The charter is used to potentially transform a vacant site in to neighborhood for "commons" and focus on newly implemented commons-based projects of experimentation in those sites. That localized focus illustrates how the charter contains important elaborations of how public space can be organized as citizen-governed commons, innovative social housing, urban ecology, alternative finance models, and "green" energy production and distribution.

The so-called "Bologna Regulation on Public Collaboration for Urban Commons," putting into practice Foster and Iaione's (2016) vision of a "city as commons," can be considered a "formative" charter to the extent that it sets up a detailed regulatory framework for the occupation of abandoned buildings and their governance as commons, with the support of the public bank Fondazione del Monte di Bologna e Ravenna (https://www.fondazionedelmonte.it).

The Falkirk Community Charter is clearly a "formative" charter inasmuch as it launched an intense community effort to reshape local politics and government in the direction of prioritizing sustainable development goals. It also formative in the literal sense of providing a model for these kinds of charters being used elsewhere in the United Kingdom. Since then there have been additional Community Charters launched in other parts of Britain, as tracked by the Community Chartering Network (https://www.communitychartering.org/community-charters/).

The R-Urban Charter of the radical architects and urban planners grouped together in the Atelier d'Architecture Autogérée (AAA) collective can be classified as a "formative" charter launching an entire network of inter-connected initiatives in the burgeoning social solidarity economy around Paris, of which the urban resiliency farm Agrocité is one element. It should also be noted that the Agrocité urban farming model has been replicated elsewhere in Greater Paris.

The "Actes de Naissance" of Brussels-based community organization Etats Généraux de l'Eau à Bruxelles (https://www.egeb-sgwb.be/article335.html) is, as the name implies, a "formative" charter inasmuch as it introduces a new community-driven approach to controlling floods, a problem very likely to intensify with growing climate-change instability and hence posing a growing challenge to municipalities in need of practical solutions accepted by residents.

We can also look at the Fédération MAP's "Pacte de Collaboration de Murs à Pêches" as "formative," not least because it sets out the priorities and principles of the collaborative effort (https://wiki.remixthecommons.org/index.php/Murs_à_Pêches_de_Montreuil). But we should also recognize a "directive" dimension to this charter, as it serves in various iterations of renewal to solicit commitments of support from local politicians in the run-up to municipal elections, thus trying to secure legal protection for its long-term survival.

The reference in our last example to MAP's "Pacte de Collaboration" also being a "directive" charter (and not just formative) points to situations when charters get formulated by members managing existing commons to render explicit their mission, clarify rules guiding their operations, put in place appropriate governance mechanisms, facilitate partnerships, or gain legal acceptance

from local authorities. Such charters, aimed at the long-term survival of already established commons, can be categorized as "directive" charters of which we discuss five.

The mission statement of FONJEP constitutes a "directive" charter inasmuch as it seeks to embed its organizational super-structure in the broader framework of the social solidarity economy, while nudging government organizations in that direction. This political orientation is also clearly in other communication outlets of FONJEP, such as its YouTube videos introducing itself to a larger audience (https://www.fonjep.org/modeles-socio-economiques/de-quoi-parle-t).

The TERA cooperative has a very "directive" charter clearly laying its many avenues of collective engagement and development phases of its projects, while also seeking legitimating or resource-facilitating partnerships not only to strengthen its organizational capacity but also to push its deeper vision of a social solidarity economy as alternative to contemporary capitalism (https://agora.tera.coop/cloud/index.php/s/XSPs9zFk4kyLsee).

The agreement ("convention") between the SNCF and the Collective Curry Vavart guides the usage of a large public area referred to as Shakirail, with two buildings of 800 m^2 and 600 m^2 plus 2000 m^2 of green space. Its provisions reflect the purpose of a multi-disciplinary association to create a cultural and social neighborhood center serving different community organizations while combining artist workshops, recording studio, a theater, a music hall, offices, a soup kitchen, and community gardens. While initiating the building complex as an urban commons and giving it legal status as such, it also serves as a "directive" charter directing its multi-faceted use by a collective in cooperation with other neighborhood associations. That network, with the Currey Vavart collective as its center, is now fighting for the survival of Shakirail, threatened by plans of the city municipality to build fire stations and other public-sector services in its stead.

The Hôtel du Nord cooperative has tried to integrate its social-tourism services within a broader national hospitality platform H2H and follows the so-called Faro Convention principles for the democratic preservation of cultural heritage. To the extent that documents by the leaders of the coop make up a charter, they can be considered a "directive" charter inasmuch as its main points

seek to embed the cultural-heritage commons of a unique and historic neighborhood within a broader network of alternative social and ecological tourism.

3.3.2 Tactical Charters as Sources of Commoning Activity

Charters provide a good source for analyzing tactics of commoning. They show that charters are the correct tool to understand how commons have evolved from being set up to being run for the long haul and even becoming replicable by others. Because of their collective initiatives, these charters are also representative of what the commons movement aims to achieve, especially when it comes to preserving the environment. We will now analyze them to see what commoning tactics could be identified in order to create a comprehensive guide of how to analyze commons, with a special focus on commoning in our case studies. There are different commoning activities depending on the particular objectives of the commons involved and the tasks needed to achieve those goals. Their assembly of commoning activities makes these charters tactical inasmuch as formulating these charters involves collective strategies to make the commons work. The charters are also meant to convince authoritative bodies that collective actions in pursuit of commons are legitimate and should be supported. I interpreted these charters as summaries of commoning activities to create and maintain the commons for the long term. These charters are then proof of commoning activities that worked in rendering the commons a legitimate long-term resource for specific areas of the city. I have grouped the commoning activities into specific categories to identify how different charters have addressed them.

3.3.2.1 Commoning Activity #1: Getting the Community Involved

The first category of commoning practices I analyzed was how commoners congregated as one community. It struck me as important to look at how commoners were able to gather otherwise isolated citizens and reach out to them through tactics of community development. There were a number of methods for community outreach laid out in the various charters worthy of discussion.

In the charter of the Association Ecoquartier, one of the key ways to build a community from scratch and implicate its members in the decision-making process with regard to development of the eco-neighborhood was by formalizing their engagement in a sort of contractual way which

involves having them co-produce relevant documents and then having them sign those. The documents would define the involvement of different stakeholders in collective and associative projects that would take place in their neighborhood. Stakeholders included investors for development, users, and residents, with their signatures expressing their commitment. The charter clearly states that stakeholders must "…contribute to and ensure the establishment of specific framework documents for three distinct levels of commitment of eco-district actors: district charter with a predefined part to be signed by all project developers (condition for the admissibility of applications) and a part to be built in a second phase in consultation between investors, residents and users of the district." The aim of implicating the users in project development was to give residents a major role of co-decision shared with investors, to make sure that the spaces created were most usable for them.

Some commons may develop a community by hosting educational events that entice people into activities associated with commoning. Education programs not only provide necessary social services for families standing to gain from being better informed, but also may encourage these families to support and participate in the commons. Since spreading information and educating communities is so inherent to the modus operandi of the commons, commoning tactics involving hosting educational programs are often seen as essential. Some charters show how much they can get involved with communities through education. For example, FONJEP claims in its preamble that its existence is based on "origins in youth and popular education and has since expanded to other fields of intervention." Since this is after all an association devoted to popular education, such a stance is not exactly a surprise.

But even commons not explicitly organized around education offer educational programs to their community. TERA, for example, organizes events based on the sharing of knowledge and education, which are open to anyone in the community. Its charter states that "learning at TERA is free, caring, happy and alive. Based on cooperation and the discovery of life, it is done at all ages and at all times thanks to the sharing of experiences and knowledge." This demonstrates how TERA is a collaborative space for training, hosting conferences, and accompanying workshops for groups or personal projects in different fields. Commons Josaphat also proposes a similar education curriculum for its surrounding communities. Its charter states that progress of the

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commons derives from "experimenting with collective structures to face tomorrow's urban challenges together… Creating social and solidarity links, education, super-diversity, these challenges find elements of solution more easily at the scale of relatively small collectives, built from the experiences and needs of the citizens themselves" (p. 30). From this quote, it is clear that Commons Josaphat wants to provide education to its commoners from the bottom up. It claims that through the dissemination of knowledge, solutions can be found by people who learn from each other and their local challenges. Other commons may share this knowledge by hosting larger-scale events like festivals or parties within the commons ground. For example, Murs à Pêches present their charter in the context of a festival hosted in its grounds. This festival is used to disseminate information and get support from people well outside the nearby community. Nonetheless, these events allow the commons to be broadcasted to a much larger base. And they gain support by spreading awareness and knowledge of their tactics. Such a support mechanism allows this commons space to survive against the threat of private development.

While it is important to get people involved from the outside, communities must continue to show support for the commons, and that can be further enhanced by commoning tactics that take place internally within the commons. The FONJEP Association uses tactics of involving the community by engaging with each school on how to best come up with guidelines for popular education co-constructed by commoners. Before meetings with the board of directors take place, the FONJEP Association makes sure that stakeholders, including the parents of children, are on the same page about how activities will take place during school hours. The FONJEP charter states that "each school organizes a consultation with its members prior to the meetings of the Board of Directors, in order to determine a common position. This working method facilitates the sharing of representations and co-construction during Board meetings" (p.4). Such consultation allows for the community to be more closely knit together and thereby strive for common objectives that the association was aiming to develop as school programs get set up.

The TERA charter specifies other tactics of assembling a community, such as arranging reunions among its members to discuss how to use collaborative tools for commoning. The charter, in a section called "Organization", claims that "collaborative meetings and tools promote consultation, information flow and cooperation" among members of the cooperative. Meetings enable members

to gather information and use it for collective engagement and decision making. In addition to gathering information, these forms of communication also facilitate dialogue amongst commoners which is what brings the community together around the commons.

Commoners also get communities involved in their commoning processes by hosting townhall meetings within their commons. Such townhall meetings prioritize getting the stakeholders in the community together to discuss and agree upon possible governance schemes that work for specific objectives. For example, the Shakirail hosts townhall meetings every week to assure the terms of usage of its communal spaces. Its charter specifies that "…the collective meets every week in one of the places managed by the association: to present oneself and participate in these meetings facilitates meeting the coordinators, who guarantee the good use and functioning of the various spaces, and having visibility across the whole range of events." Such regular meetings are essential for the collective governance scheme of artists who share the space and display their arts and talents in a way that is conducive to the objectives of the collective, a clear example of a commoning tactic used to bolster the governance of the commons.

The Bologna Regulation for the Care and Regeneration of Urban Commons provides for townhall meetings with the municipal councils to assure coordination across all sectors. The stakeholders involved in this new constitution use these meetings to come up with methods of incorporating the ambitions of residents into the management of the city as whole. Such townhall meetings are essential for creating a city as a commons and are therefore constituted as one of Bologna's main tactics for commoning. Under the section of "Etant Donnée" (or "Given"), its charter states that they are implementing "an Agenda to invite the Mayor and the Council to ensure cross-sectoral coordination on the part of the Executive for the launch and monitoring of the correct implementation of the Regulation concerning the collaboration between citizens and administration for the care and regeneration of urban common goods" (p. 2). The case study of Bologna shows how implementation of commons may be possible at a city-wide level.

Other urban commons, such as Falkirk, Commons Josaphat, and FONJEP, host similar kinds of meetings to agree upon usages of the space that allow their commons to be sustainable. For example, FONJEP's charter highlights meetings when stating that its forms of commoning "take

the form of meetings, dialogues and the implementation of projects to achieve common goals" (p. 2). In its section on "co-governance" the charter insists that members of FONJEP have the duty to work with all the stakeholders, whether associative leaders, FONJEP job holders, or public beneficiaries of the actions. This tactic is used to ensure that everyone is involved with creating a governance for the cohort of schools who are also members of FONJEP. The Falkirk community charter states the exact same thing under its "Assets" section on page 3, as does the Josaphat en Commun charter in its "Principles of Development" section on page 29. Townhall meetings allow the communities to engage in dialogue and their members to get to know one another better. Better understanding among members of a community makes it easier for collective governance schemes to be made successful in the long run, and these townhall meetings are the facilitators of such community-based strengthening.

Internal dialogue is essential to understand where participants stand on a variety of issues. It also is what allows the governance of the commons to move forward, adapt to new challenges, and seek new innovative solutions the fit the needs of many commoners. The FONJEP charter states that the modus operandi of the association is based on "having meetings, dialogues and the implementation of projects to achieve common goals" (p. 2). The Falkirk Community Charter mentions that dialogue, in which all stakeholders are given equal voice, facilitates a wise collective assessment if the commons were faced with specific challenges. Commons Josaphat regards internal dialogue as crucial to preserving commons for future generations. In the section "Innovative Residents of the Josaphat" its charter states that "…projects put future residents in dialogue with neighbors about the future of the neighborhood" (p. 23). This allows the commons to be usable for the long term, serving many generations who may face new challenges in their neighborhoods. It is clear that internal dialogue is a resilient way to advance an appropriate collective governance scheme for the commons, and that commons will often need to engage communities in these conversations as much as possible.

Along with engaging in dialogue, commoners also typically bestow some level of leadership to members who invest or participate the most in the commons. For any commons-based project, there is some hierarchical set-up which allows key members of the project to assume a higher level of responsibility. Such leadership is vital for effective collective governance. A few commons

engage in some form of commoning to encourage that kind of leadership. For example, the charter of Association Ecoquartier, in the section "Values and Founders of Governance" clarifies that there is a project leader who adheres to the ambitions of the eco-district charter (p. 16). The project leader will allow collective self-building in certain lots, as ascertained in the charter's "Land Policy" section (p. 25). But there must be some level of supervision to ensure that the self-building initiatives fit within the confines of the space. This again portrays some form of hierarchical leadership on how collective projects are implemented within the commons, confirming the need for leadership facilitation to ensure the functioning of collective governance schemes.

Charters also show that commoners pursue community outreach through social media. Social media platforms are essentially outlets for urban commons to promote and share their tactics and objectives. They are an effective way to attract others to join their community. Charters mentioning outreach by social media include that of Hotel du Nord's H2H Cooperative. Its section "Residents, Producers, Partners, and Clients" mentions that it uses and edits social media content to "promote the development of scientists, architects, academics, publishers, journalists, tourist offices and public institutions involved in this alternative common-based form of tourism in its neighborhood" (p.2). The charter also shows that H2H wants to establish direct relationships with different types of local players. Its section "Communication and Networking" states that it "intends to reach numerous social and professional networks in order to optimize the natural referencing capacities of its internet exchange place, which will be equipped with all the tools necessary for a networked communication strategy, such as blogging, social networking, service platforming, and interactivity with other websites." This clearly illustrates the potential social media have for commoners to turn network outreach into an effective commoning tactic.

Outreach through social media also enriches the initiatives within the commons. Support and participation are key factors in this process. The H2H Coop, for example, involves a wide range of users to operate as a commons entity, especially when it comes to hospitality. Its charter describes offers of hospitality through an enlarged networking scheme, stating "It consists in developing a "hospitality offer" based on the networking and strengthening of hospitality initiatives developed by the inhabitants in the interest of those who live, work and stay in the neighborhood" (p. 2). The importance of network establishment is highlighted when stating that

the coop's modus operandi depends on "…a networking of offers that optimizes their referencing capacities and the publication of systematically tagged and geolocalized content to increase their accessibility." It is obvious that such online networking strengthens its commons initiative.

Such networks are also designed to give commons a link to economic resources by facilitating their attachment to the circular economy and/or that part of the Social and Solidarity Economy which French social scientists refer to as "économie plurielle" (Laville 2003). For example, Commons Josaphat has all the ambitions to create a network based on a circular economy. Its charter states that its "district remains open to the world and will continue to be inserted into economic networks that go beyond it, with neighboring districts, with various forms of employment pools, with the Region, with Belgium and beyond." Commons that are somehow affiliated with the circular economy certainly provide a lot to communities, while at the same time setting themselves up for greater economic success in the future. Commons Josaphat also builds a circular economy through recycling, stating that "alternatives to the use of cheap but polluting and energy-intensive new materials are encouraged. This may include, for example, the use of renewable resources, local materials, or reuse-material channels." Such emphasis on sustainable development and recycling of certain materials allows commoners to use local resources of the communities' bio-region for development and resource production.

Association Ecoquartier also affiliates itself with a circular economy, stating that a network of circulation is a key aspect in developing these new forms of economies. Such a network of circulation allows crops to be grown by residents and distributed in fair ways to other members of the community. Food produce from local sources is a key aspect of how circular economies may look like in cities. According to these charters, the commons have the means and ambitions to fulfill that goal. Social media facilitation may also help enriching that process, as shown in the abovementioned charters.

 While social media facilitation is a key method to gather a community together, these commons must be spaces where people can voice their concerns and difficulties. These spaces therefore become political outlets for marginalized groups, and several charters represent these political outlets as safe spaces for people to exercise their rights. Often enough, commons are already

engaged in a political battle to democratize certain access to resources, and the charters often confirm the commons' position in these political battles. For example, Association EcoQuartier, notes in its section "Values, Founders, and Governance" that "it is in this way that the initially 'passive' governance of the Neighborhood Charter will have a chance to evolve into 'active' governance where the appropriation, everybody's participation and long-term commitment (the greatest challenge!) help create the kind of urbanist, sociologist, or political scientist needed for the kind of society we envision". (p. 16) This kind of active governance associated with the implementation of commons, grounded in collective ownership, participation and commitment by all members, can transform how we do city planning in the future. The transformation of governance from a "passive" one into an "active one is intended to turn commons into spaces of political liberation. Such a set up allows commoners to exercise a right to self-determination in building certain urban spaces for the greater benefit of the public. Just having city dwellers exercise this right enables commons to become political hubs against the top-down approach of urban planning, where urban dwellers are not afforded such rights of common spaces.

Commons Josaphat is also considered to be a hub of political activism. Its charter, in the section "Whom Do We Build For" explicitly states that "housing is a right, not a commodity. The Josaphat site makes this political choice a reality. Today, only social housing is permanently exempted from a market logic" (p. 21). Clearly, Commons Josaphat is being implemented by its commoners as part of a broader struggle for affordable housing which marginalized groups face when trying to determine where they will find shelter. Commons Josaphat endows the activism of its commoners with a functional and political dimension, joining the challenge of perfecting our democratic structures. This is a good illustration of how charters can be written to crystallize commons as spaces of political activism.

3.3.2.2 Commoning Activity #2: Commons as Physical and Social Spaces

The second category of commoning tactics involves assessing the physical features of a commons and how those shape its integration within a neighborhood. Charters often unveil the physical planning of a commons space by assessing its defining physical and environmental features, including the locations of its boundaries. Assessing the physical aspects of a commons is crucial

to understand how it fits into the neighborhood. And those physical characteristics often enough also imply a certain limit to what that commons can provide for the residents in that neighborhood. Especially when urban commons involve vacant or underutilized structures in a city, this aspect of chartering practices becomes crucial in developing commons. When it comes to occupying spaces, several charters specify what tactics were used to make such a space occupation legally possible.

For example, in the section "Principles of Development" of Commons Josaphat's charter one of the key activities conceived during the commoning process is the action of occupying abandoned spaces. It is stated there that, "Clearing the city beginning with public spaces: the occupation of a space to be redeveloped by residents, civil society, and artists, allows for the emergence of an awareness of place and the initiation of practices. In addition to increasing the availability of land for the city's creativity, these occupations bring to light challenges whose magnitude had not been anticipated" (p. 30). Commons Josaphat therefore claims that by occupying neglected spaces, commoners and cities can solve specific socio-economic and environmental issues associated with urban planning, and that such a process deserves to be put in the spotlight when reconsidering how urban planning may work in the future. But to achieve that, as its charter makes clear, boundaries must be clearly defined.

Commons Josaphat also states that such occupation activity must take into account the conditions and limitations of that space. The occupation must be approved not only by residents, but also by project leaders and municipalities. Commoners in Commons Josaphat can observe access points, boundaries, and the physical conditions of a space through the creation of temporary access to the wasteland. Commoners should then observe the paths that the public "naturally" takes to cross the wasteland, as mentioned on page 24 of its charter under the section "Everything Starts with Public Space." Such a process of ex-ante evaluation is a key tactic to see how commons can be made to fit with the physical attributes of a common space. In the section "Pluralist Economy" (i.e. "Économie Plurielle"), the charter states that such occupations must "create favorable conditions for user ownership. Land use planning has a determining influence on the type of businesses that can develop in a territory. Commons Josaphat will present favorable conditions for the installation of a circular and cooperative economy while leaving room for organic creation and co-creation" (p. 51). Commons Josaphat is thus tasked with assuring such favorable conditions before

incorporating their commons, but this requires identifying conditions that make such a set-up possible. We can attribute these actions and statements found in the charter to a process in which commoners assess the physical attributes of a space where the commons may be erected.

Determining the physical attributes of a space may also require some level of collective mapping by members of a commons. As a matter of fact, both physical and digital mapping are widely used tactics of commoning when setting up commons. We can find several references to collective mapping by looking at the charters. For example, the charter of the Bologna Regulation for the Care and Regeneration of Urban Commons, under "Title 7: Communication, Transparency, and Evaluation," claims that stakeholders involved in the commoning process in Bologna often "map subjects and interventions of care and regeneration of the commons in order to help active citizens identify sites for intervention" (p. 24). In other examples, commoners will use software like OpenStreetMap or Map-IT to do collective mapping schemes of a neighborhood or commons, as evidenced on the websites for Murs à Pêches and Bassin Versant Solidaire de Forest (both case studies I discuss in much greater detail in chapter 4).

The Charter for Building a Data Commons for a Free, Fair, and Sustainable Future (https://commons.blog/2017/04/04/charter-for-building-a-data-commons-for-a-free-fair-and-sustainable-future/) offers guidelines for data commons governance and "provides practical guidance and political orientation for mapping, modeling, managing and sharing data as a Commons." This global data commons encourages commoners to map their community and manage data differently than people who centralize data control for profit. In this example mapping is a commoning tactic for a political alternative to the capitalist logic of for-profit data management whose problematic nature crystallizes around the relentless drive for domination by Amazon, Facebook, Google or China's internet giants.

Mapping can also be used as a social tool to determine the cultural aspects of a neighborhood. For example, the commoners of the Bassin Versant Solidaire de Forest in Brussels use the Map-It tool as a way to create a master plan of small interventions that together give a different image to the neighborhood (see section 4.1.5 for more details). We can consider this a form of mental mapping in preparation of the commons. Such mapping techniques allow commons to fit better the

personality or profile of the neighborhood. According to the Falkirk Community Charter, "commoners consider the final details and inclusion of characteristics of the neighborhood that are found well beyond the geographical boundaries of their council area, but that were still a major part of the area's cultural heritage" (p. 3). Those characteristics were considered in the mapping phases of commoning. Association Ecoquartier has proposed a very similar form of understanding the neighborhood in its charter. As its members have set up their commons, "they envision the users of the commons as a representation of the neighborhood in a much more humane way" (p. 4). Creating a link between the people and their surroundings is a form of mapping that allows the commons collective to work for the neighborhood.

Assessing how the commons will interplay with the characteristics of the neighborhood is a key commoning activity, because a commons ultimately becomes one of the many representations that make a neighborhood unique. Such a tactic can also help commoners understand better what the commons can be used for. For the case of TERA, its modes of operation are determined by creating an "economy of functionality within the neighborhood, which is based on the performance of use and territorial production" (p. 3). These commoning tactics are key in ensuring that the commons is an integral part of the neighborhoods' dynamic. In some cases, the commons may incorporate a piece of the neighborhood's history to fit better into the territory. This enriches the history of the neighborhood while also determining how the commons can become a cultural hub for a neighborhood's residents. Such commoning activity is highlighted in the pact of Murs à Pêches, which states that, "This space is also the identity of the city and a tangible sign of its history. It is therefore an essential element for the Montreuillois" (see section 4.3.3). This illustrates well how much commons can have an impact in uplifting the history and shaping the identity of a neighborhood.

As social spaces giving communities cohesion commons can be crucial vectors of cultural awareness. For example, the Falkirk Community Charter states in its opening section entitled "Declaration" that this document "pertains to any development within our territory which impacts on our Cultural Heritage and, as this Charter is a direct expression from the people, it must be a material consideration in planning processes and decision-making" (p. 1). Basically, this charter is committing the communities in its territory to a process of collective decision-making bound to

respect and enrich the cultural heritage of the area. This is a method used to link the commons objective with the history and culture of the area. The H2H charter mentions a similar passage of cultural awareness by stating that its operations must "link the need to be able to recognize itself in one or more heritage elements to the right for all. It must also be constitutive of the Universal Declaration of Human Rights, to participate in the cultural life of one's territory, in the definition and conservation of one's heritage." This ensures commoners that they have an active duty to respect and resurrect the local culture of the area in whatever development the commons undergoes. Murs à Pêches mentions similarly in its pact that the site "can be transformed into a great common and shared space, a reservoir of biodiversity in the city to ensure access to nature, culture and recreation for the inhabitants," thereby guiding its commoners towards deciding what objective a commons has in a specific local context.

When looking at their objectives, commons typically respond to neighborhood problems which may be ecological in nature or of a social kind. Several charters of urban commons we have looked at refer to the ecological crisis we face today. Take the TERA charter, for example, which states that the cooperative places "respect for nature and life at the heart of its decisions. The association plans to limit all forms of pollution, guarantee the maintenance and renewal of the natural resources it consumes, produce only a minimal amount of waste and consider them as potential resources as much as possible" (p. 2). The R-Urban charter (see also section 4.2.1) states that it incorporates the "concept and practice of environmental management aimed at limiting the impacts of industry on the environment" (p. 2). The pact of Murs à Pêches (see section 4.3) states that its commons "now needs to join forces and think of a global general interest project for this site that can structure the ecological transition of Montreuil." The Falkirk Community Charter reasserts the recognition by Scottish Natural Heritage, Scotland's Nature Agency (https://www.nature.scot) that "Nature is essential for human life which we are not separate from, and that mental well-being is greater when natural surroundings and beautiful landscapes can be experienced." There is a clear emphasis on the importance of the preservation of nature from which derives a widely shared focus on identifying ecological problems in an urban context and finding solutions to those problems.

The same applies to urban communities utilizing commons to address social problems. A good example for the purposes of illustrating how urban commons can have that social focus is the so-

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called "Co-Bologna Program" (http://co-bologna.it/wp-content/uploads/sites/8/2015/11/CO-BOLOGNA.pdf), which refers to the collaboration pact between the city of Bologna and the Fondazione del Monte di Bologna e Ravenna as an outgrowth of the aforementioned Bologna Regulation for the Care and Regeneration of Urban Commons, states that the parties involved in the pact must work together "to create a hub for designing of intersectoral local public policies and to transform Bologna in a truly collaborative city enabling and facilitating participation of non-public local actors; the main goal is to support people needs and ideas, stimulating a variety of urban commons projects to reach a social, economic, and territorial well-being" (p. 4).

3.3.2.3 Commoning Activity #3: Collective Action Among Stakeholders and Democracy

Apart from getting the community involved and contextualizing commons in terms of the ecological and/or social problems they are committed to address, commoners also have to determine who will participate on a regular basis and who will assume which responsibilities, while coming up with a democratic approach to make these collective decisions. These are the commoning tactics used once the community is involved within the commons. When committing to collective action, stakeholders can lay out who is responsible for certain aspects of the commons. The Falkirk Community Charter, for example, stipulates what roles stakeholders have when undertaking participatory planning of certain commons-based projects in the area of Falkirk. On page 3, under the section "Rights and Responsibilities," the charter specifies that "We have a basic responsibility towards improving and safeguarding the Assets in our territory insofar as our rights under article 1 are not infringed. Article 3: Principles for Participatory Planning (1) In fulfilling our responsibility under article 2 in relation to an application for development made within our territory." It is clear from this charter that commoners around the Falkirk communities have dedicated rights and responsibilities for participation.

The Commons Josaphat charter also lays out some basic principles of how commoners should engage in occupying certain spaces by categorizing which type of action should be undertaken depending on the situation. In page 14, under the category of "Governance", the charter specifies "That first phase of occupation distinguishes at a minimum between a kind of event that can be spontaneous, one that requires debate, and finally one that requires formal authorization from the

owner, as the legal owner of the wasteland." This sort of categorization ensures that commoners occupy spaces in a responsible and legal manner by presenting how they might approach the action of occupation. The Commons Josaphat also lays out a set of responsibilities for residents near its commons. Its charter dictates the spaces residents can manage on their own by stating that "some parts such as parks and roads in the neighborhood will be entirely managed and maintained by the residents and users of the immediate vicinity of the street, square, park or garden. The final responsibility is the structure that owns the land." This part of the charter clarifies what residents can do with certain spaces and who has ultimate responsibility for them.

Tactics of collective action also help commoners develop groups of participants to gain control over specific tasks that enrich common development. For example, the charter of Commons Josaphat states in its section "Innovative Housing at Commons Josaphat" that "groups of clustered residents can be developers themselves" (p. 23). This gives residents specific rights to maintain and use the commons without outside interruption. Similarly, Hotel du Nord's H2H cooperative states in its section "From Local to International" that "by carrying the spirit of the promoted brand, H2H hosts will become members of the same cooperative society, co-managers in their own right of their common promotion and marketing tool. By assuming the function of local hospitality group, they will ensure the quality of the offers, the welcoming of the guests, and their participation in the democratic life of the cooperative" (p.2). This sort of group creation and distribution of rights is essential for the integrity of a collective governance scheme. But such division of rights can be differentiated in a pluralist manner. The charter of TERA highlights this point by stating in its section "Training and Education" that "Tera is a space for training, hosting conferences, support workshops for groups, or personal projects in different fields (economy, ecology, non-violent communication, renewable energies, new technologies...)" (p. 3). We can see here clearly that collective action can bring about a whole host of rights pertaining to the shared interest of a community when co-creating commons through such tactics of commoning. This process also forges rules that are co-created by the commoners themselves. For example, the TERA charter states on the same page 3 that commons-based initiatives must co-construct their project with stakeholders across the entire territory the commons is located in.

Collective action also helps commoners develop a democratic approach to how they make decisions for the commons to ensure that all participating voices are heard. That principle of collaborative democracy extends to writing their charters One can also understand how these charters are written collaboratively and democratically, as everyone has the right to share their thoughts and decide on what the principles of the commons should be. This is something explicitly invoked in the Falkirk Community Charter. Its opening section entitled "Declaration" states that, "this charter is a direct expression from the people, it must be a material consideration in planning processes and decision-making" (p. 1). Such a democratic approach is absolutely necessary to ensure that collective governance schemes work for commons. Writing a charter with everyone participating in the decision-making concerning guidelines and principles is part of the commoning processes that make commons inherently democratic.

Collective-action tactics also apply when confronting challenges and addressing conflict that may arise internally. As commons represent a collective engagement, it is important that each participating individual has an equal right to voice concerns or opinions despite differences. The Falkirk Community Charter states this explicitly. Its opening "Declaration" notes that "members of the charter acknowledge that individual opinions may differ on such matters but believe that, through a dialogue in which all stakeholders are given equal voice, a wise collective assessment can be reached" (p. 1). Conflict resolution is a key part of any commons, and charters will reflect that reality as a key element of collective governance schemes. For example, the TERA charter writes on page 4 that the commons organization welcomes the "conflicts that arise, accompany them and celebrate the restoration of relationships." Conflicts may prompt commoners to form an intergenerational group bridging differences together. Commons Josaphat talks about how occupied spaces are perfect grounds for facing conflict between different groups of people. Its charter notes in the section "The Public Space as a Common Good" that "To enhance the symbolic meaning of public space: The public space must once again become a real space for debate and open manifestation of conflict. Public space is a space for communication, between people, but also through urban planning" (p. 29). This implies that commons should be designed and co-created with conflicts in mind, because those are in the end inevitable. Yet they should be understood as progressive, because finding common ground on a host of issues allows the commoners to move forward and avoid potential conflict in the future. Commoning tactics should

include measures to deal with conflicts in a democratic way and ensure that leaders who confront these conflicts are able to listen to everyone without any bias.

3.3.2.4 Commoning Activity #4. Achieving Permanency

One of the key goals of commoning is to ensure that the commons are there to stay over the long haul. The initial set-up phases of creation are often decisive in allowing commons to reach a certain level of maturity and durability, but additional commoning tactics aimed at longevity are of crucial importance as well. Permanency can be more easily achieved by engaging in dialogue with supporting authoritative bodies. Municipalities can be very helpful in making the commons settle down in urban areas and facilitate their continued development by giving grants, providing long-term leases, and offering legal protection against private developers. Their support is invaluable. It is thus conceivable that every urban commons should do its best to gain the support of the public authorities, and the best method to draw local officials into a productive dialogue leading to such support is by presenting an official charter of the commons.

Some of these commons introduce charters as official documents designed for governments to approve their projects. In some of these charters commoners call explicitly for government support as a means of negotiating a lease or financial contract which would assure the project's longevity in the area. Take, for example, the charter of Commons Josaphat. Once again in its section "The Public Space as a Common Good" the charter states that "these initiatives must be supported by the public authorities and by the collective neighborhood structures in legal, financial and infrastructural terms. Sustainable Neighborhood Contracts are good examples of how to allocate resources in consultation with the users" (p. 30). This quote illustrates well how charters can be jurisdictional documents, in this case calling on municipalities to give contracts of "sustainability" to help the neighborhood. The Murs à Pêches collective has a similar provision in its pact. They call on the municipality of Montreuil to elect candidates that support their initiative of preserving their commons, stating "that is why we invite the candidates for the municipal elections in Montreuil to take a position and defend the five measures of the Pacte pour l'Avenir des Murs à Pêches proposed by the Fédération des Murs à Pêches. We await their responses and will publish them by March 1, 2020" (p. 1). This is again another example of how charters are an official

request to engage in dialogue with governing bodies to support commons initiatives. This particular case is interesting, not least because the document is proposed during the municipal elections of Montreuil. And the commoners state that they will support the candidate that defends their cause. This case makes the charter an example of how commons can become politically engaged and eventually affect the outcome of local elections. We can in that sense interpret commons also as political projects expressing needs and preferences of voters.

Some other commons use charters to demonstrate to the municipality how formally organized their governance is. This is another way to gain support from municipalities. If local authorities can see how the organization works and fits into the local context of the neighborhood, they will be more inclined to support it legally and financially. This is the case with the TERA charter, for example. In its opening "The Organization" section, right on the first page, it says "The formalization concerns the regulatory aspects and the fundamental principles of the association, while other structures or operating rules are developed and evolve as needed." Sometimes charters are presented with the idea that commoners must show their nodes of collective governance to prove to authoritative bodies that it works well and does not cause any problems within the neighborhood. The TERA charter, as this quoted passage implies, appeals to this kind of recognition while preserving the flexibility it will need for its evolution going forward.

The Falkirk Community Charter requests government to respect the rights of its commoners to protect the region's assets and preserve those also for future generations to come. In other words, the charter is used to communicate to governments that they must assume such rights belong to citizens, and that they have a formal duty to protect their rights as a commons. In the section of "Rights and Responsibilities" it is stated that "this Charter declares a basic right for the peoples of a community to have agency over those Assets in its territory it has agreed are integral to human and environmental health and well-being, for both present and future generations" (p.5). Defending the rights of citizens, clearly the aim of Falkirk's Community Charter, requires the government to assure that these rights are protected. As stated in Ostrom's design principles, commons are more likely to function in the long term if they have a state-led entity as facilitator. Charters propose for state institutions to become such facilitators, and they must be analyzed as a measure taken by commoners to engage in this support-seeking process with the government.

Some commons use charters to summarize the rules and principles which the community has collectively decided on. These summaries are reminders for commoners of the rules they have to follow if they want to continue being a part of the commons. They are also a reminder that each commoner has a bundle of rights that they can exercise in order to achieve a collective goal. While charters are often used as legal documents to get support from the public authorities, they can thus also serve as internal rule-regulator or rights provider. In that regard, the process of writing the charter itself becomes an important act of commoning activity, explicating what the commons to be created is all about. Let us take the Association Ecoquartier as an example for illustration. The association's members decide after some discussion that it would be a good idea to lay out the specific rights and responsibilities of each group involved in the project explicitly in a charter for which they set up an editorial committee to publish their collectively elaborated rules and norms.

In its section "Let's Participate!" their charter specifies that "after having decided to publish the results of this approach, chosen delegates of each group formed the drafting committee of this brochure" (p. 10). Later on, in its section "Housing Policy," the charter exhorts its members "to use the building lease as much as possible for the public interest" (p. 20). Such a call validates the charter as a document of good practice in order to fit the needs of the local neighborhood. Similarly, Commons Josaphat insists that its charter should be "read as a procedural proposal for the elaboration of a neighborhood as a common good and as the basis of a charter for the realization of such a neighborhood" (p. 9). In this case the charter is a proposition for good neighborhood stewardship, implying that following the charter's rules will help increase the well-being of the neighborhood. These charters are ultimately effective tools to get the commons project up and running from scratch, and they serve as a vital step in building an effective collective governance scheme. They also help commoners obtain appropriate legal status from public authorities to build and maintain their commons for the long-term.

These charters help commons achieve permanency, inasmuch as they strongly promote co-production, self-sufficiency, and nurtured connections as well as networks all of which contribute to the longevity of the commons in a given neighborhood. Co-production is a frequent topic found in those charters. It is what enables the commoners to work together to produce and maintain their

commons. The TERA charter reflects precisely that when it says in page 3 that the development of its commons depends on its commoners to "co-construct the project with all relevant stakeholders in the territory." In the section entitled "Commitments of the State, Local Authorities and Associations in the Co-Management" FONJEP's charter notes that its commons aims "to be a force in bringing forward proposals for projects and experiments to be co-constructed between the State, the local authorities and the associations" (p. 4). The development of the commons thus explicitly includes local authorities in the co-construction process.

While commons focus for obvious reasons on their relationships with local authorities, they also must maintain a level of self-sufficiency that allows them to operate independently. The charter of Association Ecoquartier notes, for instance, that their commons have "functioned over time, autonomously, in close collaboration with each other" (p. 1). Subsequently the same charter states that for their commons to function best "...setting aside spaces of freedom is hence an essential process: whether protected land or zoned lots to be invested in by residents and/or nature; calls for projects; minimal regulation dealing with the process (interdisciplinarity, partnerships) more than building codes; self-construction management" (p. 14). This is a clear indication that, while the association welcomes support from the state, its commons can only grow if their collective governance is autonomous. As a result, self-sufficiency becomes a key determinant of success. In the same vein the TERA Charter highlights the importance of "self-governance and absence of hierarchical relations within an identified decision-making circle, compatible with the designation of referents for certain missions" (p. 1). TERA therefore evokes the same need of self-sufficiency as Association Ecoquartier, a recurring theme in these charters.

Commons also require partners with whom to nurture connections. The H2H charter states in its section "For a Communication in Networks" that "by establishing direct relationships with different types of local actors, H2H intends to reach many social and professional networks in order to optimize the 'natural' referencing capacities of its internet exchange place, which will be equipped with all the necessary tools for a networked communication strategy" (p. 2). Commons must link up with other networks in order to thrive. The Falkirk Community Charters stipulates similar principles in its section "Our Assets," as pertains to nurturing connections. On page 2 it notes "the resilience and continuity of our community: our local groups, events, businesses and

services; our friendly interrelationships and economic interdependencies; and our visions, values, history and culture, all of which when shared, bind us together and provide good traditions, solid foundations and shining examples for generations to come." The passage confirms that commons grow when a greater network is established around that commons, while at the same time also making neighborhoods more resilient to pressures overall.

The TERA charter goes in the same direction in its section "Relations" where it specifies on page 1 that "Terians aspire to: engage in caring, peaceful and authentic relationships, develop non-violent communication among themselves, welcome conflicts that arise, accompany them and celebrate the restoration of relationships, constitute an intergenerational group." Again, the commons in this example is conceived more widely to include a set of exogenous relationships to maintain its integrity and functionality. In its section "Allowing Residents to be Actors of Space and Public Facilities" the charter of Association Ecoquartier notes that "It is essential to respond to these aspirations and put participatory and associative approaches at the heart of the design and life of the ecoquartier, levers that can foster new sociability, new neighborhood relationships and, why not, new responsibilities" (p. 16). The theme of nurturing connections appears to be an essential part of the commoning process, recognizing the undeniable reality that more support leads to greater sustainability of the commons. The various charters propose quite consistently that the commons go farther than the internal collective governance scheme itself and extend to create new relationships within the neighborhood. According to these charters, gaining partners is a key factor in commoning.

3.3.3 Additional Insights into the "Tactical Chartering Manifesto"

When we first analyzed various charters on the *Remix the Commons* platform, their documentation allowed me to draw upon several consistent findings in what commoners use as tools and tactics for their commons. These consistent findings then became principles that I would take note of for further research. By observing these principles in the charters, the *Remix* team decided that it might be a good idea to create a document summarizing these tactics so that they could be used in the general development of the commons. As a result, I have been working, together with Frederic

Sultan, on a manifesto describing the principles of these commoning tactics, which is available on the *Remix the Commons* platform (https://wiki.remixthecommons.org/index.php/Tactical_Chartering_Manifesto). Our hope is that, by creating a manifesto based on the principles of commoning, we can help scale up the commons to a level where they may have a major impact on urban planning and development.

This Tactical Chartering Manifesto (TCM), which I have reprinted in the Annex of this thesis, is a document written to highlight several key mechanisms used by commoners to write charters and to render their commons relevant, functional, and sustainable within their specific local urban environment. The aim is for people to interpret this document from a diversity of perspectives so that its content may be applicable to an array of different urban contexts. Looking at specific charters from a variety of different commons, we can observe what patterns are detectable within each document or charter and how these patterns correspond to the general governance and construction of urban commons. As we document certain charters and other documents related to commons initiatives, we ask ourselves what urban residents use as legal tools or as enablers of communication and co-production to forge a movement, respond to an urban dilemma, protect rights of use of certain urban resources, or create spaces of collaboration and co-production from which urban residents can directly benefit. Our case studies have not only revealed common themes and concepts that might be used to link certain commons projects together, but also shared tactics and mechanisms that are highlighted by charters in specific contexts. We want to highlight these mechanisms as forms of chartering practices, as a resource for users to establish their proper commons projects. We also can observe several ways in which commoners use legal/jurisdictional tools to get the government involved adequately. In the end, our goal is to allow commoners around the world to use the TCM as a tool to enable their commons projects. Our work may also help establish networks of peers to co-produce and create several forms of collective communication for building movements that are impactful in urban contexts/politics. That is why we have kept the manifesto open and modifiable by other commoners who share their own experiences and interpretations of 'tactical chartering.'

Now that work on my doctoral thesis has given me an opportunity to revisit eleven charters from the "Atlas of Charters of Urban Commons" for a closer look by means of discourse analysis, I

have gained additional insights into what they share. If I were to redo the original Tactical Chartering Manifesto reprinted in the Annex of the thesis, I would raise several points as supplementary information to be injected into the TCM's relevant "tasks." Any such upgrade would aim for an improved understanding of what is "tactical" about charters in terms of strengthening their commons, I will briefly summarize here what I have come to appreciate from the thesis-related discourse analysis about chartering practices.

Let me start by highlighting the objectives of tactical chartering (TC) to give this crucial activity its proper due. TC aims to encourage cognitive resilience building, a mental process of human perception, memory, and reasoning that people acquire from interacting frequently with local ecosystems, shaping peoples' experience, world views, and values towards local ecosystems (Colding and Barthel 2013). TC also should help achieve permanency, especially when the process is designed to protect an urban space that is only temporary until the vacant lot it sits on is under construction. This process is based on collective action and effective local governance in developing a strong appearance or aesthetic that adds to the character of the neighborhood (Colding and Barthel 2013). Another goal, already highlighted early on by the protagonists of commons (Olson 1965), is to avoid free riding which occurs whenever members of a group deliberately provide less or participate less than is required of them to achieve a common goal. We want to use TC for strengthening open source urbanism as a cooperative model allowing active users to adapt and modify theories, research, and practices freely following the proven experiences and based upon specific needs and intuitions (Bradley 2015). TC can facilitate equitable participation, a process emphasizing broadly based activism of constituents to shape the direction and operation of political systems by advocating for more involved forms of citizen participation and greater political representation. In the same vein, TC will want to promote democracy by insisting on a pluralist approach in solidarity with the rest of the group where different voices are given equal weight and alternative modes of achieving widely shared objectives all have an opportunity for consideration. All of these objectives depend ultimately on collaboration whereby individuals work together in pursuit of shared goals.

The next step is to highlight the characteristics of a charter, pointing to the key features of chartering practices in support of a commons project. The charter needs to start with a clear

definition so that planning and/or maneuvering between otherwise unrelated groups can strive for a common purpose and small-scale actions can fit into a larger context. Successful launching of commons requires the creation of a community with workable governance structures. Writing a charter may be a useful stepping stone in such a process, as it mobilizes various stakeholders, gives each one a chance to voice their concerns with each other, brings in relevant organizations, makes sure these represent the interests of affected residents and activists, and gives the parties involved a chance to work out who does what in terms of roles and responsibilities (e.g. hosting panels or discussion meetings, communicating to the municipality, providing expert feedback). TC involves taking a deliberate phased approach to instigating change by making a plan, setting rules and norms, and providing responsibilities that make the writing of the charter more conducive to the people and physical space of the neighborhood. Since local residents know the most about what challenges their neighborhood faces, it is crucial to get them to share their thoughts and have them involved in setting norms or making decisions so that local challenges can be met by locally grounded ideas. TC should have realistic expectations about the scope of the project. It is typically better to have smaller-scale projects, which are more likely to lead to success and are less expensive, than large-scale transformative projects driven by excessive ambitions which risk to turn out unrealistic. Commons thrive on developing and nourishing social capital between residents, community leaders, private institutions, NGOs, and other constituents, and their charters can play a significant role in that process. Writing a charter forces clearer communication between the different groups involved and also depends on the trust they are building with each other. TC must look at the charter as a tool for encouraging participatory planning by a public involved in the testing of ideas and design features, often an essential prerequisite for urban projects to be successful. While all urban commons are local, their existence deserves to be propagated globally so that their ideas can be easily accessed, best done through sophisticated web-based tools for effective online sharing tactics, in other cities across the globe facing similar problems.

Once an idea for a commons has matured enough to mobilize sufficient numbers of people and organizations into action so that they can meet around a collectively elaborated agenda and even consider writing a charter, then chartering practices can begin as a mobilizing strategy built around a series of tasks. In our original TCM posted on the *Remix the Commons* platform (see the Annex), we identified ten such tasks, getting the community involved, assessing the physical aspect of the

space, assessing the social aspect of the space, finding stakeholders and making decisions, understanding the character of the neighborhood, understanding the qualities of the neighborhood, communication, coordinating with relevant government bodies, putting a label on the urban commons, and securing the longevity of urban commons. As illustrated in the manifesto itself, each of these tasks involves various concrete steps that can be taken alternatively, consecutively, or concomitantly.

Section 3.4 Perspectives on Urban Commons and their Commoning Practices

When looking at various charters written to define urban common projects and then extending that analysis to summarize what they share in common in a tactical chartering manifesto, as I did for the *Remix the Commons* platform and have further refined in this chapter, we can gain a lot of insights worth highlighting more explicitly. Those insights relate above all to the practices of people getting involved in commons, in other words the commoners and their commoning practices, the subjects. For them the challenge of having their commons effectively serve their neighborhoods is a multi-stage process. Activists of the global commons movement need to be clear-eyed about this. There are still far too few commons given their potential to address a series of social and/or ecological problems, and a fairly large number among those relatively few commons fail to gain permanency. Instead they eventually cease to exist, either because they die a slow death of gradual exhaustion for lack of committed activists or they end quite suddenly when rendered non-operative by capitalism's dominance (e.g. private developers taking over a hitherto public space containing the commons). Commoners need to prepare for the fragility of commons and make sure to secure their resilience instead.

But our discussion of tactical charters bears additional lessons, and these relate to the very nature of commons themselves as object of investigation. In section 3.3.2 we analyzed eleven charters in order to see how chartering practices generally contribute to the development of commons. In other words, all of those charters were used for general observations on commoning practices. Those eleven charters contain a variety of objectives beyond the subject of this thesis, including building immaterial commons, expanding ecological resilience, or creating vectors of educational commons. Of those eleven charters, three have ended up playing a much bigger role in my thesis

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because they respond directly to notion of ecological resilience in cities. Those three charters are presented in chapter 4 (i.e. Bassin Versant Solidaire de Forest in Bruxelles, as well as Agrocité in Gennevilliers and Murs à Pêches in Montreuil, both on the outskirts of Paris).

What has struck me about this selection is the amazing variety of different types of urban commons which these eleven charters represent. When you think a bit more about this variety, it becomes clear that the applicability of commons, in particular urban commons, requires to have an appropriately flexible and wide-ranging notion of the kinds of common-pool resources we can potentially turn into commons today, at the edge of the 21st century, in the face of climate change and other systemic problems the traditional mixed-economy capitalism has not been able to address well on its own, limited as it is prone to market failures as well as government failures. Commons, especially when reconceptualized broadly, can be justified not least as being able to overcome either type of failure and hence move the system beyond its current limitations.

3.4.1 The Building Blocks of Commoning

As we look back at some of the charters discussed in section 3.3.2, we can see that commoning is a vital step in setting up commons in any urban setting. Commoning incorporates all the steps necessary to constitute a resource as a commons, and it also includes all aspects of collective action that Ostrom incorporated in her definition of the commons. Scholars like Charlotte Hess (2008), Peter Linebaugh (2009), and Valérie Fournier (2013) have emphasized that the social processes taking place during the creation of commons and formation of their governance mechanisms are also of key importance to producing new resources. These social processes can be easily traced through the charters as they are typically summarized in those documents. But the charters take the process of commoning a step further.

Scholars like Christian Iaione (2010) have used commoning to show how commons get developed from scratch. As mentioned before (in section 2.1.2), he divides the steps of commoning into phases. His phases are limited to mapping, experimentation, and prototyping. These phases are obviously crucial to the extent that they lead commoners to engage in processes of collective action which create a unified community and implement governance mechanisms that work for their

commons. The mapping phase, for instance, allows commoners to configure their commons and plan the space in a certain way, while at the same time allowing everyone interested to interject and design their own plans for the space through a process of mental and physical mapping. The experimentation phase gives commoners an opportunity to try out their commons design and implementation in an interactive way. This phase tests the governance scheme that was collectively proposed. If a rule has been judged by a majority as not working well enough, this phase gives space for commoners to test and experiment with possibly better alternatives. In addition, the prototyping phase allows well-functioning commons to serve as models for future commons. All these phases have proven essential for commoners to assess a space under consideration before building a resource or structure and, if given the go-ahead, to put in place an operational collective governance structure.

Those three phases of Iaione (2010), even their modified version of six (i.e. cheap talking, mapping, practicing, prototyping, testing, and modeling) phases put forth in the "Co-Cities Project" of Foster and Iaione (2017), apply primarily to the kind of commoning activities needed to build commons from scratch. But we need to go beyond situations where the commons are only just getting set up. We need to have a longer-term vision and extend the social processes of commoning to commons meant to be sustained for a long-term future. A temporary commons is limited, and commons need to be permanent if they are to be an effective policy tool for cities fighting climate change. In fact, there is not yet much literature analyzing forms of commoning when the commons is already set up but is trying to achieve a long-term agenda for the neighborhood. Even analyses concerned with the conditions needed to make commons work (e.g. Bromley and Feeney 1992; Dietz, Ostrom and Stern 2003) worry more about the difficulties commons encounter over the long haul than elaborating what kind of conditions would help improve their odds of survival.

We thus need to take the definition of commoning beyond its current theoretical framework and extend it to situations where the commons are there to stay. In this context, it is more appropriate to speak of building blocks rather than phases, since they are all essential to the long-term survival of commons and, once the commons is established, do not necessarily follow a particular order. By analyzing different charters, we are able to identify additional building blocks of commoning

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which apply to commons that have existed and are facing obstacles to preservation and sustainability. That is precisely what these charters are trying to evoke beyond just explaining what took place around a certain common-pool resource before it was turned into or created as a commons. Practices of commoning need to be shown for when commons are already set up and are just trying to find a more permanent presence in their neighborhood. Such long-term viability requires adequate support from the state apparatus to protect them. It also requires regular and sufficient funding to take place in a consistent manner. And commoning practices also need to ensure a united force of commoners large enough and committed enough to affect the social and economic forces of today's reckless capitalist society, able to address issues of market failure and/or respond to government failure with creative solutions of lasting impact. Specifically, based on the earlier analysis of charters in sections 3.3.2 and 3.3.3, three additional building blocks can be incorporated into the notion of commoning. These building blocks are designed to make it easier for urban commons to be sustained for the long term. These building blocks are the chartering process, the push for partnering, and the potential for replication, all of which can be added to the theory of commoning beyond the initial set-up phases for commons highlighted by Iaione (2010) as well as Foster and Iaione (2017). These extensions will show how commoning moves beyond the creation of the commons and what tactics are needed to make commons more of a permanent phenomenon in cities.

3.4.1.1. The Chartering Process

The chartering process happens when commoners have created and agreed on rules and norms for a collective governance. Such rules and norms are being formalized precisely during this process as they are being written up in an official document that can be posted or shared anywhere. That document takes the form of a charter, which provides a roadmap for the steps taken to implement the needed governance structure and details how that governance is supposed to work. Specified rules must be respected and followed. The norms laid down represent the objectives and ambitions of the commons itself, and they are forged once the community has gone through several interactions together. Charters are also often used as a jurisdictional tool to give the commons a proper legal status.

While commons remain informal because they are designed to be adaptable to any local context, they require a certain legal presence in a city. Commons are obviously not for everyone, but charters can help commons get legal recognition they need to survive in cities. But they can also be used to show governments how their commons is governed and organized. Charters then become a legal mechanism used to engage in dialogue with the public authorities. Charters have proven vital in making the commons a visible entity within the regulatory framework of cities in conjunction with public and private sectors.

The rules that define the governance are collectively decided upon, and the chartering process is used to write them down and make them in that sense official. The collectively elaborated writing exercise is precisely what creates a charter. This typically happens after the commons has been set up, and there is proof that a collective governance structure exists which works well within the confines of a neighborhood. The end of this process is defined by the charter being printed and shared everywhere, or posted online so that everyone can see. Once the rules have been put in writing, they can be shared with interested parties. The sharing of these rules lets people know that there is a project responding to a need in the neighborhood, and it is also an invitation for people to join. Charters thus end up being used as official representations of their respective commons. All charters analyzed in section 3.3.2 were the result of such a process.

3.4.1.2. The Push for Partnering

Charters also often serve as a propagating tool with which to gain more partners as a means of support for their commons. Once the charter is written, commoners will look to partner either with other residents or neighborhood committees, associations, cooperatives or public benefit enterprises, as well as government agencies with relevant competencies and municipalities. The push for such partnerships is often defined by meetings or events where commoners invite chosen actors to discuss their activities, perhaps even invite participation in activities. Such meetings can even involve negotiating contracts or calling for support. Various communication strategies exist as commoning tactics to gain support. We can thus define the push for partnering as the step that bridges the commons with other major actors. The more partners a commons has, the more support it gains and the better its prospects for long-term success. With more support, commons have a

greater capacity to defend themselves when threatened by an exogenous force, such as land seizures for private development or electoral results favoring the demolition of commons. Having partners also improves the ability of commons to seek aid for their own development.

Commons can partner up for two reasons. The first reason is for legal purposes. As commons stand today, a major struggle they often face concerns the legality of their land property. In some cases, commons sit on underdeveloped land, and private developers might be keen on acquiring that land for their own business purposes. In such a case governments are key actors in stepping in and making sure that commons are on legal grounds to defend their property. Such partners then become quintessential for the survival of the commons. In addition, some activities within the commons may require a certain level of approval by the government. If governments are partners, they can approve such an activity. Having partners for legal reasons is why such a push is necessary. Contract negotiations can take place between the municipality and the commons so that an electoral change cannot threaten the contract conditions or a lease agreement signed for the commons to be built in certain spaces. This focused effort, where contracts are signed on behalf of commons development, is key in making commons permanent.

The second reason commons partner up is to look for funding support for certain projects the commoners would like to put into effect. Some activities require more than voluntary work and participation by commoners and their support cast for implementation. This can be the case, for instance, when an urban commons wants to fund something like a rainwater catchment unit for the storage and reuse of freshwater or a major event needing sophisticated forms of coordination which the commoners cannot afford by themselves. Funding may be required in such a scenario, and this can be done only if there is more financial support available. Funding can take place as a crowdfunding scheme. But this still requires gaining support from individuals which necessitates partnering up with committees or certain groups. Flows of capital can also come from partnerships with cooperatives seeking to join a commons initiative as part of their own business model, often a partnership proving very helpful for the long-term viability of commons. Since commons are not inherently profitable, seeking funding through partnerships is the only viable way commons can obtain some level of financial security. In funding neighborhood-based projects like cyclical recycling or circular economies, a partnership between commons and cooperatives can be the most

effective way of doing that. That is why the push for partnerships is such an essential step in the commoning process and can only increase support for such initiatives. We consider this network expansion via new partners therefore as a key form of commoning to render the commons more permanent in their neighborhood. With more partners, there will be a larger base of people using commons for their own benefit. This will also make the commons more attractive for governments to support as well. If they have a larger base of supportive partners, commons can create a lot of value for communities. I think this is an important consideration when evaluating the chances of commons becoming more prevalent in the fight against climate change.

3.4.1.3 Replication Potential

The third commoning activity relevant to the long-term nature of commons is their replication, based on developing tools that make the governance of commons replicable to other commons. Here commoners explore whether a governance in place has relevance for other situations and has elements that may even be adopted ubiquitously. The tactics undertaken to get to such a level of replicability can be then used as lessons learned for other commons and potentially usable by anyone. While these lessons learned may vary considerably from one situation to another, there may be other commons enduring similar challenges which renders those lessons learned applicable to deal with those challenges. Such a dynamic can forge a much larger base for commons around the world which would then translate into a more global commons movement. In order to achieve such potential for replicability, the key commoning tactic to use is posting these lessons learned online in an open source platform, readable to anyone. Such a platform should ideally by a hub of representative commons online, and the platform should connect different commons through shared themes and objectives. This also allows scholars to analyze commons at a meso-level and advance theories for more sophisticated application of commons creation and management.

By linking the commons together in such a way, commoners involved in other commons-based projects can read and use these lessons learned in a valuable way. Linking commons together also allows local movements to be created, because there may be more solidarity among local activists. Such link-ups then have the potential of creating a much more structured global movement. The larger that movement is, the more power commons will have in combating against dominant forces

of capitalism. But to get to that point, commons-governance schemes must be replicable amongst each other, and that requires enhancing replication potential through the sharing of information. As a result, replication deserves its own theoretical framework. Integrating charters into these online tactics fortifies this crucial aspect of commoning.

The chartering, partnering and replication processes all involve acts of commoning aimed at making commons permanent and replicable amongst each other. These building blocks involve measures typically taken after the commons are set up. That is why it is important for commons to undergo initially the very phases that were described in Iaione (2010) so that we can define the follow-up stage of commoning as building blocks for longevity. Crucial to those facilitators of longevity is in each instance the process of writing a charter and sharing the rules of the charter with others. That stage is followed by a period during which commoners seek partners for legal defense purposes or funding. Obtaining financial assistance and legal protections helps the commons grow in its neighborhood and secures its long-term viability. Commons, like all other social institutions, gain strength in numbers. Their spread will be greatly helped by rendering the commons replicable. These three new building blocks of commoning activity elaborated here enlarge the theory of commoning, addressing the often problematic question of the longevity of commons. I believe to have addressed this intellectual challenge in my thesis here by analyzing various charters as a tactical form of commoning and then extracting their shared overlaps.

3.4.2 Creating "Transitional Urban Resources" (TURs) as Urban Commons

The addition of new building blocks of commoning revisits the complex question how urban commons best evolve within the context of contemporary urbanization and city politics. That context is rendered even more complex in years to come by a steadily intensifying climate change crisis which is bound to have a major impact on how cities function and what they have to do for adaptation. Commons have traditionally been tied to natural resources, and this was also true for Elinor Ostrom's revival of the notion in the 1990s. Her field studies and research publications focused largely on natural common-pool resources like fisheries or forest management. That natural dimension obviously remains of paramount importance, especially when considering the context of climate change as an environmental crisis of the highest order threatening the human

species existentially. But Ostrom herself recognized towards the end of her life that the idea of common-pool resources (CPRs) worthy of consideration for commons may go far beyond just natural resources in 21st century capitalism.

Her goal with her research on commons was to take CPRs and subject them to the same design principles she observed in commons. Once those principles are successfully adopted in the management of a CPR, they become a commons by principle, and those design principles allow the commons to be reproduced, preserved, and regulated. As contemporary capitalism moves increasingly beyond manufacturing and basic services towards knowledge-intense services, crystalized in the digital economy of today and even more so tomorrow, what we have to come to understand as resources gains much wider meaning. Already in collaboration with Charlotte Hess (Hess and Ostrom 2007), Ostrom highlighted the importance of knowledge as a commons. These theoretical advancements would eventually be met with the notion of commoning as the driver and creator of adequate commons management. Commoning would again help scholars expand the notion of commons in new sectors where the governance forms would differ from Ostrom's original observations of how natural resource CPRs become commons.

The widening of the applicability of commons has also been well exemplified by Sheila Foster and Christian Iaione treating the city as a commons (Foster and Iaione 2016). Building on their argument, I have already noted earlier (in section 2.1.1) that the evolution of city-based resources turning into urban commons is different than Ostrom's analysis on natural resource commons coming from CPRs. As reiterated by Yochai Benkler (2013), most existing examples of urban commons come from open commons, such as public spaces or urban infrastructure, that eventually come to be governed by a governance structure where groups of organized citizens and their partners can exercise control over that urban resource. More often than not, urban commons thus take their starting point from Benkler's (2013) notion of open commons in urban settings. So, we already know that open resources in cities are different than the traditional sense of CPRs being ungovernable, and are often subject to loosely enforced rules and regulations.

As seen with Iaione (2010), resources in cities are often created, and not necessarily naturally occurring or existent. Urban residents and other engaged stakeholders can create new resources

out of nothing for the benefit of city dwellers and the well-being of their local communities. Such newly created resources can be set up from the very start as urban commons, through acts of commoning including tactical charters, in such fashion that their very creation as commons makes them valuable as an urban resource. For example, we will see later in a detailed case study of the Brussels-based Bassin Versant Solidaire de Forest (discussed in section 4.1) how neighborhood activists, with the help of researchers and engaged experts, have developed an alternative vision for addressing an urgent local problem, in this case flooding, which fits the area concerned more effectively than the municipality's top-down approach to flood control which relies heavily on large-scale structures. This alternative vision, which turns a watershed into an urban commons for decentralized water-flow management by means of an important socio-ecological and topological innovation the commoners have characterized as "new urban rivers," could only come about by consecutive and sustained acts of commoning which helped produce this new vision in the first place.

Taking account of the need for widening the applicability of commons and bringing this expansion to the challenge of newly created urban commons to help cities deal with the challenges of the 21st century, in particular climate change, we introduce here the concept of "transitional urban resources" (TURs). These TURs can bring a whole new range of perspectives that will help us rethink how a city can be managed. We define TURs as specific tangible or intangible resources derived from the social processes of commoning to help cities deal with problems beyond solutions shaped by the for-profit market mechanism or depending on the often limited and/or institutionally biased administrative capacities of government.

Such created TURs can include the greening of rooftops to cool city spaces, or implementation of urban gardens and planting of trees within those spaces to create carbon sinks. TURs of this kind do not have to be only material-based. TURs created by and for urban commons can also be immaterial, such as communal ride-share transport options, radical expansion of recycling (like the eReuse platform in Barcelona for the recycling of consumer electronics), decentralized energy production and distribution (including waste as energy source), collective tracing of climate change effects on city life, public education as part of the political activism process, or a new vision of flood control such as the one in Bassin Versant Solidaire de Forest in Brussels (see section

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4.1). These are all examples of TURs not only being created from scratch, but also based on a specific dynamic of social interactions that are not necessarily material. All these examples I mention here illustrate very well the broader point I am trying to make which is how TURs can be reinterpreted and expanded beyond referring to just a physical resource alone. These TURs are tied to the social process that defines commoning. Urban commons typically require more sophisticated social processes in order to be set up and maintained than natural resources.

As Linebaugh (2010) stated, the notion of commoning should be seen as social processes that revitalize commons. In accordance with our expanded vision of TURs, commoning creates new resources capable of directly confronting issues of climate change and capitalist thinking. We can therefore consider commoning as a key stepping stone resulting in the creation of a broad range of urban commons created from scratch. The observed charters we analyzed above (in section 3.3.2) all illustrate how commoning leads to newly created TURs. The charters are actually at the heart of this process defining and regulating the commons as a social process of resource creation. We will see this process play out even more clearly in the three case studies analyzed in chapter 4, all of them involving newly created TURs getting off the ground as innovative urban commons by sustained and multi-faceted acts of commoning, including the formulation of a charter at the heart of the resource creation process.

3.4.3 What is "Transitional" about TURs?

We refer to TURs as "transitional" for the obvious reason that such new urban commons advance the zero-carbon transition towards a successful conclusion inasmuch as they promote less carbon-intense social-organization or production methods, create new carbon sinks, improve energy efficiency, and so forth. Hence, we need to examine how such a more expansive notion of (urban) commons as newly created TURs can help cities tackle issues like climate change. The whole point is to argue that commons could, and indeed should, play an essential role in enforcing sustainability as an organizing principle on otherwise unfettered, profit-driven, private-interest capitalism. We need to reinvent resources that counter capitalist notions such as "planned obsolescence," "waste," and "short-term thinking." That is why newly created TURs devoted to climate resilience might prove such a strong social mechanism, as alternative visions yet to be turned into reality via social

innovation and neighborhood activism. We can see such TURs being set up precisely in promotion of this ecological transition when looking at the eleven tactical charters analyzed in section 3.3.1, from the Eco-Habitats and Zero-Carbon Neighborhoods pushed by Association Ecoquartier or the bio-region vision of the Concerned Communities of Falkirk or the eco-tourism services of the Hôtel du Nord to the three case studies chosen for further, more detailed analysis in chapter 4 which include a watershed as urban commons for better flood control, an urban resiliency farm taking a new approach to urban farming, and a unique historic legacy site turned into a cultural commons giving an urban park new life and meaning.

But the quality of "transitional" may well have an additional meaning here to the extent that we are referring to new urban-commons resources which help push social and political forces towards an alternative, more ecologically grounded economic system, a different type of capitalism if you will. Such transitional urban resources can foster short-circuits connecting consumption more tightly to production on a local scale, extend life cycles of existing products and recycling of materials along the principles of the circular economy, or embed as commons in a broader context of the social and solidarity economy.

3.4.3.1 TURs and Short Circuits

One of the TURs created through urban commons that is considered "immaterial" and "networkable" is the so-called Short Circuit (Douthwaite 2003) where goods can be used, transferred, and recycled from one user to another within a specific area, providing a blueprint for a self-sufficient local economy to escape the vicissitudes of globalization and the systemic risks of catastrophic disruption it creates. This type of initiative is becoming more prevalent in cities, because it offers access to resources that were once lacking, especially to marginalized groups, and can thus meet specific collective needs at low costs. We need to see how the Short Circuit can be expanded.

As a matter of fact, placing urban commons and chartering practices at the center of the "Short Circuit" strategy may very well boost our collective capacity to develop the tools necessary for adapting to climate change. The creation of short circuits through commoning is visible in case

studies like Agrocité (see section 4.2), whose urban farming and recycling facilities allow food and waste products to be produced and consumed in close proximity to each other. To the extent that communities can thereby gain more control over how they produce, distribute and consume food, while avoiding traditional for-profit channels (especially problematic because of "food deserts" prevailing in marginalized neighborhoods), they become also more resilient in the face of climate change and its impact on food. The Agrocité example, discussed in the next chapter, is thus a fitting illustration of the double meaning of what is "transitional" in TUR as it combines short circuit, as a strategy transforming capitalism for the better, with making progress in the fight against climate change.

3.4.3.2 TURs and the Circular Economy

Another set of TURs that can be created by commoning processes as urban commons involve the circular economy (Ellen MacArthur Foundation 2019). We can define the "circular economy" as an economic sub-system aimed at extending the lifespan of certain goods and resources through leasing, reuse, refurbishing, and recycling. Value gets created by keeping these goods and resources usable for an extended period of time. That value gets extracted from a process of recycling waste, and creating usability from that waste.

Helen Micheaux and Franck Aggeri (2019) have already thought of linking commons to the circular economy which is created by groups of people who have an ambition to recycle and produce and create value out of waste. The authors use waste as an example of a resource to manage as a commons, framed in connection with the circular economy. Wastes from second-hand products abandoned by their former owners can be turned into resources which can be exploited for extraction of primary raw materials and rare metals to produce other goods with. Micheaux and Aggeri (2019) argue that wastes have the potential to be a TUR with collective governance structures derived from commons through the collective rule-making of eco-organizations and governments who seek to take waste products beyond the end of their life cycle and make value out of such a process. A mixed governance model, where states enforce waste management and eco-organizations create the nodes of a circular economy, fosters a form of co-regulation between

these two actors. This co-regulation is the result of collective action being used to create such a circular economy model, transforming waste into a resource that could be managed as a commons.

Communities get empowered using the circular economy, because it allows them to move away from the dependencies we face in contemporary capitalism (the "linear economy") from its willful promotion of "planned obsolescence" and its "throw-away" culture of consumerism. These wasteful practices leave us exposed to relentless extraction of finite raw materials and a dynamic of throwing away cheaply made goods. If we are to reach the ecological transition, a circular economy may prove vital as it incentivizes recycling practices that prevent needless extraction of raw materials and the pollution that comes from producing cheap goods designed not to last. For urban commons focused on climate change resiliency, creating or being a part of the circular economy is imperative. Commoning processes have proven capable of creating such TURs, as illustrated by our case study of Agrocité (see section 4.2) creating a circular economy in the north-western suburbs of Paris with the help of recycling programs run by cooperatives like Recyclab in the area.

3.4.3.3 TURs in the Social and Solidarity Economy

TURs can be produced by many urban commons. However, the TURs yet to created, with acts of commoning at their core, will often be better secured as commons if they can get connected to cooperatives, public-benefit corporations, non-profit NGOs, and other actors of the Social and Solidarity Economy (SSE). There are many instances where commons have the opportunity to be merged with other actors of the "Social and Solidarity Economy" and then benefit from such integration with a better chance to achieve their goals (Guttmann 2019; Guttmann 2021). We can even legitimately debate whether the SSE and its networks are TURs themselves. Nonetheless, the partnership between SSE and the commons in creating TURs deserves more attention, because the two are to be seen as complementary and mutually enriching, with both centered on participative governance.

A good example of such integration is Barcelona's eReuse program (ereuse.org). The members of the cooperative have contributed to the city's Procomuns: Commons Collaborative Economies

initiative (see section 2.6.2) by creating a TUR through a circular-economy recycling program where materials from used computers are recycled and used for other purposes. Such recycling initiatives as eReuse point to the potential of creating TURs from scratch as commons for the so-called circular economy keeping products and materials in use while also regenerating natural systems (Ellen MacArthur Foundation 2020), a notion which has already found growing support among European authorities (European Commission 2020; Ministère de la transition ecologique 2020). But the eReuse example also illustrates the value of embedding urban commons within the broader context of SSE, in this example a cooperative turning waste management into an urban common of recycling innovation.

We can look at this connection also usefully the other way around. What is the point of many SSE actors, from cooperatives to non-profit NGOs, if they are not there to push the confines of economic activity beyond market and state to create community-based commons as transitional urban (or rural) resources which neither for-profit motives nor public administration produce well, if at all? If we think of commons in terms of transitional urban resources yet to be created in acts of commoning engaging citizens as stakeholders and commoners, then we can perhaps also legitimate vectors of the social and solidarity economy transforming capitalism towards a more sustainable-development-oriented system.

Section 3.5 Concluding the Chapter

Following the methodologies of Ostrom (1990) and Iaione and Foster (2016), we have learned about key qualitative research methods that can be used to analyze urban commons at a deeper level. These qualitative methods are derived from participatory action research used to understand key interactions that make up acts of commoning and determine how urban commons are created, developed, or nurtured. Continuing the scholar-activist tradition of these experts of commons, I developed my own research method using discourse analysis to examine charters in order to understand better how urban commons can relate to each other irrespective of their own unique contexts and specificities.

In my methodology, acts of commoning are analyzed through a series of eleven charters that reveal a range of different governance schemes applicable to urban commons. These charters were collected in a PPOSUC, the *Remix the Commons* platform, where I used them as a database to organize data and findings (see section 3.3.1). The charters proved to be effective in my research, especially to the extent that they were used as jurisdictional tools by the commoners themselves to open dialogue with legal authorities or show how their governance schemes work to achieve their objectives, which in most cases were about advancing the ecological transition.

Those charters allowed me to specify an ensemble of commoning activities that were apparent numerous times in these documents (see section 3.3.2). By using discourse analysis to analyze each charter and identify different commoning strategies, I was able to determine whether the charters are formative or directive, which was meant to distinguish between charters used to build the commons governance from scratch or charters used to propel the governance forward. I also determined whether their commons were internal or external, meaning whether the communities around the chartering process were either tightly knit amongst each other, or whether the communities included partners outside of the commons to also participate in the writing of this charter. The charters, and these classifications, proved useful in understanding the complexities of commoning, and how they shape urban commons to become transitional tools for cities in developing climate change policies. Putting these categories of commoning together, I was able to write a document summarizing various commoning tactics. This document is named the Tactical Chartering Manifesto (see section 3.3.3 and Annex), with principles and defined acts that could be useful for any commoner.

This research work demonstrates how developing charters can be helpful for improving governance, a process I have termed "tactical chartering." This process would be a part of commoning "building blocks," which are the steps needed to do commoning and so secure the long-term viability of commons once set up. I think that those building blocks, which are thoroughly explained in Section 3.4, can usefully expand on the research by Iaione (2016), who focused on phases of commoning, to include partnering and replication as key processes necessary for commons to become a long-term viable tool for ecologically minded cities.

Highlighting in chapter 3 how such methodological and analytical tools as online platforms known as PPOSUCs, tactical charters, and transitional urban resources can render urban commons a crucial tool in cities facing the ecological transition, I shall introduce three case studies in chapter 4 to shed more light on these tools. Specifically, I have analyzed in detail the watershed commons Bassin Versant Solidaire de Forest (section 4.1), the urban resiliency farm Agrocité (section 4.2), and the cultural commons Murs à Pêches (section 4.3). All three urban commons shed more light on the interplay of commons building blocks, acts of commoning, and tactical charters in the creation of transitional urban resources as urban commons. Such TURs are in fact a key part of urban commons implementation, putting urban commons in a strong position to become the defining tool in cities that eye an ecological transition.

Chapter 4 – Case Studies

After summarizing all of the methodological components of my research in chapter 3, I test those by focusing extensively on three case studies, each of which part of the charter network developed in the Remix platform. While very different on their own in kind and scope, all three share the notion of urban commons being developed to find climate change adaptation measures and solutions that help cities push their climate-policy agenda of ecological transition. Thanks to my methodological tools, I was able to analyze each of the three governance structures in great detail – the Brussels-based watershed commons known as the Bassin Versant Solidaire de Forest (section 4.1), as well as Agrocité (section 4.2) and Murs à Pêches (section 4.3) both on the outskirts of Paris.

In other words, chapter 4 summarizes the use of these tools through three case studies, each of which representing urban commons in practice and how they work on the ground. All case studies are organized in the exact same way to show fluidity and coherence with the results of my research, using the methodological tools described in chapter 3. The first section of each case study presents information on the type of resource analyzed, its geographical location, historical background, and the ecosystem services it produces. Then, for each case study, a second section identifies and analyzes the composition of each community around that urban commons resource as well as relevant partners that are involved in the governance structure of each urban commons. The third section of our case studies focuses on the commoning tactics used to achieve a coherent and collective governance structure. This section is at the heart of what makes these shared resources urban commons applicable to climate change adaptation. The last section of each case study focuses on the charter written to summarize all of the tactical commoning measures used to put in place the governance structure of each urban commons.

Section 4.1 Case Study #1: Bassin Versant Solidaire de Forest

This first section will present the first case study, called Bassin Versant Solidaire de Forest. We will go over all the details regarding this case study, including background information, the

community, their governance structures, commoning tactics, and their charter. The charter is found in the REMIX the Commons platform.

4.1.1 The Nature of the Resource as a Commons

Climate change is not at least a problem of water, of too much of it (as in rising sea levels, or floods) and at the same time too little of it (as in droughts and desertification), as cumulatively changing weather pattern wreak havoc with the existing balance between water and land, between water and the other elements. Cities will get flooded regularly, as already the case in Venice (Italy), Dhaka (Bangladesh) or Djakarta (Indonesia), or they will run out of drinkable water altogether, as happened recently in Cape Town (South Africa). Cities have to face these threats while having built up lots of impermeable surfaces disrupting water flows which locks them into increasingly costly, structure-heavy, and top-down centralized water-management and flood-control approaches. Turning the watershed of a heavily populated and built-up residential area into a locally managed urban commons allows a new systemic approach to these water management problems which, with citizen input and different expertise gathering, can rethink water as a resource and so propose to manage it differently. Precisely this has been attempted on the southern outskirts of Brussels (Belgium), a city with a good deal of flooding and water-flow problems, which we have analyzed in greater detail here. Such an alternative vision of water-flow management as a radically different method of flood control, which adapts to the local social and topological environment by relying on a decentralized network of water-flow management constructs the Forest commoners have characterized as "new urban rivers," is a perfect example of a vital new transitional urban resource (TUR) usefully applicable across the globe in cities facing intensifying flooding problems and water-management challenges, byproducts of climate change to which many cities will have to adjust in profound ways.

4.1.1.1 The Watershed

Our first case study, analyzing the Bassin Versant Solidaire de Forest in Brussels (Belgium), concerns a watershed as the main resource to be reorganized as a commons in order to address a chronic flooding problem more effectively. A watershed is a geographic area whose collection of water, either from rain, melting snow, or streams, flows or drains into a larger body of water which

could be a river, a lake, or the ocean. John Kerr (2009) applied the notion of a watershed more specifically to an area bounded by a ridge line that captures rainwater due to gravity and drains it to a specific location downstream, usually a river or stream which may well escape eventually into a lake or the sea. Watersheds can come in many forms, either being man-made or being completely natural. They can also differ quite a bit in size. They are usually inserted in hydrographic basins and can comprise sub-basins and sub-watersheds.

Watersheds collecting water and letting it flow downstream often give naturally rise to rivers. Any city located in or around a watershed has to take its geographical presence into account. Good water management is key to this. Cities, which have changed the geography of these rivers or have eradicated them altogether to put in place roads and other forms of infrastructure, typically have to deal with specific challenges of water management. Cities with poorly managed watersheds run a risk of damaging their core infrastructure.

Water as a common good presupposes a relationship between people, the territory, and its geography. Water management is thus defined by the human relationship with the geography of the area, specifically the location of a city relative to its watershed. Unlike many types of urban commons created by the community itself, watersheds are natural geographic phenomena which people have to learn how to live with. Land use planning is thus at the heart of how inhabitants treat the watershed as a commons. Here we take the Forest watershed in Brussels, Belgium, as an illustrative case study.

4.1.1.2 Geographical Location

The Forest watershed is located in Brussels, about four to five kilometers south of the city center, and part of a catchment area occupied by the commune of Forest itself. There are two urban parks in the area, the Parc Jacques Brel and the Parc de Bempt. The parks are largely man-made, though some areas consist of semi-natural and fully natural areas where local wildlife is at large. These two parks connect the communes of Uccle, which is upstream, and Forest, which is downstream. According to Ananda Kohlbrenner (2014), the urban typology consists of dense residential areas that are made up of semi-detached and detached housing. The topography of the area is very hilly.

As a matter of fact, the commune of Forest is considered to have some of the steepest slopes in the entire urban region comprising Brussels. The general neighborhood also includes offices, warehouses, and two schools for the surrounding residents, so that there is considerable commercial activity in the area. The main issue is that this area is subject to flooding whenever hit by heavy rain.

4.1.1.3 Historical Background: The Problem of Inundation

Accounts of local flooding have been documented at least since the 17th century, as noted by the Belgian historian Louis Verniers (1949), who recorded four to five major floods per century between 1614 and 1814 in the area. However, the population along the Senne river ensured its wealth by using these fertile alluvial plains thanks to the watershed collecting and distributing grounds to communes of the region. In addition, the paternalistic management of the abbeys in this commune had acquired a certain mastery of water management. Since the earliest recordings the local population had benefitted from access to good agriculture and water management.

Fortunes shifted when the abbey disappeared and the area became gradually exposed to urbanization and industrialization. As a result, the watershed management in place for decades underwent radical change for the worse. Chloë Deligne (2012) recounts in detail the huge urban renewal project known as the "Covering of the Senne" between 1867 and 1871 which redirected the river into underground waterways, connected the sewage system to it, and built boulevards on top of it. Rapid industrialization caused a certain neglect of the health of the watershed, as working populations and enterprises prioritized economic development over long-term watershed planning. Several ravines and waterbodies had been modified or eradicated to make way for industrial sites. Waste disposal practices by manufacturing enterprises using waterbodies degraded the conditions of the watershed tremendously over the years. The loss of ravines and waterways increased the risk and severity of the flooding, and the nearby population had become victim of this industrialization process.

The commune of Forest is an urban area that experiences floods on a regular basis. The slope to which this neighborhood rests is steep, and gravity makes water flow quickly downstream. An

issue exacerbating the violence of these floods is the fact that many waterways, which naturally control the flow of water, have been waterproofed for decades. Impermeable soil prevents the water from getting absorbed by the land which instead remains on the surface, letting gravity dictate where it will flow and come to rest. Since the nature of the watershed does not allow water to spread out, specific areas at the bottom of the slopes downstream are at imminent risk of getting flooded badly. Residents living downstream often have to deal with floods which directly threaten their livelihood.

Due to the eradication of these natural waterways, other problems related to flooding have arisen. Many floods have been made worse because of soil sealing whose resulting soil impermeability prevents water from getting absorbed properly. Much of the flooding saturates the sewer system. When it has collected too much water at any given time, the overburdened sewer system floods into the streets during heavy rainfall. Several springs are located in the same altitude along the slopes as railway tracks. Those tracks block the water from passing through. And so, the water ends up being in a dead end, forcing it not only to flood the surrounding infrastructure but also the cellars. The rate and frequency of these floods are a major concern for people living in the watershed area. Several households are susceptible to severe flooding on occasions that happen more often than once a year.

A study by Stéphanie Vanhuysse, Jeanne Depireux and Eleonore Wolff (2006) "on the waterproofing in the Brussels Region and possible measures in terms of urban planning to improve the situation," confirms that the situation has exponentially worsened over the past twenty years. For example, according to a draft of the regional water management plan of Brussels for 2016-2021, between 2005 and 2013 there was a flood every five months on average. Today, the flooding has become a state of emergency for the state to address, and the state has been scrambling to find solutions to deal with the problem.

The government of Brussels has proposed to build a large storm basin at the Square Lainé, a historical square of crucial importance to the neighborhood. It is a central meeting zone with a myriad of recreational activities available for the residents. The planned basin would be 5000 cubic meters, which is enormous. The neighborhood would obviously have to be modified to provide

space for the basin. In addition, construction would take years which would make the square largely inaccessible to its residents in the meantime. A vast majority of the residents have strongly opposed this construction project, because it destroys the general fabric of the square and therefore of the neighborhood. There is also concern that this option is not sustainable, because the water would be stored in a massive pool made of concrete instead of getting naturally filtered out of the area. The water, thus stored only to avoid the floods, would not even be accessible. This option is viewed by residents as completely impractical and unsustainable for the neighborhood's future, especially when dealing with problems of inundation.

Vivaqua, the government agency responsible for providing Brussels with its drinking water, is in charge of this huge storm basin project. Vivaqua does not deny the hydrological potential of the area. But its representatives believe that the timeframe for setting up the systems will be too long before showing concrete results. Vivaqua also declines all responsibility for water flowing on the surface (and not in its pipes), thus blocking any possibility of funding. That is why there is a huge risk that this basin will be constructed at the expense of the quality of life of the nearby residents. Local neighborhood organizations are strongly opposed to this plan and are instead promoting an alternative project that would render this watershed into a commons.

4.1.1.4 The Commons Approach as a Solution

The rapid changes brought about by industrialization have had perverse effects on the watershed today. Steep slopes, combined with the ever-increasing impermeability of the soil, have caused many floods from which the district suffers regularly. Although water is nowadays hardly visible, it manifests itself in problematic forms at the bottom of the valley. There buildings are all affected to varying degrees by flooding from sewer backflows, runoff, basement backflows, roof and garden runoff, and flooding of neighboring houses. Forgotten rivers, unrecognized bodies of water, cause seepage or worse. Between 1940 and 2005, the commune of Forest urbanized to the point of increasing the area of impermeable soil by 26% (going from 40% in 1940 to 66% in 2005), with half of that increase arising over the past dozen years (from 1993 to 2006). According to the figures presented by the municipality of Forest at the Round Table of 18 March 2014, 40% of the soil in

the valley would be waterproofed and impermeable. This only accelerated the disastrous effects of flooding.

The idea behind treating this watershed as a commons is to find other forms of water management which mitigate floods and also might serve as a potential resource for inhabitants to use. The project involves recovering water from paths and rooftops of residential buildings as well as reinventing the paths of the water flow through a concept called "nouvelles rivières urbaines" which translates as "New Urban Rivers" (NURs). The water thus recovered could be used to feed ponds in nearby parks by reconnecting clear water collectors to them. Such an arrangement would disconnect the immediate freshwater from the sewer system, reducing the risk of saturation in the sewer systems.

In this context, it is important to understand the flooding of the watershed as a crisis that needs to be solved from within, where inhabitants have more control by using participative tools to respond to such an existential crisis. The watershed-as-commons project arose from a citizen movement organizing the community to find alternatives to the proposed storm basin planned at Square Lainé. Upon obtaining knowledge of the situation, the inhabitants quickly determined that this problem required decentralized planning. The centralized top-down planning of the city administration determined the water itself to be the problem, but the inhabitants discovered that this was not the right approach. By framing the problem in terms of where the water falls instead of thinking of the water itself as the problem, it is clear that the solution requires a decentralized approach. The inhabitants of the area determined that the problem originates from the whole catchment area and upstream water flows.

The habitants decided to place more emphasis on the upstream water flows. Simple technical devices could be set up to infiltrate water, evaporate or evapo-transport it, and thereby slow down flows. Devices, such as ponds, areas of vegetation, NURs, and cisterns, were easy to set up and could be installed by the inhabitants themselves. In addition, these devices can be used creatively in ways that would improve the surrounding natural environment and rehabilitate the overall vegetation of the city. Installation and maintenance of these technical devices would be done in a participative manner. The simple perspective of solving this water crisis in a decentralized manner

through the enactment of participative actions means that the watershed begins to be perceived as a commons. This commons approach not only resolves the issue of flooding, but also addresses the underlying issue causing the flooding, which is soil sealing.

The commons approach spurs democratization of overall urban management, which also facilitates rethinking collectively the city's relationship with nature. One of the key elements of the commons is to change the political language of a territory and open up new debates where the involved actors get more implicated in the management. In this case, it is not only the engineer working alone and following a top-down approach to resolving urban issues, but everyone becomes implicated. The commons movement has the intention of influencing the political sphere and enlarge its impact on the urban as well as regional level. That influence of commons, especially its capacity to expand its network, is evident with this case. Work in the general area of Forest has brought forth new forms of innovation in participatory urban planning by introducing educational collectives in the area where inhabitants can develop and share knowledge of the surroundings. In addition, the radical concept of NURs was also a key innovation in the participatory planning of the watershed commons.

Our case study also illustrates how important it is not to treat water as a source of commodification. Instead water must be treated as a common good because of its nature. There is no social or economic condition that can change the way water works. Because it is a resource needed by all for whatever means, it is perceived as a responsibility of the state. Therefore, municipal water is defined as public common good. But in this case study that notion is challenged, especially concerning the ambition of turning this common good into a commons. And if it is managed as a commons, then there needs to be mobilization for collective action around a widely shared and collectively elaborated objective towards sustainability. The question is, what does water as a commons entail?

Water as a common good needs to be dealt with in relationship to its geography and territory. It moves around several boundaries, whether those boundaries are physical or administrative. These human-based forces must work with the land to manage water properly. Land use planning is at the heart of water management, and there is a need for polycentric solutions to manage this

adequately. Water as a common good also challenges the usage of technologies to solve all problems. Technical choices need to be questioned. To reduce flooding, the solution of using NURs can be effective, because it offers an increasingly diverse range of possible choices.

Water is typically removed from the daily concerns of inhabitants until they see their water bills. It is only then that they may realize that they are paying for some form of water management, a point strongly emphasized in the radio podcast I undertook for this project. Local inhabitants delegate water management issues to their municipal administration, who then engages technicians and private finance to find and fund solutions. This process of delegation means that inhabitants do not really have any opportunity to develop their own forms of water management. Yet a centralized top-down approach may be inadequate, such as the one proposed here by Vivaqua to build a huge hole for storing storm water in the middle of a historic urban square.

People need to have more control over how the water in their territory is managed. Water at this stage is financed by public authorities, with a consumer-customer approach that places all the financial burden on the customer, meaning the area's inhabitants. Current mainstream practice only reinforces the technical and economic dimension of water management. But management needs to go beyond that. It needs to be participatory. If water is truly perceived as a commons, then there needs to be continuous dialogue between political decision-makers, technicians, water operators, researchers, and citizens. Together, they promote the emergence of a collective intelligence and global vision of the issue of water in the totality of its environment, enabling more open and concerted decision-making at several levels.

According to Elinor Ostrom, Paul Stern and Thomas Dietz (2003) managing water as a commons is based on individuals finding creative ways to manage resources considered common property. Such a vision moves us away from the idea that management problems should be tackled by external authorities pushing centralized regulation or complete privatization of water. Required instead is a mix between private, public, and communitarian needs to address issues of water.

4.1.1.5 Ecosystem Services

As a commons, a watershed might provide a variety of useful ecosystem services besides the most pressing objective of containing flooding that up to now had been hard to control. The collective governance in managing the watershed as a commons can improve its health which makes it more functional to its surrounding habitants. While a healthy watershed improves the lives of residents by bringing ecosystem services to them, it needs to be maintained and managed properly by the inhabitants to make it beneficial. Thus, one of the objectives to turn the Forest watershed into a healthy watershed is based on the sort of ecosystem services that residents can benefit from if they manage the watershed in a diligent, sustainable way.

The U.S. Environmental Protection Agency (2015) provides an explanation of the ecosystem services that watersheds provide when they are in healthy condition. It distinguishes three categories of ecosystem services, which are natural, economic, and social. The listed ecosystem services that arise out of a healthy watershed are nutrient cycling, carbon storage, erosion control, sedimentation control, increased biodiversity, soil formation, wildlife movement corridors, water storage, water filtration, flood control, food, timber and recreation, as well as resiliency against invasive species and climate change or other natural disasters. We are thus talking here about major improvement in water quality, increased capacity for carbon storage, as well as strengthened overall resilience, both in dealing with climate change effects and colonization of harmful invasive species.

There are also ecosystem services which provide economic benefits as well. Those are mostly related to cost reduction measures for neighboring inhabitants and improved infrastructure that deals with flooding more efficiently. Healthy watersheds reduce infrastructure costs for water management and wastewater treatment by naturally filtering the pollutants in the water, which in turn protects water quality. A study by Caryn Ernst, Richard Gullick and Kirk Nixon (2004) concluded that watersheds having drinkable water are cheaper to operate if there is forest cover doing some of that treatment work. For every 10% increase in forest cover the source of freshwater reduces the costs of chemicals and treatment by 20%. In addition, a healthy watershed also reduces flood mitigation costs, because natural cover on the watershed minimizes the impact of floods and

reduces the need for adequate public drainage systems to the extent that plant cover filters and soaks in that extra water. A healthy watershed able to contain flooding will also be economically beneficial to nearby homeowners by increasing their property values. Other benefits include lower rates of illness, decreased stress from potential damage of flooding, and new recreation areas where the surrounding inhabitants can benefit from nature.

In the case of the Forest watershed, rendering the Bassin Versant de Forest into a commons provides specific ecosystem services to the area by managing water to increase biodiversity in the region. It is well documented that increasing plants and vegetation can be excellent support for water management. To start, plants absorb and evaporate water through evapotranspiration. Plants can purify the water through phytoremediation. If plants are placed in different places of the water management chain, they can provide several of the ecosystem services explained above. Therefore, a variety of plant forms are valued, which improves the overall biodiversity of the region. To conclude, revegetation can tread soil and water pollution, in particular the hydrocarbons that end up all over the area. Hydrocarbons are a form of pollutant that can be very harmful to the environment and the people living in it. Heavy metals are another pollutant remediated by increased vegetation. The root systems of some plants fix heavy metals in the soil. Above all, many plants store bacteria and fungi in their roots, which attack pollutants such as hydrocarbons, eat them, break down the molecules and make them disappear. Some plants absorb heavy metals and store them in their tissues, thus cleaning the soil.

Without the commons approach, water is managed through technologies funded by the state or by private entities. They have to pay for services related to water purification, its transport to the city, its collection through the sewerage system, and its purification. This is costly for the inhabitants having to pay taxes for these expensive systems. Without finding adequate solutions, these costs are constantly increasing. Because of more sophisticated drinking water treatment, the renewal of infrastructure, and increasingly strict purification standards the state has to spend ever growing amounts of taxpayer money to keep this form of water management going. The environmental costs of this management are still underestimated and not integrated into the price of water in Brussels. In Brussels, the price of water is calculated on the basis of quantity of water used,

meaning the price per liter augments with the amount of water used. Water is thus obviously considered a commodity.

Alternative approaches to water management would create new forms of employment linked to developing various decentralized tools used in the collective management of the watershed as a commons. These new jobs are not in the traditional field of water management, such as sewerage and other sanitation professions, but rather related to engaging the community and searching for participatory and innovative tools to decentralize water management and use the water to the benefit of the community. There is still a lack of decentralized water professions that could be found in the city districts. In a city with many unemployed people that source of alternative employment deserves to be exploited more. One can also imagine creating social economy enterprises and cooperatives that meet these new needs. These ecosystem services created by the watershed as a commons should be considered not only in Brussels, but also elsewhere.

4.1.2 The Community and its Partners

To cope with the financial pressures of managing a watershed, public authorities are obliged to work in collaboration with the ever more powerful financial capital. While financial capital can help fund large-scale projects, there is a risk of designing such projects strictly from the perspective of the private profit motive, while the citizen gets left behind. This trend, especially when managing water as a common good, has to stop. That is why empowered citizen should gain some capacity to find financially sound solutions to water management while at the same time managing water based on their needs. Such an eco-systemic approach requires decentralized forms of the economy and/or a much more democratic management of tools.

4.1.2.1 The Composition of the Community

Water management is typically a policy area for local government which in the case of Brussels is a traditionally complex affair given the decentralized and multi-layered administrative structure of the bilingual capital of Belgium. There is the truly local administration, the so-called "commune" of which Brussels has nineteen. Our case study focuses in particular on the 'Commune of Forest' (or Vorst in Flemish). This commune happens to be very involved with the complex water

management issues of the local area. On the regional level is the "Brussel-Capital Region" which develops comprehensive, region-wide water policy based on five-year Water Management Plans following a participatory process of consultation and debate. Its latest WMP, for example, is officially known as the "Plan de Gestion de l'eau 2022 – 2027" and can be found in https://environnement.brussels/thematiques/eau/plan-de-gestion-de-leau/plan-de-gestion-de-leau-2022-2027. Rounding out the triarchy of state actors is the company Vivaqua, a public company responsible for the production and distribution of drinking water in the Brussels region, management of sewer networks, and also, crucially, flood control.

The Brussels region has already had early on strong community-based organizations pursuing alternative environmentalist objectives opposed to profit-driven urban development, notably the *Inter-Environnement Bruxelles* (https://fr.wikipedia.org/wiki/Inter-Environnement_Bruxelles), a non-profit association grouping together over eighty neighborhood committees in defense of the environment. The IEB has been active since 1974, providing an infrastructure for active citizen engagement.

During the past fifteen years the confluence of increased threats of floods and community opposition to top-down imposition of large-scale flood control projects has convinced the local government administrators to seek more community input and explore possible alternative water management strategies. The Brussels-Capital Region had already recognized the need for participatory water management when it released its water framework ordinance in 2006. In 2011 the regional authority launched a public inquiry which helped it realize that participatory water management is more effective when done in a catchment basin. Ever since there has been more coordination aimed at thinking of strategies how best to protect residential areas along the watershed from its inundations, while also seeking other forms of water use from the uncaptured water. Towards those objectives the commune of Forest set up working groups to study how best to manage the watershed. These groups engaged local residents and assigned them to water operators dealing with specific issues related to water management. It is from the studies of these water working groups that the commune decided to pursue a more solidarity-based form of watershed management. At the core of this strategy was the development of a comprehensive communal plan for flood control.

4.1.2.2 The EGEB and its Role

These local government efforts at increased citizen engagement on issues of water management, crystalized further by public outcry against Vivaqua's proposal for a huge storm basin under the Square Lainé (https://archives.ebp.be/fr/bda-autres/marche-public-vivaqua-8393402/), spurred the founding of *Etats Généraux de l'Eau à Bruxelles* (https://www.egeb-sgwb.be). For nearly a year, from April to November 2011, the EGEB accompanied the aforementioned public inquiry on the Water Management Plan which the Brussels-Capital Region was conducting (see the link https://environnement.brussels/thematiques/eau/plan-de-gestion-de-leau). EGEB was created to implicate inhabitants in watershed management and have them gain a voice on what can be done to find sustainable solutions to the local water-flow and -catchment problems. Already at the end of its 2011 deliberations EGEB published its "Proposition for a Participatory Water Policy in Brussels" (https://www.egeb-sgwb.be/article169.html) incorporating its alternative vision for an inclusive bottom-up policy of water management and flood control.

EGEB's policy alternative is based on the idea of exploring avenues of radical change in how water is managed. The idea arose amidst a confrontation between the major authorities in charge of water management, the private entities hired by the authorities, and the citizens who demanded their voices to be heard. The confrontation focused on whether to accept the commodification of water or instead treat water as a common good. From past experience, it is clear that the private sector, for whom water is a commodity, tends to win. So, there is a need to counterbalance that trend. Water management is one of those policy areas where primarily economic considerations dominate policy-making to the detriment of the political drive for greater civil society.

In their pursuit of a more comprehensive eco-systemic approach EGEB and the participating residents it helps to mobilize want to reinvent nearby neighborhoods as sources of short circuit economies. The notion of short circuits, popularized by British economist and environmental activist Richard Douthwaite (2004), implies in this context new forms of compensatory measures for urbanization and fiscally sound funding measures for the "New Urban Rivers" (NURs) in the urbanized catchment areas. Instead of opposing city and nature, it is a question of considering water and its cycles at the very heart of the built environment. The city has repressed water. It is a

question of giving it back its place and, with it, to nature as a whole. Moreover, Brussels lacks many professions to create a new urban relationship with water. Collective action in the Forest watershed can help create new expertise that will vastly benefit the public authorities in charge of managing water.

In addition to finding fiscally sound solutions to managing the Forest watershed, the notion of neighborhoods as short circuits seems to be essential for integrating life cycles and creating harmonious spaces for urban development within and around the watershed. Short circuits aim to have communities build up their local economies to supply the goods and services they would need should the mainstream economy collapse, and that includes preserving the environment as well. Many neighborhood committees are integrating environmental data into their actions. Brussels Environment has already launched two sustainable neighborhoods. Neighborhood contracts are increasingly integrating environmental issues as well. The EGEB tries to study how these short circuits can be implemented through citizen mobilization and how that can influence certain aspects of water management.

Other organized actors involved share EGEB's objective of managing this watershed so that natural catchment areas get transformed into spaces of solidarity. I am referring here in particular to sustainable neighborhood committees from residential areas near the Forest slopes, notably from Zanbeek, Vossegatbeek, and Senne. Those bring together residents who have a fundamental role in introducing alternative water management schemes to protect their own neighborhoods. Some of these neighborhood committees organize contracts for public or community-based projects. Others share their historical knowledge of the area and/or scientific knowledge of the geographical formations of the watershed. Some committee members just want to envision solutions to minimize the risk of flooding or water discharges into the sewers.

A new alliance between the politician and the citizen is needed to seek alternative solutions and enrich the field of possibilities, but also to reverse the balance of power. It was within that context of tensions surrounding water that the EGEB was born. The objective of EGEB is to move away from top-down centralized or privately financialized approaches by creating instead hybrid spaces for experimentation and forums on multiple scales. EGEB has claimed on its website

(https://www.egeb-sgwb.be/rubrique2.html) that: "…At the end of this loop of thought/action, an intuition comes to us. It is that the commodification of water, which is certainly based on strong ideological thinking, is spreading for many because of the segmentation of all scales of action of this good, from the most local to the international. Market opportunism is part of our pragmatic inability to build collectively the management of this natural resource." It is by moving beyond "market opportunism" that one can finally use the watershed as a commons for socially and ecologically oriented reasons.

The EGEB has been able to invent a new term to describe its objectives, which is "watershed solidarity". That notion defines a relationship between a city's inhabitants and the geographical substratum on which the city is built. Specific human relationships to the geographical substratum are inscribed, and it is necessary to eliminate the administrative boundaries so that all residents and communes become involved together. Central to EGEB's notion of "watershed solidarity" is the idea that solidarity-based water management can help future generations, especially in terms of finding solutions for managing their water sustainably over the long haul. As a result, water is a theme for reflection and action for young people as well, especially since youth and innovation go hand in hand. Young people are constantly inventing and reinventing their own cultures. Hence it is key for the EGEB to integrate systems of expression, exchange, participation and solidarity, because they are strong links for citizenship and at the core of getting the community involved. EGEB's pedagogical work and specific actions, such as "youth parliaments," strengthen the development of democracy while focusing at the same time on new ways of managing water and sharing space.

The EGEB collective includes experts of various stripes, mainly scientists, as well as local partners, citizens, and neophytes who are all interested in getting involved in the watershed management of the area. EGEB thus has the advantage of combining the knowledge of experts and the visions of citizens into a unique hybrid format to understand and challenge water policies in the Brussels region. It uses collective action with regard to water management issues so as to render water a common good. In the process, it explores ways in which the city can combine water and biodiversity in the form of a commons. Its members have come up with several ways to make

this initiative possible. The idea is to find alternative uses for the uncaptured rainwater that would otherwise just inundate the area, such as irrigating gardens and flowering meadows.

The EGEB is committed to a paradigm shift in water management which moves away from the technical-financial paradigm to an ecological and participatory vision. EGEB uses public inquiries into water management to shape public policies in the direction of this paradigm shift, pushing to turn the watershed of Forest into a commons. With its emphasis on collective action and co-production, the EGEB has thus made an important contribution to empowering the commons movement. Its participatory work can be displayed and even formalized through the media so the commons movement expands further. It can also take less visible forms through the multiplication of informal meetings in order to stimulate the action of specific partners. One can see various new inventive forms of collective management being pushed by EGEB.

With the various actors all having the same ideas, a roundtable was organized to discuss how best to launch the initiative. The roundtable was initiated by the regional authorities of the Brussels-Capital Region and the EGEB to reflect collectively on innovative tactics in watershed management in Forest and beyond. Discussions led to a pilot program to test the possibilities of a commons-based governance for Forest and other similar cases. The Forest Commune and EGEB then began a process culminating in the joint production of a roundtable, with commoning tactics put in place to jump-start this vital pilot program.

4.1.3 Commoning as a Driver of Collective Governance

What we have in this case study is a powerful demonstration of what urban commons may be able to accomplish for the resiliency of cities and their social organization in the face of climate change, with an urban watershed becoming a growing threat to increasingly serious flooding of certain densely populated and heavily built-up neighborhoods. Top-down civic-engineering solutions proposed by Brussels' complex water-management administration have mobilized a strong community response searching for an entirely new, more decentralized, multi-faceted, environmentally oriented approach to water collection, distribution, and flows, centered on the notion of "New Urban Rivers." Actualization of such a paradigm shift to water management

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requires citizen mobilization of an action plan which can put that new vision into reality. Once the EGEB was set up, it could organize the steps needed for such a bottom-up alternative with a variety of "commoning" activities building an urban commons, in this case a new vision and system of flood control in cities, from scratch. New open-commons resources in an urban setting require a lot of commoning activity to get off the ground and keep moving on.

4.1.3.1 Assembling Working Groups

The EGEB is made up of several community members and experts, and it carries the vision that 'getting the community involved' will make the implementation of the commons more successful. The EGEB wants to have the citizens become designers and urban engineers of their own watershed. The EGEB pushes for creating New Urban Rivers, designed and implemented by the inhabitants themselves in conjunction with the experts that could help them construct these NURs. As the EGEB implicates itself in the urban planning of the Forest watershed, it has launched several local initiatives to render the neighborhood a source of empowerment for its residents. Principles of getting the community involved include arranging assembled townhall meetings and facilitating leadership. The townhall meetings are in the form of roundtables where citizens organize walks during which they learn about their surrounding environment. Through working groups, the citizens themselves lead the process of organizing promenades and leading discussions of the roundtable. These two aspects are an essential part of commoning in terms of getting the community involved so that they can better understand their neighborhood (the watershed) as a commons.

The role and work of the EGEB corresponds directly to some commoning principles found in the tactical chartering manifesto. The EGEB provides the means of communication between and among residents and other collectives. That communication turns into a dialogue where a multitude of voices are heard. EGEB's organization of working groups within its roundtable addresses the principles of the manifesto dealing with group creation and the division of responsibilities. With guidance from the EGEB, the inhabitants organize these working groups based on distinct skills and responsibilities that allow each working group to take care of a specific objective. Whether they are organizing the walks, animating the discussions within and around working groups, or using platforms to present the inhabitants' work, the working groups follow a clearly defined

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division of responsibilities. In addition, the community is constantly engaged in a conversation on how to set out "New Urban Rivers" or implement alternative devices. Such ongoing community conversation relates directly to the notion of townhall meetings as part of the commoning process. In addition, EGEB has the goal of making sure that such a project is heard in other parts of the world where commons-based watershed management is possible. It is explicit about making sure such projects are possible outside of the Forest boundaries. This coincides with the principle of 'network establishment', where lessons from the Forest watershed can be transmitted to other relevant places, with EGEB actively spreading this type of information around. EGEB wants to create a network of NURs stretching throughout the Brussels region, so the city as a whole develops a commons approach to dealing with its complex water-flow and flooding issues.

The pilot program initiated by the roundtable elaborated commoning tactics. The idea was to allow inhabitants to implicate themselves in the potential governance scheme that would take place in managing the watershed of Forest. The process is twofold. The first part of the process was based on specific educational programs organized by neighborhood committees to learn about the watershed basin and develop a participatory approach on how they might get involved in the planning of the watershed management. The process started with gatherings of inhabitants for exploratory walks in and around the basin (see below for more detail on each of these walks), writing down the results of their findings in collaborative mapping schemes to identify the locations where citizens have the ability to modify water flow and use that water flow for other purposes. The process aimed at developing a study organized and written by the inhabitants to show their collectively elaborated knowledge and pinpoint objectives to professionals working on the issues of inundation in the watershed area. The second part of the process involved organizing a roundtable where these newly skilled inhabitants present their written study to water operators and governmental entities around the issue of water in Brussels (see below). Such government entities include the commune and eventually the region. The other purpose of this roundtable is to develop a long-term relationship with these administrative layers. Such a partnership enables citizen participation in long-term planning for watershed management.

In fact, these exploratory walks, considered a form of commoning, were one of the first major steps in achieving the objectives of a participatory approach to water management of the

watershed, hence a key aspect of the pilot program organized by these various actors. Those exploratory walks were organized by the inhabitants themselves to explore the environment of the Forest watershed, not least to identify problematic or potentially useful locations in implementing NURs or alternative devices. During the second half of 2013 four citizen and expert walks were conducted to create, share, and expand knowledge on the water issues of this watershed area. The walks consisted of inhabitants observing water related problems and finding diagnoses to label these problems, and eventually coming up with solutions to these problems. The solutions would then be proposed to experts during the roundtables after each walk is conducted. The solutions would also be highlighted in a collaborative mapping exercise, using the MapIt platform.

4.1.3.2 Exploratory Walks and Their Mapping

Walk 1: The Shipwreck Walk

The first walk, which participating residents called the Shipwreck Walk, was located in the middle of the Forest watershed, between two railroad tracks covered with concrete, factories, and infrastructure where all the natural spaces, such as ponds, gullies, and white birch, and all of the flora and fauna that used to be there have disappeared, contributing to the volatility of the water flow eventually leading to possible flooding. This destructive imposition of concrete-based infrastructure stemmed from the industrial revolution period of the 19th century when water management was not really a priority.

These urban constructions devastated the natural watershed and led to overflowed sewers gushing out of artificially walled rivers and causing major risk to fragile points of the infrastructure. By analyzing the changing structure of the space and discovering fragile points of the infrastructure, the residents managed to identify the roots of some problems that cause flooding. After the walk, the residents gathered for a few hours for a session of cartography to map out their findings on the MapIt platform. This session also included the presence of water management or geography experts from VUB, UCL, and Montreal universities. The results of this mapping session will be merged with the other MapIt sessions that map out the other walks, aggregating all the data into one single map that is designed to be used for the public debate of water management in Forest.

Walk 2: Head in the Clouds

The second walk was referred to by its participating residents as "Head in the Clouds". The walk took place along the higher points of the watershed, where the water first lands on the watershed and flows downward. These geographical spots can be considered as water run-offs, where the water initiates its flow downward. This walk was interesting, because it showed how water flows from the top parts to the bottom parts which allows some of the problems to be highlighted from this point of view. The location of these run-offs is near the Neptune neighborhood, which is a small residential area at higher altitude near a water source called the "Source du Calvaire" which is the source of several problems of inundations in the lower parts of the Forest commune.

The problems of inundation are brought to the ravines of Parc Duden (inside of the Forest slope) where the water comes down with a certain gravitational force. The participants of this walk noted the lack of reflection by urban planners to ameliorate or contain the force of these waterflows. This omission was not least due to the fact that major urban development projects had initiated construction around the Source du Calvaire, which did nothing to improve water management but instead degraded it. Imposing constructed spaces on river flows, such as this source, degrades the quality of water and harms the possibility for nature to filter or contain the flow of that river, especially since now the water has less filtration spots to escape. This in turn can pose a risk to people living by the source as well. Therefore, the objective of the participants was to find ways of mitigating the furious downward descent of water by looking into building ponds, slow-down devices, or increasing vegetation where water could be stored, diverted, evaporated, or infiltrated. Participants managed to find an example on this walk by observing a pond near the Source du Calvaire which was dug out by local residents to manage water flow better. Other possibilities for such mitigation projects were mapped out on the MapIt platform.

Walk 3: Back to the Sources

The third walk was called "Back to the Sources," and the participants drew some important conclusions for their pilot project here. The walk started from the top of the Cité Messidor (https://www.comitedequartiermessidor.be/?page_id=298), which is an area of development entering the Forest watershed. It contains old waterways that flow into the nearby neighborhoods

known as Vossegatbeek and Zaneek. Several urban planning issues have crystalized here, including the increased development of housing estates and a school, which take up part of the park known as Three Fountains. In this walk residents observed and diagnosed water management on this part of the slope of the watershed. And in this area the presence of water has become a hidden threat. Some of the water streams, identified by residents as gullies, sewers, storm basins, or cellars and ponds, have continuously flooded and have become saturated, only increasing the problem of inundation for neighboring residents. The neighborhoods depend on these streams to manage water and avoid flooding problems. The over-reliance on them has caused a conclusive infrastructure bidding war to put a bandage on top of a bleeding wound, which is insufficient in solving the flooding problem.

The residents have concluded that adding temporary infrastructural solutions will not solve the problem. That approach is a very inefficient dynamic to deal with water management, especially when the threat of flooding is present and getting worse over time. Infrastructure has completely separated the residents from the relationship with water, so knowledge on how to manage water has been lost. And adding infrastructure has only impoverished the biotope that would allow the water to be infiltrated. Other relevant solutions are necessary to revive the element of water, and this should prioritize increasing biodiversity over adding more infrastructure. In the end, some participants have observed aspects of biodiversity that infiltrate water. These observations have been taken into consideration in the MapIt platform, with a strong conclusion that nurseries for aquatic plants should be installed in areas where the water can escape. This would mitigate the risk of flooding in the residential neighborhoods of Cité Messidor, Vossegatbeek, and Zaneek.

Walk 4: Researching the Streams

This walk had the purpose of engaging with the residents in a nearby area of Forest called Senne to engage them directly in the implementation of natural phenomena to control the water flow coming from the slopes. The residents observed some artifacts of what were once constructed waterways that fed fishponds and ended their course in the neighborhood of Senne. Those waterways had been destroyed to make way for development without considering how changes in water flow would impact these residents. The residents also observed traces of the ravines in Forest

Park and the districts downstream containing these ravines. Based on the current situation, the residents concluded that it was necessary to look for natural ways to attenuate the furious descent of the water streams, by reintroducing or rebuilding gullies, ponds, slow-down devices, and vegetation that would allow the water to be stored, diverted, evaporated, and infiltrated in natural ways. These possibilities were highlighted in the MapIt platform. They concluded that such measures could only be taken in an approach that is bottom-up, using participatory action and commoning methods to build these new waterways. In the MapIt platform, they called those devices "New Urban Rivers," which allow for better water flow and prevention of inundation. These propositions were mapped out and then presented to experts and government representatives.

MapIt is a free open-source collaborative mapping tool created by the Social Spaces (KUL) research group based on a kit of intuitive tools, including a system of simple icons and a map of the neighborhood (https:\\mapitgis.com). People can put forward proposals in MapIt concerning the design of public spaces. The use of such a platform allows for collaboration in mapping out and planning out projects, and the open-source nature allows for participants to include or modify nodes of the software and mapping activity. Participants express their thoughts by using icons and stickers that they place on the map. And with each icon and sticker, participants can also express their thoughts for everyone else to see. The icons and stickers are represented by a green light for a positive element, a red light for a problem, and a few dozen other pictograms, notably to symbolize innovative proposals. Such a tool is excellent in the commoning process of mapping out community-based initiatives.

Physical mapping, where residents are given an actual map of the neighborhood (in this case, through MapIt), can be used to figure out boundaries of the shared space, the conditions of the watershed, and which parts of the watershed are needed for preservation or might benefit from serious modification. Mapping out these parts helps residents understand the physical attributes and plan their endeavors in a more effective manner. Physical mapping is also related to the notion of mental mapping, where residents can pinpoint areas likely to benefit from commons-based action. The MapIt process among the residents of Forest following their walks is a good example of how commoners use mapping tools to render a space as a commons. It is an essential part of the

commoning process here. In order for commoners to assess the physical aspect of a commons, they must be able to identify the condition of the watershed. Overall, it is useful for residents to see, identify, and provide input to these sorts of initiatives.

These exploratory walks, the first step in the EGEB-run pilot program, pinpointed specific observations about flooding and troublesome points of poor water management while looking for solutions that were usually natural or sustainable. Such valuable information had to be presented to a broader public, complemented by input of hydrology experts, engineering experts, and political experts all of whom supplied scientific research and expertise. For this purpose, a couple of roundtables were organized to bring together interested parties for discussions how best to design a project that is inventive, transformative, and creative. Their purpose was to develop into a concrete proposal which the working groups of the roundtable would present to water operators, the commune, and other government authorities to see what steps were needed to implement such a project while fostering also longer-term relationships among all these actors. The roundtables were divided into two sessions.

Roundtable #1 on 18 March 2014

The first roundtable in March 2014 had about seventy participants involved, all discussing whether the Forest watershed could be managed as a true commons. This get-together proved to be a defining moment in which regional authorities were able to learn what local inhabitants and community-based organizations were working on together in Forest in terms of envisioning and studying solidarity-based water management. The EGEB, one of the key organizers of this meeting, also provided a common space for debate and discussion. This meeting was co-organized with the "Commune de Forest" municipality, along with other collectives either working on water management or citizens' initiatives. One of the collectives, called "Cellule d'Eau," was especially interested in understanding how municipalities communicate with citizens in dealing with urban issues like water. The discussions during the roundtable were based on hearing out and sharing everyone's' needs, requirements, and practices around water management. The participants were classified into five different groups, among which were residents, water operators, engineers, and developers.

The physical space for this roundtable was specifically chosen so as to immerse the participants in what it would feel like at the bottom of the valley, to accentuate the issues even further and attribute them to the actual situation. EGEB wanted the various speakers to be immersed in the space so as to represent the Forest watershed in as concrete terms as possible. For that purpose five tables were arranged to share experiences – one representing the resident committees, another for working groups of water specialists and officials working for the Commune de Forest municipality, a third table of note-takers and reporters recording all forms of communication during the meeting, a fourth table representing the animators of the meeting, those who took care of the scheduling and lead the activities, finally a table grouping together the experts who weighed in on what was possible for proper citizen-based water management. EGEB described the meeting as a configuration reminiscent of activist-philosopher Bruno Latour's "Parliament of Things" (https://theparliamentofthings.org/parliament-parlement-van-de-dingen-noordzee-ambassade-bruno-latour/) to the extent that the meeting was grouping together humans and non-humans. The non-human "participants" were specified as the slope, the pipes, and the rain.

At the beginning of the meeting everyone introduced themselves and described their profession along with their involvement with issues related to municipal water. Participants in the exploratory walks then showed their findings of the Forest watershed on the MapIt platform and located the findings in specific locations highlighted on the MapIt platform. Presentations were conducted to spur discussion between residents and municipal administrators about the solidarity-based pilot program for water management. When the proposal was finalized during this meeting, all interested parties responded with enthusiasm. Water operators and municipal administrators were both impressed by the amount of work and expertise shared by the residents themselves. According to the EGEB, the work of identifying problematic points for water flow and of seeking active solutions that could be easily mapped out was considered as "very serious and professional." The presence of so many different actors in the same space willing to listen to each other was considered a success in and of itself.

Roundtable #2 on 18 June 2015

The second roundtable in June 2015 brought together more than fifty people at the Ten Weyngaert community center in the Forest watershed. Among the people attending were four regional water operators, seven representatives of the municipality of Forest (including a First Alderman who was the municipal councilor in charge of town planning and the environment), six neighborhood committees representing the interest of residents, academics, collectives of architects and water experts, as well as other representatives of local associations of residents. These people were all assembled by the EGEB and the municipality of Forest to reflect on the possibilities of building and organizing so-called "new urban rivers." The idea of NURs came from a citizen proposal developed during the first roundtable, namely to develop these outdoor roots of rainwater and using alternative devices to control the flow of water heading towards the Senne river. The material forged by the MapIt platforms was also used in this second roundtable to assess the possibilities of those NURs and their paths.

The second roundtable focused in particular on clarifying and assessing two projects. The first was located in the Neptune district where a collective of residents benefitting from financial aid granted within the framework of a call for "Sustainable District" projects had employed a landscape designer to develop a project known as "Green and Blue Flow." Taking advantage of permeable geological layers such as the sands of Brussels, this proposal was presented as a series of small decentralized devices (valleys, roundabouts, feet of floodable trees) that would facilitate the infiltration of rainwater. These devices would protect the downstream of runoff and minimize the loading of the sewer network while bringing a new landscape quality to the district and provide ecosystem services to its residents. This project was presented at the district festival in June 2015. While the First Alderman was impressed by the project's formation, he claimed that the municipality currently lacked the financial and human resources to achieve it.

These two roundtable discussions in 2014/15 did a lot to advance EGEB's agenda of re-imagining water management of the Forest watershed with the help of the expertise from the inhabitants' committees. The second objective was to find an 'experimentation device' around concrete and localized projects within the watershed basin which included developing NURs, modifying water

routes of storm basins, and observing alternative measures of using the extra water from inundations. Operational objectives, defined over a 10- to 20-year period, included increasing the use of local resources from the watershed, reducing wastewater discharge, and limiting the use of drinking water for irrigation purposes. Further work would focus on calculating hydraulic flows, exploring collective forms of governance, and seeking financial resources as well as economic initiatives to treat the water basin. The roundtables had succeeded in proposing a definition of the pilot slope based on its perimeter, its participants, and the functions of the watershed basin. That is where the name "Basin Versant Solidaire de Forest" came from.

The various actors involved have found three layers through which they could define and work together in participatory action on this watershed basin. The first layer was defined as a "natural" layer based on the geological nodes of this watershed, centered on water as its biggest component and categorized in terms of visible water, water that is returned to the sewer, the springs that feed the water flow, the tributaries, and the wetlands that prevent excess amounts of water from flooding the area. A second, socio-historical layer focused on the interaction between humans and nature as it evolved over centuries of settlement by human communities, including villages emerging over time in the area, the abbeys, and the development of economic activities such as village events. This layer also included human efforts to control the water, such as building ponds, canalized spaces, river diversions, and spaces for capturing water all the way to the construction of dikes and slopes. The third layer, known as the 'cultural' or 'civic' layer, identifies the watershed as a space to co-manage among inhabitants and other actors for a more symbiotic relationship between a healthy watershed and its surrounding population, such as launching collective gardens that are part of the whole watershed management program.

In conclusion, it is clear from the two roundtables that the whole experience in trying to turn the Forest watershed into a commons provides solutions for all actors involved with the maintenance of the watershed. The citizens organized neighborhood walks to observe problematic areas and identify areas where construction of an alternative device for water management as solution was possible. These exploratory citizen walks were then mapped out and presented to various actors who have the capabilities to listen and realize this project as a commons. This step-by-step process of promoting walks, drawing up maps, and inventing new consultation mechanisms through these

roundtables shows that the commons has the capability of helping out the neighborhoods, its citizens, and the city's ecology in a participatory manner. The roundtables show a clear depiction of group creation and communication allowing each resident to accept a role or responsibility. These roundtables are a good example of the commoning process fostering dialogue to pursue a common interest and co-produce, or co-organize, towards realization of that common interest.

4.1.3.4 Assessing "New Urban Rivers" (NURs)

When aiming to turn an urban watershed into a commons in order to reduce flooding in an area of rapid urbanization where soils had become waterproofed and thus the cause of major floods, one inevitably arrives at the notion of reinventing waterways where the water flows in a sustainable manner. Such reinvention of waterways is behind the idea of "New Urban Rivers" (NURs) which, reflecting a renewed relationship between the urban dwellers and nature within a densely populated city, aim to reinstate ecological cycles through a new organized system of water management. This concept of NURs is clearly explained and thoroughly analyzed by Valérie Mahaut (2009) and Ananda Kohlbrenner (2015), and the facts discussed in this section come mostly from both of these sources.

NURs are a way to reinvent water patterns and river circulation in a densely urban area. They are designed to reconfigure the city's soil, so that water does get soaked in them, and to reinstall a natural ecological cycle of water flow. NURs also respond to many of the challenges that dense urban areas face when dealing with water pollution and flooding. Much of the excess amount of rainwater comes from the roofs of inhabitants' houses which means that a good deal of the extra water arriving at the watershed comes from private spaces. Instead we could direct that excess water towards water-absorbing constructions such as cisterns, green roofs, and private storm gardens. These spaces can be considered the start or the source of the NUR. The water should then get naturally moved away from public spaces which are subject to inundation. The idea is to lower the amount of water in the public space by diverting it towards the river. Since the sidewalks and roads are waterproofed, they are a major source of inundation. The NURs can provide an alternative path for this otherwise inundated water and give it a place to go. That will allow the roads and sidewalks to have a greater capacity to capture extra water before such excess becomes

a liability for the infrastructure through flooding. Even water getting pumped from springs or from the metro can find its space on the surface of the roads, because the NURs allow for greater capacity. During thunderstorms, excess water will go directly into the NURs, containing, and hopefully even preventing, flashfloods.

All the rainwater and runoff found in public spaces, like streets and squares, should be managed directly on the surface without being redirected to the sewers. This phenomenon of managing water directly at the surface through NURs would constitute an original way of creating a separate network where existing sewers would keep functioning without being overburdened by storm water. The NURs would take their place on the surface, carefully avoiding any pipes and keeping the existing infrastructure safe from dangerous floods.

The complexities of redirecting water flows through NURs to reduce sewer congestion and overflows can be seen clearly by what happened to one of the local water-management projects known as "Sources of Calvary and Laybeek." This project, an outgrowth of the community work done on creating a commons-based Forest watershed, has been pushed by the Bervoets and VanTropDel neighborhood committees. Its aim is to enhance two small streams currently connected to the sewer extended towards the Senne river by having sources of rainwater captured by NURs to relieve congestion pressures on the sewer system while at the same time also improving the purification efficiency of treatment plants. Stretching from the original sources of overflows all the way to the Senne, the routes of these NURs would cross several lots that are currently available for real estate projects and thus potentially getting preyed upon by private developers. Those might be a serious deterrence for the NURs to be constructed. That is why the EGEB and the Forest committees invited five promoters of various real-estate projects located on the trajectory of these NURs from upstream to downstream. The promoters then ended up discussing with water operators what options and sections were possible to construct those NURs. The municipal planning department and Infrabel, the manager of railway infrastructure, were also involved. The objective was to discuss, section by section, the problems and opportunities linked to the realization of these NURs. It was collectively agreed that NURs would add land value to the several lots because of the increased biodiversity and other ecosystem services that they would

offer to the area. Consensus was reached by the end of the meeting, showing the success of these kinds of roundtables to achieve their objectives.

But NURs are difficult to construct individually and also have to be looked at together in their inter-connectivity. The topography of the slopes of the watershed creates obstacles for the water paths of NURs. Spatial devices are required to slow down the water flow. Such spatial devices like ponds, parks, thunderstorm gardens, submersible places, roundabouts for water storage, and medians transformed into valleys have to be considered. Even though much of the watershed has been waterproofed by sidewalks, many of the spaces can be made available by transforming them into storm gardens. Studies conducted by the citizens and experts have identified numerous potential spots. With those spaces included, the NURs can turn into a network that connects the water flow to these various thunderstorm gardens, gutters, weirs, basins, cisterns, valleys, and any alternative system capable of avoiding discharge into the sewer. These gardens can be considered as alternative devices and spaces that define the shape and water flow of the NURs.

It is important to identify these alternative devices for NURs. According to the "Actes de Naissance" document created by the ensemble of various actors in the commons-based watershed basin of Forest (see section 4.1.4), thunderstorm gardens are "…green spaces, basins or slightly steep squares with areas ranging from large squares to a few square meters." Arranged in a garden, a roundabout or a solid ground, they fulfill an identical primary function: "to allow rainwater to be collected in individual or collective tanks, in the ground and its vegetal cover, to circulate as closely as possible to its place of precipitation, in (creative) gullies and fountains, with the possibility of accumulating in infiltration basins or dry basins, valleys or absorbent lawn ditches, or in vertical gardens, to overflow there and then seep into the ground or evaporate." Thunderstorm gardens provide a lot of ecosystem services to a local urban area. First of all, they reduce major urban heat, because they provide natural pockets in which the heat is absorbed. They also facilitate the flow of rainwater by linking with basins, cisterns, valleys, and ditches to form a real hydraulic network. They are attached to the NURs to ensure that the water flows away from impermeable surfaces. Besides adding to plant and animal biodiversity in the heart of the city, they help to enhance the neighborhoods where they are located. At the same time, they provide a new level of conviviality

and can even foster social ties by serving as play areas and places for strolling conducive to discussion and meeting.

All these water-absorbing and -slowing devices aggregate into a 'surface mesh' that can follow the topography and layout of the streets, squares, and parks. The collectives organizing the roundtables call it a "mesh of new urban rivers". That network of NURs allows the water to flow slowly from alternative space to alternative space towards a water-collections and -storing space at the bottom of the valley. This system can transform the way rainwater management facilities filter the water, but that depends on the quality of the soil. The idea is to make sure that the water is infiltrated at the surface level as soon as possible. These aforementioned alternative spaces can guarantee the quality of the infiltrated water and the preservation of groundwater and soil from any pollution that accumulated into the watershed itself. The NURs can then take the form of a tributary for the Senne river, while making sure that some of the extra water is infiltrated into these alternative spaces and disappears from the ground, limiting the amount of water that ends up in the Senne river. Water infiltration should mainly be distributed over the surface of natural storm basins to avoid problems with soil proliferation and excessive water pressure. The concept of NURs designed by the citizens has taken such distribution into consideration. This requires a multiplication of those alternative devices. Such devices can be constructed at the level of streets as well as at the site of a parking space which could be sacrificed for the benefit of an "infiltrating chasm," an "infiltration field."

To the extent that these alternative devices are located on the street level, they can help the development of needed resources for the neighborhood, such as benches, special plantations, or adapted bicycle parking spaces, as long as those additions do not interfere with the infiltration of water. Moreover, it is important that the paths guiding the water towards these infiltration spaces are visible and perceptible to all in order to guarantee that the community appreciates their presence and grasps their territorial dimension. In order to manage rainwater effectively, this water must be retained in spaces provided for this purpose, such as planted, mineralized or mixed storm gardens, taking into account the various uses of public spaces. Successful NURs make water flow at a more measured pace, an especially useful feature during thunderstorm events.

Concerning both the Maelbeek and Forest watersheds, the NURs proposed have two different forms based on the quality of the soil and the level of the topography. Upstream, the soil line of the natural basins would have the NURs look like a bunch of small-sized tributaries which are defined by the surface and continue their course in the underground aquifers. Downstream, where this line is more exposed to unfilterable soil, the NURs would form a continuous grid and allow the water to travel towards the Senne river at a slower and more manageable pace. These NUR forms depend on their location in the geological landscape, with the water paths depending on the slope of the streets. These two NUR forms, one engaging water in an underground cycle and the other approaching the lower portions of the watershed in a surface cycle promoting evaporation and evapotranspiration, would slowly guide the water flow towards the Senne.

Such a new vision of rain water management will require all the involved actors to work together to make this possible. Those actors include the local authorities of the "communes" (e.g. Forest), the regional authorities, the Environment and Energy Agency of the Brussels-Capital Region known as Bruxelles Environnement (or IGBE), the region's public transport company known as STIB, the public water company Vivaqua, the various neighborhood associations led by EGEB, various experts, and activist residents, all acting as stakeholders with their own interests and expertise combining to co-produce and -manage the watershed as a commons. These actors have shown an ability to have a forward-thinking discussion and have introduced measures for possible collaboration through the roundtables. But these NURs also need legal capacity through contracts and financing.

The search for agreement between the various actors has generated different articulations of engagement. Take for example the path-breaking work by the Eau Water Zone collective (https://www.ieb.be/-Eau-Water-Zone-) in defining this brand-new commons-based concept of "new urban rivers." EWZ organized roundtables in the course of which the concept of the NURs came to be accepted in principle by the local authorities as a very innovative idea to engage and empower citizens in water management. Those roundtables were followed by an exhibition called "Water and us: the case of the Maelbeek watershed" as part of a multiple-event program entitled "Ten days to irrigate the future" and associated with a larger exhibition called "Open Source," also organized by Eau Water Zone. The collective then proposed a legal mechanism to engage the

authorities aimed at materializing this citizen-based project for the construction of NURs in the form of a charter known as the "Charter of the New Rivers of Maelbeek." The idea is to engage in dialogue with competent local and regional authorities and push negotiations for proper management of the river toward administrative commitments crystallized in so-called "new urban rivers contract" as a method of proposing alternative choices to the municipality.

A collective known as BrusSEau (for Brussel sensible à l'eau; https://brusseau.be), which includes EGEB as well as various experts on urban water management from local universities and research institutes, has analyzed the potential of NURs for flood control in the Brussels region. The BrusSEau collective has also launched educational exhibits to that effect (http://www.habitatetrenovation.be/expo-brusseau-bruxelles-sensible-a-leau/). Its research has shown that the hydrological potential of NURs in the area is very large, with almost 30,000 m3 of water potentially diverted from the sewers. Areas where NURs would logically be most likely installed tend to be preferential zones for the infiltration and evaporation of water, which the MapIt exercises of the residents have confirmed. While there are good intentions between the private, public and civil society sectors in developing NURs in coming years, sources of funding for their construction and maintenance remain an issue. It is worth noting that the BrusSEau collective has recently begun to make its case to multilateral and international organizations potentially able and willing to provide funding support for NURs, as can be seen from the report of Dimitri Crespin (2020) to the Organisation of Economic Co-operation and Development.

4.1.4 The Charter - EGEB's Actes de Naissance

The idea of rendering the Forest watershed into a commons has inspired academic experts of commons, such as Pierre Dardot and Christian Laval (2014). While these authors think of the commons as a form of action, EGEB and the neighborhood committees continue to experiment with new collective practices relating to the creation of NURs. In line with Dardot and Laval presenting the commons as a political principle requiring construction of spaces of collaboration and co-decision, the EGEB and the Municipality of Forest have organized roundtables where a large number of actors were able to discuss and experiment with the notion of NURs to render the Forest watershed into a form of shared collective governance that is quintessential to the theory of

the commons. Dardot and Laval maintain that the commons can only emerge from one establishing practice, developing new reciprocal rights and duties which guarantee its uses and sustainability. We have also found in this case study that the commoning processes of walking, mapping, and discussing the findings and possibilities through the roundtables ensure the establishment of new and lasting relationships between the different stakeholders within the Forest watershed. This process is further confirmed by the creation of the "Actes de Naissance" as a legal document furthering the goal of organizing the Forest watershed as a commons (https://www.egeb-sgwb.be/article335.html).

The purpose of this document, which literally means "birth certificate" and was decided upon during the first roundtable of March 2014, was to illustrate to authorities and other potential partners how the watershed-as-commons project evolved step by step from the beginning. It is similar to a charter in terms of explaining a process, setting up rules, and defining objectives in writing. The document describes the commoning processes, from the walks and roundtables all the way to the MapIt presentations, and assesses the possibilities of introducing NURs and alternative water devices in strategic spaces of the watershed area. These acts of commoning capture the general process of rendering the watershed into a commons. The document highlights acts of co-production between various actors, the discussions that have taken place among actors, and the forms of shared governance in managing the commoning activities and eventually the commons itself.

The document's general introduction explains what the watershed is and the challenges residents face while living in this watershed, particularly with regards to the threat of recurrent floods. It then lays out arguments in favor of an alternative form of management to make this watershed sustainable, thus presenting the context for a commons-based watershed, where citizens gain knowledge and eventually become empowered to have a voice in how this watershed can and should be managed. This introduction is followed by a section detailing how local residents, together with the EGEB, organized four exploratory walks (see the first half of sub-section 4.1.3.2 above) to identify specific points where water escapes and floods tend to originate, while also identifying possible areas where alternative devices can be installed to slow the water flow or soak the water into the ground in natural and self-infiltrating ways. This section also showed how all of

these identifications were thoroughly mapped out in a mapping platform called MapIt in a very intuitive and visibly understandable manner, followed by a display of the maps.

The sophisticated use of this mapping platform allowed systematic detailing of all the aspects of this commons-based "Bassin Versant Solidaire de Forest" water-management project. Organized as a group exercise, mapping became a crucial aspect of commoning to plan this unique urban-commons project in a collective manner. The MapIt kit chosen for Forest allowed for the placement of self-adhesive, differently colored and shaped icons each of which had a specific meaning. The placement of the icons on the map was the job of discussion groups made up of a maximum of eight participants that met around a table, with a moderator leading the group to ensure all icons were correctly chosen and placed. When a group finished mapping, its members selected someone to present the work to the other groups. Each group showed its set of icons with different colors so that the other groups could view the results of the discussion among the members of this or that table.

All of the work from the four collaborative walks and maps were presented in this second section of EGEB's "Actes de Naissance" document in the form of a "MapIt summary card." The summary included current findings divided into positive or negative elements, and the causes of those elements. This was followed by proposals how to limit the risk of flooding, how to limit wastewater discharges, or how to find new uses of water as a resource (like using it as an irrigator for community gardens, for example). Indicated too on the MapIt platform were types of action, such as areas of soil infiltration, waterproofing, evapotranspiration, increased vegetation, areas of slowing down waterflow, increasing water storage, revitalizing old structures, increasing heritage, linking alternative devices together through new urban rivers, and creating sources of added value to the neighborhood that are natural and helpful to the water management of the watershed. Finally, the maps showed levels of priorities concerning these proposals for action, depending on risks as well as the capacity of the means available to implement them.

The third section of the document looked at the strategies undertaken by the working groups, committees, collectives, and cooperatives with regard to different forms of water management in specific areas of the Forest commune. Those various actors organized themselves into specific

working groups, based on the task or the area of that task. A lot of their projects were done in common with other partnerships, including the Commune of Forest and an initiative known as the "Cellule d'Eau." This initiative was born out of a need for a service of the municipal administration coordinating actions across the whole of the Commune. The establishment of the initiative "Cellule d'Eau" aimed at a global and integrated vision of water management. Each department (town planning, roads, environment, buildings, etc.) ended up taking part in addressing this problem. Seeing how all these actors coordinated together through working groups for solidarity management of the watershed, we can take a look at the specific projects where all the different actors worked together to improve the conditions of the watershed.

Among the projects discussed in this third section, for example, was a project conducted by Hydrobru and Vivaqua in the Baek-Merrill district to implement a storm basin. Both of these water utilities are 100% publicly owned companies in charge of providing water to households at a government subsidized fee. Their project, based on the support of certain companies around the Jacques Brel Park, will help monitor water flow and water quality in the area. The Jacques Brel Park is a target for numerous projects in water management. Following a Beliris study, one of the priorities concerned the rehabilitation of the hydraulic network. In addition to useful renovations, the main idea was to use the ponds as natural storm basins, thanks to the recovery of rainwater from neighboring companies. The implementation of the project required sustained collaboration with the Municipality ("Commune") of Uccle and consultation with the companies concerned. The project is mentioned here, because it can synchronize with various other initiatives taking place in the area for construction of the watershed commons.

In the Saint-Denis district Vivaqua has installed piezometers in partnership with the Municipality of Forest. This project is conducted in conjunction with a hydrogeological study concerning water tables. In the project, implementation of by-passes to the storm basin was also taking place. This forged into a study conducted by the Brussels Society of Water Management (SBGB) on the "Anciens Etangs" by-pass along with the renovation of numerous collectors and biennial cleaning campaigns by Vivaqua. In addition, there is the renovation of the Forest park sites by the public-infrastructure collective called Beliris (https://www.beliris.be). A third of the budget was earmarked for management of the park's waters. This renovation will include the timing and

infiltration of runoff water via buried structures. Part of the site (current sandy arena) will also be renovated in order to collect and delay rainwater and naturally infiltrate it. Several other projects were based on analyses by several working groups to see what was feasible in the Forest area, triggering important discussions between different actors on how best to implement these projects for proper water management.

All these projects mentioned in the third section showed the need for citizen participation in water management. Governance has a huge role to play, especially in the Forest area. Water management was historically a communal matter, with each municipality managing its own drainage network. But that has changed over time. While the Communes are still the owners of the network, the network has centralized and has delegated its management to Hydrobru which, together with Vivaqua, manages the entire water system of the Brussels region, along with the inter-municipal associations. Historically speaking, the communes had a difficult time managing water at the communal level. When major maintenance was required, it was often too expensive to undertake. Today, the drainage network is inherited from municipal management throughout the Brussels Region, but as stated in this section of the "Actes de Naissance", it is in fairly poor condition. In any case, the Communes have joined forces to pool their resources in inter-municipal management which resulted in today's inter-communal Hydrobru and Vivaqua utilities. In doing so, the Communes move away from water management and their own responsibilities through a system of representation and delegation. This form of delegation was further reinforced with the rise of the regional government. Certain tools at the ground level were then used to obtain solutions in water management, allowing water governance to advance further from the purely municipal level. This regional arrangement was only possible as long as rainwater was perceived as a disposable element. Now that the times have changed, this section mentioned how imperative it is to have a different approach like the one presented in this watershed project.

The fourth section of "Actes de Naissance" focused on the roundtables, explaining how they were introduced as a mechanism of coordination. Because there were so many different actors, there had to be a group of note-takers writing down all of what was discussed. The notes were organized to illustrate how the various actors came up with ideas and collectively agreed with each other on how this project should be conducted. The key thing to take away from this section is the possibility

to install New Urban Rivers, a concept invented and physically created by the citizens to manage water flow and avoid the floods. Those NURs are what the physical commons is within the watershed, while all the actions of mapping and discussing in roundtables can be considered the commoning processes giving birth to the physical commons.

The fifth section is dedicated to the modalities of monitoring the current state of all the active projects discussed in the third section which are designed to render this watershed a commons. Such monitoring requires diagnoses based on data-driven evaluation of progress. The creation of project sheets calls for the creation of a database. In this section, there is an explanation on how data sheets were forged by various actors to understand the current state of the projects. This section also explains why the best way to present this type of information would be on a platform combining a geo-located and collaborative format. Each collective carrying out a given project would have to manage its own project file by having access to the platform. The construction of such a database could accompany the construction of each project while integrating calculations of incoming and outgoing water flows, a crucial data point when trying to figure out how best to slow down inundations in the area.

The last two sections at the end look at the long-term conditions helpful to the realization of the water-management projects being planned. The differences of interests between actors are highlighted while finding forms of convergence that can ultimately make the project work. In that context, there is also a useful discussion of important lessons to be grasped from the different commoning experiences such as walks, mapping, roundtables. Several questions are presented to earmark the next steps to take in the commoning process. Near the end of the document there is also a proposal to form a specific organizational chart in a coordination platform that should be made available to all actors of the region. The Regional Coordination Platform is used for the implementation of water policy and how the commons fits into it. Several articles are presented here to make this coordination platform work for everyone, especially so that there are specific generally agreed rules to follow when the watershed becomes a commons.

This final section examines the legal basis for the "Bassin Versant Solidaire" urban-commons project in Forest by identifying specific regulations promoting the sustainability of water

management and policy in Brussels. The commons-based project will after all need to pass the legality test for approval by the competent government authorities. Most relevant articles come from the "Decree of the Government of the Brussels-Capital Region coordinating the public service missions of operators and actors in the implementation of water policy and establishing a committee of water users." Its Article 3 specifies as policy objectives to: "... reduce pollution in surface water, groundwater and protected areas, … the treatment of urban waste water; …. quantitatively restore the hydrographic network and reintegrate water into the living environment." The actions of coordination must "…apply the principle of recovering the costs of services linked to the use of water… promote the sustainable use of water; …conduct an active policy of preventing rain floods; …promote the production of renewable energy from water and underground while protecting the resource." All of the commoning actions taken by the various actors correspond exactly to this article, including the NURs as tools preventing the overflowing of water, which in turn is designed to prevent floods. Article 4 covers aforementioned actions of commoning for the operational planning and monitoring of the commons-based management of the watershed by stating that "…the coordination platform has the mission to: - ensure preparation, operational planning and monitoring of water policy; - to coordinate the carrying out of the missions and activities integrated within the framework of the water policy; - to inform the Minister of the implementation of this coordination." Finally, the decree's Article 7 provides for a broad-based coalition of cooperating actors, including citizen-based groups, by stating that: "…the coordination platform may invite ad hoc working groups and watershed committees: - any person of public law such as: the municipality or municipalities located in the watershed concerned; or the Port of Brussels, other regional administrations likely to be directly or indirectly affected...; - any natural or legal person of private law who can justify an interest in the water sector such as associations having the environment or the water cycle in their social object, local associations (defense of interests local), businesses, self-producers, citizens; - any scientific or academic expert; - any public entity belonging to one of the two other regions with an interest." All these articles allow the Forest project to exist, which is why the "Actes de Naissance" serves as a jurisdictional tool to validate the actions of commoning as legal and make the commons exist within the water-policy framework of the Brussels region.

In conclusion, the "Actes de Naissance" document is used to present a new way of managing water in Brussels by analyzing in detail a local pilot project for a solidarity-based watershed commons in the city's southern Forest district. It sheds light on all the steps of commoning that makes this pilot project one of general interest and one of co-production between various actors. The aim of this document was to present water as a common good and reintegrate the functions of its management beyond prevailing administrative borders to involve more actors, not least of which the local residents standing to be more affected by it. This document can therefore be used to advance policy measures in the future that allow watersheds to be managed as a commons. When looking at all the steps of the commoning process, they clearly correspond to the processes found in our analyses of tactical charters (in section 3.3.2). In this context, we can also confirm the creation of the "Actes de Naissance" as an excellent case study of writing tactical charters as itself an act of commoning.

This case study lays out how much turning the Forest watershed into a commons matches the principles for urban commons creating "transitional urban resources" which I have tried to develop in this thesis. These principles crystallize in our case study here around such acts of commoning as conducting walks of exploration and education, mapping out the findings in the MapIt platform, discussing the findings and how they correspond to the objectives of the pilot project, and presenting this work to various actors representing government, water operators, and municipalities. The result of such actions of commoning is the possible implementation of "New Urban Rivers" (NURs), a true innovation in the way we manage watersheds for ecological purposes and problem-solving tactics against the threats of inundation. It becomes clear that the commons-based project of the Forest watershed is a very appropriate example of the commoning process and the value a commons can bring to an entire urban territorial area. EGEB's role in assembling local residents, along with various actors, is not only an example of getting the community involved in the commoning process, but also of making sure that the community engages in dialogue with a municipality.

The question now is whether this project is seeing any success as an urban commons. As we have learned in the radio emission, the project is stalled and there has not been a sign of implementing these NURs physically yet. It seems as though the government is very reluctant to take this path

mainly for political reasons, but also because they believe such a project is not financially viable, as evidenced by Vivaqua's assessment of NURs. The project sees success in changing the debate about how inhabitants should relate to their geographical area, especially with water. The proposal of NURs is very well documented at this point, and it is being used elsewhere. In many ways, we can look at this Forest watershed project as a project of experimentation, where lessons were learned which could be exported to other urban areas where such challenges existed as well. Climate change will make urban flooding one of its recurrent threats likely to get worse in my cities of the world. That is what makes the case study of the Forest watershed so valuable when analyzing the commoning process of the commons itself. In any case, the debate is not over, and Brussels has fundamentally changed the debate over how water should be managed ever since this pilot project took place. The process of rendering the watershed a commons looks like a promising alternative should Brussels revisit the notion of solidarity-based watershed and water management. We can therefore already highlight here the success in terms of changing the political realm through the experiences lived in this case study.

Section 4.2. Case Study #2: Agrocité

This second section will present the second case study, called Agrocité. We will go over all the details regarding this case study, including background information, the community, their governance structures, commoning tactics, and their charter, which covers all of this information. The charter is found in the REMIX the Commons platform.

4.2.1 The Nature of the Resource as a Commons

Unlike the example of the watershed, the concept of the urban farm, like the Agrocité project I shall present here as my second case-study, is a constructed commons from the ground up. There is no transformation process of turning a natural area into a commons. Instead we have a process where the commons is created from scratch through the process of commoning, a process which, among other activities worth highlighting, involves occupation of a physical space, once abandoned and neglected, and turning it into a space of transformation that is entirely set out by the community itself.

Urban farms as commons can be defined as shared spaces or shared resources in an urban setting where a defined community has the autonomy and the self-developed tools to implement collective governance, corresponding to the governance schemes presented in Ostrom's work on the commons but adapted to the specific challenges of creating transitional urban resources as urban commons. Such an institutional arrangement for a TUR aims to manage an urban commons space in an ecologically sound manner. Urban farms are a relatively frequent form of urban commons, often located in spaces that used to be abandoned or had been underutilized. When organized as a collectively shared and managed commons, they provide plenty of opportunities for nearby residents, especially those that are marginalized. There is greater access to fresh alimentary products while also helping the neighborhood pursue a locally grounded ecological transition.

As an urban commons, urban farms also contribute to key environmental initiatives which cities need to adapt to climate change. For example, Agrocité has a hydroponic vertical farming initiative, which uses techniques of water management allowing a system of filtration to take place on site. With hydroponics on site, neither a drainage system nor water replacement system are necessary anymore, and the operation occurs in a closed cycle. With a biological filter installed on the water's path, the water is filled with nutrients feeding the plants. In addition, a geothermal heating system is installed from composting. It recovers and reuses thermal energy produced by the compost where temperatures can reach up to 60 degrees Celsius. The system is used to heat all the buildings during winter season. All of these ecological initiatives contribute to the urban commons and its quest to render neighborhoods more sustainable and adaptable to climate change issues. Urban commons must have a focus on ecological initiatives such as this one, if they are to become key players in mitigating climate change effects in cities. Agrocité serves as a perfect example of that.

4.2.1.1 The Urban Resiliency Farm

Agrocité de Gennevilliers is an urban resiliency farm with a heavy focus on ecological benefits and specializing in developing urban agriculture while accompanying cultural and educational activities. What Agrocité represents as a commons relates to urban farming or, more broadly

defined, to urban resiliency. Katherine Brown and Anne Carter (2003) from the U.S. non-profit Community Food Security Coalition, also quoted by Chiara Tornaghi (2014), have defined urban agriculture as the process of "the growing, processing, and distribution of food and other products through intensive plant cultivation and animal husbandry in and around cities" (ibid., 3). Such a broad definition allows urban agriculture to be interpreted in various ways. Its general aim is to contribute to overall food security, particularly in densely populated areas of the world, and provide the poorest tiers of the population access to food. In turn, it also provides natural spaces in dense urban areas where green spaces are scarce. Ségolène Darly and Kaduna-Éve Demailly (2017) make a key distinction between urban agriculture in a neoliberal mindset and urban agriculture to combat or challenge the neoliberal mindset. Some urban farms, for example, represent the neoliberal model of producing goods that are then later sold at a market or are used to raise the market value of nearby properties. A clear example of this are the hydroponic gardens in the rooftops of Brooklyn. By contrast, urban agriculture may also occupy non-developed or underdeveloped land as a form of resistance to rapid urban development. Kristin Reynolds (2015) describes urban agriculture as a space for socio-political change, or as a space where marginalized populations gain control over their own access to food. The definition of Reynolds fits very well with the urban agriculture model of Agrocité, and grasping the purpose and objectives of Agrocité within this alternative framework enables us to view it as a commons.

Urban farms can take a variety of forms, and the element of resilience may change the way the farm functions in a city. That is why it is important to include urban resiliency management as a key aspect of urban farming when defining urban agriculture. Resilience implies building or constructing a farm to make communities more capable of self-sufficiency and self-adaptability. Johan Colding and Stephan Bartel (2013) state that urban resiliency management involves a management process in cities based on the capacity to resist or adapt to changes in the surrounding urban environment or neighborhood while still maintaining its function and structure. This characteristic allows urban farms to self-organize autonomously yet build or increase capacity for learning and adaptation, which in turn makes the community managing these urban farms more successful and robust. Such self-management and co-production by the farm's users make this perspective of urban farming similar to the whole idea of urban commons, as we shall be able to demonstrate with our analysis of Agrocité.

4.2.1.2. Geographical Location

The subject of this case study is Agrocité, an urban commons in the form of a community garden in Gennevilliers, northwest of Paris. This common space has been created by citizen mobilization to propose co-managed solutions under the direction of the urban-transformation collective Atelier d'Architecture Autogérée (AAA, https://www.urbantactics.org). Above all, Agrocité is both an agricultural and a cultural site. It includes an experimental micro-farm, community gardens, educational and cultural spaces, and a whole host of experimental devices such as heating from compost, rainwater collection, solar energy production, a hydroponic horticulture system, and phytoremediation. It is a place designed to develop urban agriculture and to foster cultural as well as educational activities.

The site is created through a commoning process whereby residents participate in the management of the Agrocité. They collectively decide how to use the space, especially as concerns water use and the resources of sorting, energy, and heating. The case study presented here analyzes all the various steps which residents have taken to make the Agrocité space ecological and self-sufficient. These steps provide good examples of commoning activity, such as mobilization of inhabitants, allocation of responsibilities, meetings on site, dialogues and co-projects with the mayor of Gennevilliers, selling food in a solidarity market, and other resource mobilization activities relating to the "Social and Solidarity Economy." It is worth noting here that Agrocité is part of a broader SSE network of activities and actors built by the AAA collective which its leaders Constantin Petcou and Doina Petrescu (2015) have named and discussed as R-URBAN (see r-urban.net).

4.2.1.3. Historical Background: The Problem of Local Politics

R-Urban was initially implemented in Colombes in 2011, a large northwestern suburb of Paris with 84,000 residents about 10 kilometers away from the city center. Colombes was the chosen place, because vacant abandoned land was rampant there while much of the local population was also subject to social exclusion, academic failure, rampant unemployment, xenophobia, and criminality. There has been a lot of institutional neglect in the area, with some spaces in very poor

condition and remaining abandoned for years. A lot of these spaces were made available by the mayor of Colombes at the time to several local initiatives. Inhabitants responded to this trend by mapping out specific areas of abandonment and neglect where the city of Colombes was the only property owner. After mapping out these specific areas, the members of AAA, the inhabitants, and activists decided that it would be best to try the R-Urban initiative in Colombes. R-Urban was able to mobilize partners to join and be a part of the construction process. There was also increased support for the project by the municipality. As a result, R-Urban received funding from the town of Colombes, the Hauts-de-Seine Department, the Ile-de-France Region, Europe and foundations. In 2011, the R-Urban initiative also received a grant from the European Union's LIFE programme for environmental management and climate action, for a sum of one and a half million euros. That grant allowed planning for the creation of three self-managed community facilities, aiming at the social, economic and ecological transformation of the Colombes neighborhood. Agrocité was one of those three facilities to be built in Colombes.

One of R-Urban's key goals is to develop urban farms as commons by transforming vacant spaces that serve no purpose actually. To ensure this policy in practice, R-Urban defines necessary prerequisites for rendering spaces into a commons in the form of an urban farm devoted to resiliency and community empowerment. Of crucial importance in this regard is committing to a bottom-up participatory approach where inhabitants determine collectively how the space will be occupied and then managed. In that way, they can give themselves the tools needed and develop the shared space according to their needs and desires. This participatory approach can always be strengthened by learning and using new ecological practices. Given the general lack of investment for these types of initiatives, active local participation puts more pressure on government to direct the appropriation of the city's development towards the community itself.

The operation of Agrocité was made possible by the voluntary work of the inhabitants, the AAA team, and other European partners. In view of the success Agrocité was bringing to the neighborhood, the local authorities then committed to finance the project over a period of four years, while also being the principal owner of Agrocité's land in Colombes. The property was made available by the town of Colombes to Agrocité through an annually renewable and free lease, allowing Agrocité to use the land with a certain degree of freedom. The first phase of the R-Urban

project incorporated two projects, Agrocité and RecycLab, and brought them rapidly to full fruition. The original Agrocité project in Colombes was considered an instant success in mobilizing inhabitants to perform ecological tasks while becoming autonomous in securing its own food supplies. By 2015 a total of 400 members had gotten involved in the project which at that point even employed a full-time market gardener in charge of the upkeep of the garden. Agrocité occupied 3,000 square meters of space, between two low-income housing estates. The ground was also decontaminated by residents using a technique known as bioremediation, a process by which biological micro-organisms break down and consume pollutants. And members of Agrocité also experimented with aquaculture, the cultivation of aquatic plants, including hydroponics.

The municipal elections of April 2014 ended the Socialists' control of Colombes, electing instead the center-right politician Nicole Goueta to become the new mayor. She was less favorably inclined to support not-for-profit initiatives and help poorer communities. She also wanted public spaces used for traditional urban construction projects. Right away she blocked the additional urban-resilience projects planned by the R-Urban initiative, EcoHab, which was supposed to have been the third R-Urban pillar in Colombes and had gotten off to a slower start than Agrocité and RecycLab. And then, a year into her reign, the mayor of Colombes decided to dismantle Agrocité in order to construct a car park. Besides arguing that there was not enough available parking space for families to park their cars, Mayor Goueta also claimed that a car park would bring back funds to the government because parking space is more profitable than urban resiliency farming. Activists, collectives, and inhabitants opposed this decision. They organized demonstrations in front of City Hall and had petitions signed. But the protests did not cause the local government to change its decision. Because of these unfavorable developments, R-Urban decided to move to Gennevilliers in 2018.

Gennevilliers is a northwestern suburban town of circa 50,000 inhabitants, located about nine kilometers from the center of Paris, with excellent access to the public transport network. The topography is relatively flat. Bordered both in the north and the south by the Seine river, the industrial suburb is served by the metro line 13 as well as the suburban RER trains, making it a convenient location with direct access to the city center of Paris. Gennevilliers contains five

distinct districts. The Agnettes district, where Agrocité is situated, experienced a full expansion of industrial development during the 1960s and 1970s, along with many other suburbs in Paris. But that industrial center eventually became increasingly abandoned as its industries were becoming gradually more obsolete over time. That means there are a lot of brownfield sites available for development.

Today the district is one of the centers where a vast project of urban renewal under the auspices of France's National Agency for Urban Renewal (Agence National pour la Rénovation Urbaine, ANRU) has been launched over the last decade. This qualification implies that Agnettes will be a micro-center within the Grand Paris network which allows for increased urban development. But this qualification also requires that development to become a new eco-neighborhood providing innovative housing, smart resource management, recycling circuits, and infrastructure which increases residents' access to shared mobility. As part of a comprehensive urban development plan, recent construction projects have included a new city hall, a 19-floor administrative tower, the central Rabelais library, the village hall, and a shopping center. In 2015 the Edgar Varèse Conservatory of Music was completely rehabilitated, expanding its capacity to 1,500 students and 45 rooms which include several studios. All this work is part of a more global approach to create an identified city center.

The population of Gennevilliers is mostly working class, offering lower-income households access to affordable public housing. There remains a risk that the city becomes gentrified due to its location, and many working-class families are worried that they will be eventually pushed out. But so far, the municipality of Gennevilliers, long a bastion of the French Communist Party, has provided greater support to initiatives favoring the livelihoods of working-class families and implementing more ecologically-sound community gardens in spaces that were available. When Agrocité moved to Gennevilliers in 2018, the local government there helped in organizing its inauguration in the district of Agnettes. The mayor Patrice Leclerc (PCF), who was first elected in 2014, has been trying to institute policies which shield residents from gentrification while also protecting their social welfare. One of the policies having proven successful in empowering marginalized populations in the area is supporting Agrocité and its various partners. The frustration

arising from the closure in Colombes allowed this new version of the project to gain more support from residents in its new location.

Today, other municipalities are following Gennevilliers' lead in supporting the Agrocité project. In 2019 another Agrocité was inaugurated in Bagneux (https://www.bagneux92.fr/agenda/284-atelier-agrocite), another suburban town about seven kilometers south of the city center of Paris. Another collective known as Archikubik has recently launched a similar urban farming project, the Agrocité Gagarine Truillot (see https://archikubik.com/projets/agrocite-gagarine-truillot/), in the southern suburb Ivry-sur-Seine. For the future, another Agrocité is planned for Montreuil, which is one of the most densely populated suburbs on the eastern edge of Paris right across the Péripherique (the ring road surrounding Paris). This trend indicates that Agrocité has a very bright future ahead in the region as Greater Paris plans to support more community-based ecological initiatives like this one.

4.2.1.4 The Commons Approach as a Solution

Agrocité is self-managed by local residents. The site itself occupies 3000 square meters of land that was once a parking lot between large buildings of public housing, in a housing estate called Cité des Agnettes. Its official address is 16 rue des Agnettes. The site includes several smaller lots, including an experimental micro-farm where crops and produce are grown collectively, community gardens, and a wooden structure that hosts educational and cultural events. The site also contains an Association for the Maintenance of Local Farming (Association pour le Maintien d'une Agriculture Paysanne, AMAP) which is a local partnership between farmers and near-by consumers directly interacting with each other without intermediaries. This function of an AMAP makes Agrocité part of a short-circuit model underpinning its potential as "transitional urban resource."

Specifically, the area is divided into several smaller lots devoted to a gardening market area that is used for the AMAP, about sixty allotments for individual households, a common henhouse to shelter chicken, a greenhouse to grow plants that need more warmth, and a composting area where organic waste is aggregated. The composting plant area processes dead leaves and wood from

municipal parks or other entities of the neighborhood. This composting site has contributed around seventy-five tons of biomass every year for a generator that produces heating for the buildings. The area containing allotment plots makes up a space of about 400 square meters. Each allotment plot measures 1 x 2.5 m which family households can use as a vegetable garden. Another 400 square meters are used for the collective gardening that takes place within the site.

The space allows its users to research and experiment with certain gardening techniques such as hydroponic horticulture or phytoremediation. The core activity is gardening and producing produce which neighborhood residents can then use for themselves or sell to the local market space within the site. The wooden structure is mostly built with recycled wood and occupies around 200 square meters of space. The building also boasts a green roof with plants on it to regulate interior temperatures and absorb the sun rays in a natural and sustainable manner. The building itself is surrounded by a plot of land with market gardening plots, educational plots and plots dedicated to aromatic plants, compost bins, a dry toilet, rainwater collectors and a phyto-purification system. Beehives can be set up there, with the support of a local beekeeper. The structure contains various rainwater and wastewater recovery systems which help increase the building's self-sufficiency. For energy, the structure uses solar panels and a compost heating system that allows its heating to be self-isolated. The building contains a kitchen and an activity room which serves as a space for assembling meetings or gathering for community-led activities.

The site is seen by its surrounding inhabitants as a meeting place where locals can exchange knowledge and information about seeds, use of tools, technical know-how, and programs involving agricultural actions in the urban environment. The plots are maintained according to the principles of permaculture, which are thoroughly explained by the technique's co-originator David Holmgren (2003). Activities around permaculture are programmed through organizing workshops, training programs, and educational sessions or conferences on themes such as organic market gardening, ecology, and urban nature.

One of the fundamental approaches of Agrocité is to reduce and reuse household organic waste through a network of partners who specialize in local composting and aim to develop awareness actions. Agrocité also involves itself with the community of Gennevilliers by reserving plots of

land for children's' actors such as schools, leisure centers, and scouts. The aim of such an endeavor is to include the children of the neighborhood in a learning process on how to be ecologically responsible, particularly in an urban setting, while raising awareness of sustainable development issues. It also hosts several activities that are openly accessible to the local residents. Such activities include buffets through their associative canteen and an AMAP using the produce produced within the site. The use of an AMAP on site shows Agrocité's commitment to distributing its products in an equitable manner. The structure serves as an ideal spot for residents to meet on a daily basis and discuss local or community-related issues.

4.2.1.5 Ecosystem Services

Several ecosystem services can be identified when a commons appears in the form of an urban resiliency farm in a dense urban area. As mentioned previously (in section 2.5.2), ecosystem services can be categorized as either provisioning services, regulating services, or cultural services that stem from activities within urban agricultural commons. According to Raf Aerts, Valerie Dewaelheyns and Wouter Achten (2016), the provisioning of food from urban agricultural practices allows commoners to use old or non-commercial varieties of crops which are beneficial to human health and environmental health. Because the food is locally produced and distributed on-site without the need of mass-scale harvesting by agro-business or shipment of products often requiring heavy use of fossil fuels and other pollutants, such local provisioning also reduces the ecological footprint of farming. It is also beneficial to local residents, many of whom would otherwise be subject to food scarcity and/or live in marginalized urban areas known as "food deserts." Instead the urban farms provide these vulnerable city dwellers with a measure of food self-sufficiency.

Urban farms also provide regulating services that increase air quality, local climate mitigation, and water quality. As mentioned by Raf Aerts et al. (2016), air quality regulation depends on the ability of plants in urban spaces to attract and absorb particles and pollutants. The more plants you have in a given area, the more pollution is absorbed and taken out of the area's atmosphere. This notion gets strengthened through the increased presence of urban farms. Plant formation also help improve soil quality and reduce health risks associated with atmospheric disposition of heavy

metals and toxic compounds. In once heavily industrialized areas like Gennevilliers, such contribution of ecosystem services proves to be essential for the quality of life of residents. Compared to strictly built-up zones, areas with a lot of urban agriculture benefit from positive effects on water and energy flows that stem from urban gardens. This also contributes to providing regulating services for the global climate.

The more cities adapt to climate change through the implementation of urban farms, the easier it is for those cities to achieve an ecological transition and strengthen their carbon mitigation potential. Growing food locally also allows areas to decrease their greenhouse gas emissions by using non-intensive methods of farming. Aerts et al. (2016) confirm that small-scale production of alimentary goods helps render the local climate, soils, and seasons more sustainable while also reducing the household carbon footprint of residents who consume these locally produced goods. In addition, organic waste flows are recycled and therefore reduce indirect emissions that may come from fertilizer and pesticide manufacture. In addition, as mentioned by Erik Verbruggen et al. (2012), the use of compost and green manure, and the application of mulch and cover crops, are principles adopted from conservation agriculture to maintain soil structure, fertility and biotic activity. This contributes to the ecosystem services that urban farms provide in local areas.

In addition, there are several socio-economic ecosystem services that urban farms provide to nearby residents and cities. By growing and exchanging alimentary goods locally through short-circuit economies, residents can save a lot of money when acquiring these goods directly on-site. They can save some money by avoiding market prices for fresh foods. In addition, urban farms can provide people social interactions by working and maintaining the farm together. These social interactions can create bonds that make the community stronger and more democratic, especially when all social groups in one area contribute to the maintenance of that urban farm. As James Kirwan et al. (2013) have argued, bonding activities in urban farms enhance community cohesion and education, both of paramount importance in local food production systems that aim to render communities more sustainable. By eating food locally, people have healthier diets, which provide important health benefits. Different farming techniques can also be shared and learned among various residents, improving general knowledge in the population and its transmission between generations. In addition, urban farming can be perceived as a cultural activity, where people learn

more about the origins of their neighborhood through story-telling. All of these ecosystem services help make neighborhoods more resilient and self-sufficient, while contributing immensely to the ecological transition that so many cities aim for.

4.2.2. The Community and its Partners

Agrocité is a case study *par excellence* of a transitional urban resource in the form of an urban resilience farm providing its users with the tools of communal self-sufficiency in local food production while also generating crucial eco-services, decentralized energy production, and public education. But Agrocité is also part of a bigger SSE project, known as R-Urban, and in that sense an even more relevant illustration of how urban commons can be transitional. This positioning within a broader institutional context makes Agrocité's community and choice of partners most interesting to discuss.

4.2.2.1 Composition of AAA and the R-Urban Community

The concept of Agrocité originated with a collective called Atelier d'Architecture Autogérée (AAA), literally "Studio for Self-Managed Architecture," in conjunction with local residents and activists. AAA is a self-managed architectural workshop aimed at promoting collective uses and activities of spatial re-appropriation by communities and offering access to the direct-relation network of the local economy ("économie de proximité"). Towards that objective AAA has launched a bottom-up strategy of local activism, a network of resident-run facilities, to enhance urban resilience known as R-Urban (www.r-urban.net). Agrocité is part of that R-Urban project.

The R-Urban project is the brainchild of two radical thinkers of architecture and urbanism, Constantin Petcou and Doina Petrescu, who are also the key force behind the AAA collective. Petcou and Petrescu, both internationally renowned for their innovative conception of a democratically-run urban space supporting a superstructure of social-, solidarity-, and circular-economy actors woven together in networks, mapped out this vision a dozen years ago (see C. Petcou and D. Petrescu 2014; atelier d'architecture autogérée 2014; D. Petrescu, C. Petcou, and C. Baibara 2016). They managed to get early funding support from the EU as well as from local authorities in the north-western suburbs of Paris for their unique urban-development project called

R-Urban, which aims to put this vision into practice. R-Urban is a large-scale initiative that creates eco-neighborhoods from neglected urban spaces or brownfield sites. Following a bottom-up participatory approach, these eco-spaces are self-managed by the community to increase sustainability and provide ecological benefits in densely populated, under-served areas.

4.2.2.2. Cooperatives as Partners of Agrocité

Several partners have joined the R-Urban initiative either as key actors in decision making processes or as facilitators of the initiative. As mentioned before, Agrocité is part of a short-circuit network constructed by R-Urban and as such communicates constantly with the other hubs. One notable partner in that R-Urban network is called RecycLab, a recycling cooperative located on Boulevard d'Achères in close proximity to Agrocité's site. As a cooperative, it follows a model of gaining common capital from its operations that is then used for the cooperative and the rest of the R-Urban network. Since RecycLab functions for the betterment of the community it serves, its main objective is based on reuse and recycling of local resources to put them back into circulation for the neighborhood. It transforms material and organic waste into products that are reusable. In addition, organic waste by Agrocité and other food-related businesses in the area becomes composting material that could be used to fertilize gardens back in Agrocité, creating a feedback loop of recycled and reusable organic material. There is a clear environmental focus that tries to provide residents with alternative options rather than cumulative capitalistic consumption that is so present today.

Agrocité's structure itself is a site made out of reused wood. The equipment used to construct the building is an insider example of the unit's operations, as it comes from materials used for eco-construction from the recycling of urban waste in the neighborhood. The unit focuses on reinventing new uses for old obsolete materials, especially raw materials used for building projects, and on improving ecologically sound practices in the field of construction and repair of goods, while also offering educational activities and workshops. Agrocité's involvement in construction could have been even more extensive. It was supposed to establish also a partnership with EcoHab (http://r-urban.net/en/projects/ecoophab/), an eco-housing cooperative project comprising seven

partially self-built housing units that would be collectively managed by its own residents. But the municipality was unwilling to provide a third location in its territory, so the plan failed in the end.

RecycLab and Agrocité remain essential partners in reducing waste and producing compost material for the neighborhood. Composting is actually a key ecosystem service activity of Agrocité which can take a variety of forms. For instance, Agrocité's canteen provides cooking services resulting in a lot of organic waste much of which gets distributed to nearby markets and local shops, such as the Biocoop Les Bruyères shop and a local brewery called Astrolab. Examples of these valuable composting materials include peelings and beer malt that come from the canteen. Agrocité also collects organic domestic waste from residents of the neighborhood and nearby local businesses to turn it into compost that can be used for the garden and its fertilization. Such composting is also used for heating, or for developing seedlings in collaboration with the municipal environmental department, helping to cement a key partnership in ensuring the resilience of the commons. There is a solid recycling system between RecycLab and Agrocité. Both operate through the collection of recyclable materials such as wood and metal textiles, which come directly from the neighborhood through demolition by the joinery, scrap from carpenter's workshops and wood packaging stores.

The R-Urban initiative of AAA, through both its Agrocité and RecycLab units, has over the years managed to develop relationships with local partners aimed at launching several local circular-economy experiments. Actions of commoning in that endeavor range from co-production of economically transferrable resources to engaging in dialogue with prospective partners which have been central to make these economic relationships possible. One strong economic bond is between R-Urban and a local sport retail chain recycling old bicycles. Those are provided to RecycLab to transform them into functioning cargo bikes which are self-built by the users in Agrocité themselves. Another is between R-Urban and a local high school called Lycée Valmy in Colombes. RecycLab acquires textile waste from the school which is then refabricated or restored by textile designers at RecycLab. The textile is then used by its users or donated elsewhere for re-use. In addition, RecycLab also hosts a furniture recovery program with a group of local manufacturers. Their operations take place in a co-working space at RecycLab for a nominal fee. These kinds of relationships provide employment opportunities for local partners and access to certain reusable

resources by its users. That kind of economic development provides new cycles of reusing materials, which is obviously an important aspect of the ecological transition we are all aiming to advance. Local users do not need to buy new products, since they get these goods more ecologically through the recycling channels which Agrocité and RecycLab have created with those local partners. It is also worth noting that the products and services provided by the partnerships Agrocité and RecycLab have engaged in with other local suppliers also promote short circuits connecting locally grounded production and consumption activities in environmentally sounder ways.

In the interest of promoting short circuits Agrocité has established partnerships with nearby local businesses aiming to expand what they produce on site. Those partners include Biocoop, CLER, Greenpeace, and La Nef. Partners exchange produced goods within Agrocité as well as recyclable goods such as composting material. Fostering economic relationships through ecological initiatives is a very important goal for Agrocité, and it implements this objective in every action of commoning it takes. Agrocité fosters inclusion of other organizations and local institutions into its daily operations. Partnerships with organizations and local institutions include Regie du Quartier, Cultural and Social Center of Gosses-Jean, Social Center Europe, Lycée Valmy, BioCoop Les Bruyères, and Aurore Organization, all serving specific roles of co-production and neighborhood care. These partnerships are secured by social trust and pro-active civic dynamics that all get emphasized during conversations between Agrocité and interested partners. Those discussions continue to be an ongoing process, especially as Agrocité considers social trust through relationship building to be one of its key commoning objectives.

But representing the fullest possible "transitional" urban resource, Agrocité pushes its cooperation outreach even beyond its dual role as vector in the circular economy and propellant of short circuits as it seeks to be a key player in a more ambitious SSE network project built around the AAA collective's R-Urban design. Take, for example, Agrocité's partnership with Enercoop (www.enercoop.fr), an energy cooperative in France devoted to the development and distribution of sustainable renewable energy through collectively decided fair rates and shared ownership between members. They supply electricity to coop members, and Agrocité is one of them. Both partners have the same objective, which is to render poorer neighborhoods more sustainable and

resilient. Enercoop supplies the solar panels of Agrocité through community aggregation in partnership with the municipality. This allowed Agrocité to get those solar panels and use them to provide electricity to the natural grid, which gave them a certain level of negotiation power with the municipality itself. The rates charged are collectively determined using a "fair price" formula, reflecting Enercoop's main non-profit interest to supply renewable energy affordably by aggregating interested partners, such as citizen associations, local authorities, and key players in the Social and Solidarity Economy. These include many of Agrocité's local business partners in the Gennevilliers area whose access to affordable renewable energy adds supplies to the regional electricity grid and strengthens thereby their standing with the municipality.

Enercoop tends to work exclusively through private agreements with small French renewable energy producers. This approach makes for a broader network of actors committed to the green and socially responsible energy transition. The partnership between Agrocité and Enercoop resembles a strong Cooperative-Commons alliance of the kind I have discussed elsewhere (Guttmann 2019; Guttmann 2021), because you have both actors working together and complementing each other to achieve a common initiative. Here the cooperative supports the commons by providing financially viable supplies of green energy. Agrocité in turn provides the cooperative with support for increasing its goal of sustainability. This relationship also gets support from the municipality which benefits from the extra energy being fed into the grid. This example of a commons-cooperative alliance shows how potentially fruitful it can be for the two domains to work together, thereby forging a stronger network of actors committed to the green and socially responsible energy transition in the Parisian region. Enercoop has shown commitment in working with Agrocité on future projects, indication of a durable alliance helping neighborhoods to become more resilient over the long haul.

No commons can be considered resilient anywhere without this very important factor of partnerships and a deep reservoir of social trust supporting those. This is the guiding principle of AAA's R-Urban project of which Agrocité is just one aspect, as is RecycLab. The plan for R-Urban now is to develop a wider Development Trust Fund on a local and regional level that would eventually fund the creation of SCIC cooperatives through a network of partners like AgroParisTech, CHP, Habitat Solidaire, La NEF, Le Labo ESS, L'Atelier ESS and Terre de Liens.

This would allow R-Urban to expand its "social and solidarity economy" model further while continuing to protect and provide financial resources for its commons. R-Urban's development strategy is thus based on network creation which builds on the commons-cooperative alliance model that would harness the commons movement even further.

4.2.2.3 Local Institutions as Partners of Agrocité

AAA's R-Urban project also seeks to engage in dialogue with government authorities to develop relationships of legal support where the commons have jurisdiction to exist and proceed with their objectives. In 2009 AAA engaged in negotiation with the representatives of the Colombes Municipal Council precisely to commence building such a source of legal support. This contact also included engaging with the mayor, specifically to apply and obtain funding for the implementation of R-Urban. An agreement was concluded, assembling a coordination team comprising AAA members leading the research of R-Urban, municipal departments, and council representatives. The idea behind this cooperation effort was to get all stakeholders working together to launch the R-Urban project, with an EU-funded program implicating other possible stakeholders in the co-production process of this project which included formal assessment sessions by municipality representatives and urban planning experts to provide feedback for the project's implementation.

The coordination team and the co-production process both made it possible to jumpstart the project in the field by 2011 through the construction of three hubs linked to each other. Those three hubs, Agrocité, RecycLab, and EcoHab, were the foundations of the R-Urban project, and a civic network was created. The next step of gathering stakeholders was to recruit residents interested in the project and have them voice their opinion on how workshops could be implemented within the three hubs. Eventually, those workshops became the hallmark of the three hubs' co-production process whereby residents involved gained an important leadership role. That mobilization effort functioned so well that the workshops continued under the leadership of these engaged residents, even after political changes occurring in the municipal government subsequently forced R-Urban to relocate its operations such as Agrocité.

This example demonstrates how resilience can be built when governments facilitate partnerships and provide the grounds for civilians to take leadership in implementing such projects. The relationship is based on the co-production process that was developed by participatory action research between all of these actors. In this case, the co-production process was forged through conception building, by defining collective governance schemes through debates, discussions, and negotiations, and with the help of creating networks among all stakeholders. Since this relationship between actors of AAA, residents, and representatives of the town of Colombes created the R-Urban project, Agrocité and the three hubs were fully invested in creating more local partnerships with institutions existing in the area. Today, this process is ongoing.

Relationships with local institutions continue to be a priority for Agrocité, especially as it tries to reinvent systems of collecting, using, and recycling grey water (i.e. wastewater from households and office buildings, except from toilets) without having to depend solely on the municipality. In order to become self-sufficient, Agrocité and its network had to have the support of local municipality as a facilitator of the commons. In order to do that, the commoning tactic of engaging in dialogue with institutions for support and contract negotiations was paramount in getting that support from the government. Agrocité ended up planning to install a self-sufficient plant filtering system using grey water which would be fed by the dry toilets as an off-grid sewage system, thereby bypassing the city's waste or sewage facilities.

Unfortunately, without a proper permit and environmental assessment, such a system is not legal, even if it helped Agrocité become self-sufficient in its operations. Agrocité decided to pursue a deal with the municipality where they would not have to pay for municipally-managed grey water treatment, especially since the public system does not connect to Agrocité's. Negotiations took place during which Agrocité showed the municipality that its system would not necessitate the involvement of the city's services in treating grey water, and a deal was struck where Agrocité ended up not having to pay for the town's greywater treatment services. The deal hinged on Agrocité using solar panels provided by Enercoop to sell a surplus of the energy produced on site back to the national grid at a reasonable price.

Agrocité also gained a small surplus from the price-fixing negotiated by the government, which helped cover its maintenance costs. In other words, the government and Agrocité sought a win-win relationship in negotiating the separate off-grid grey-water system with extra energy provided to the national grid by Agrocité's solar panels. This sort of circular production of systems and resources also contributes to the notion of a short-circuit economy, with a local government institution able to provide Agrocité legal grounds for its operation. In this case, Agrocité has the municipality as the state facilitator of the commons as well as a solid economic partner. All of this was made possible through the actions of commoning by users to co-produce resources for the government and enter into ongoing dialogue that led to negotiations and ended in contractual agreement.

These relationships have also helped Agrocité develop workshops devoted to knitting, crocheting, cooking, and aromatherapy. These workshops act as social services for the unemployed women living in the social housing around the site. Agrocité also managed to hire a farmer from the area as an initiative instigated by Community Supported Agriculture (CSA). Such mechanisms within Agrocité are recognized by farmers' groups, a mechanism that helps Agrocité gain further support from actors in the community. The School of Composting also provides an employment opportunity to composters, who then get employed by the municipality to run and teach in the school.

4.2.3 Commoning as a Driver of Collective Governance

My thesis has put a lot of emphasis on acts of commoning, an especially important dimension of commons research when it comes to urban commons created from scratch as transitional urban resources. In this regard Agrocité is an outstanding example. It has gained a strong presence within its locality, engaged in a large variety of production and co-production activities, built up many constructive partnerships, developed good relations with the municipality, and benefited from being part of a broader SSE project run by a very entrepreneurial collective of radical urbanists. These are all conditions making it easier for commoning activities to be successful.

4.2.3.1 Tactics for Community Involvement

The notion of commoning is key to Agrocité's success and resilience. Even during times of conflict, commoning was used to find solutions and seek resilience in a progressive way. When the temporary deal in Colombes fell through, being in contact with nearby municipalities helped AAA's commoners find new spaces for Agrocité and other pillars of the R-Urban project in Gennevilliers nearby. Through collective contributions made by members, Agrocité has managed to produce a whole host of alimentary goods which circulate locally and feed many of the most marginalized people in the neighborhood. Agrocité also established itself in the neighborhood by hosting events that were open access. Such events required the collective organization of its members. When key decisions had to be made, Agrocité's commitment to democratic principles had its members find ways of encouraging collective decision-making through voting and soliciting input.

Several tactics for community involvement have already been mentioned with the mapping processes, the co-production of physical assets produced within the commons, dialogues forged between various actors, including those with the local authorities facilitating the partnership with the commons, and the establishment of local circuits representing the economic relationships various actors have developed within the neighborhood. There are other tactics getting the community engaged in the commons which are imperative in the commoning process. These include hosting assembly meetings and gatherings where more residents get involved and are made to feel comfortable with the presence of a commons in their midst.

One of the ways the AAA collective involved communities was during the preliminary phases of R-Urban's strategies. Citizens were invited to share their knowledge of the neighborhood through interactive mapping processes. Afterwards, the residents' participation was key in getting the site constructed for Agrocité. Their participation was further marked by the construction of the wooden structure and the grey-water system, along with setting up the gardening areas and allotment plots together. The biggest example of involving residents in the functioning of Agrocité was in the activities undertaken right there on-site. Residents were collectively in charge of organizing their own activities in the hubs, such as recycling, gardening, and upkeep of the spaces. The activities

are split into categories based on the spaces that are used. Some activities are in the wooden house, while others take place in the garden or the composting sites. Finally, some residents possessing technical know-how about grey water systems are in charge of maintaining the self-sufficient system.

It is evident that the involvement of the community is determined by the sharing of roles and responsibilities that are decided democratically amongst them. These decisions are made by concentric actor networks. Residents form different working groups and initiatives to manage various ecological systems within the site. Those different systems are categorized in terms of the market garden, which takes place in the form of an AMAP, the henhouse where residents are in charge of taking care of the chicken, the beehives, the composting sites, the flea markets, the soup events, the canteen, and events devoted to social services and help for the community.

The building itself houses all activities that deal with assembly meetings, kitchen tasks, and technical chores such as the maintenance of the heating system and the solar panels. Such examples of social organization are displayed by roles of responsibilities and participation of the residents selling food in a solidarity market or conducting other activities related to the Social and Solidarity Economy. The physical division of labor involving the shared gardens are also somewhat similar to those taking place in the building itself. Townhall meetings are used to discuss issues affecting Agrocité so that residents can voice their opinions on various concerns. Those get-togethers reaffirm the connection with the municipality facilitating this project, as well as the AMAPs, while also reinforcing the support and collaboration with other important actors in the neighborhood. Community involvement is what makes this space a common urban space and provides a running score of the current projects taking place in the area.

In the garden, there are examples of the uses of ecosystem services such as, for example, the symbiotic roles insects play in the fertilization and production of produce. Food based on animal products, much of which is produced on site for the hens, permaculture practices, food crops (e.g. mint, parsley), seasonally specified plantations, winter counter practices, composting, or partnerships with local composters are all present as activities in Agrocité. All these tasks are organized by active volunteers. Another example of ecological commoning tactics is how the

gardeners use beer-malt to prevent the spread of invasive insects and protect the beehives which are used in apiculture. Another important task concerns the barriers residents have installed to protect the garden. This is an important issue, not least because it displays the tactical tasks of commoning to preserve this space. Installing barriers collectively is important in determining the physical boundaries and access points of the space. These examples serve as a summary of how Agrocité is really an urban commons, both in terms of its presence (especially when it comes to how it is used for the inhabitants of Gennevilliers) and also through its functioning of collective and self-managed activities.

As is typically the case with almost all of the urban commons, there are some important requirements for a commoner to become a member entitled to contribute to the collective decision making of the space. These requirements were monetary to establish proof of interest and commitment to the space. To become a member, a nearby resident would have to contribute ten euros a year for simple contribution and participation of the general shared parts of the space. To obtain a single allotment, that contribution would rise to twenty euros a year. These membership fee requirements can be seen as an act of commoning to ensure solid participation and avoid free-riding, which makes the functioning of the commons more equitable and secure. It is important to have avenues of entry that are feasible for everyone, but the interested members must give back to the community. This is key in making the commons a sustainable space in the neighborhood and avoid the 'tragedy of the commons'. It is possible to contact Agrocité members for more information or for confirming a participation through listed email addresses and social networking sites.

Agrocité aims to play an important role for the community while getting more members involved in its operations. For that purpose, it hosts a series of social events to mobilize the residents so that they may discover the space and eventually become members. For example, Agrocité hosts a common buffet every Friday that is open access to everyone. During these barbecues debates are conducted on how best to get more residents involved in Agrocité's initiative.

The local market in Agrocité has hosted frequent events of purchasing goods developed within the commons as part of a non-consumerist movement to move towards circular and more sustainable

economies. These reflect Agrocité's attempt to boost the local economy through relations of exchange, barter, aid, and mutualized purchasing. Such goods included organic herbal teas produced from the Garden of the Centaurs, located in Agrocité, honey produced by the hives of the main beekeeper of Agrocité, jams and preserves that are cooked at Agrocité by the inhabitants (through products that are grown on the spot or recovered at the end of a usage process), feral trade coffee which originated from fair-trade partners in Mexico and travelled through the social networks to Agrocité, and origami that originated from nearby residents through specific artistic programs taking place in Agrocité.

Several reunions also take place on Thursday nights among residents and members of Agrocité. These get-togethers consist of lunch association meals from dishes prepared with foods coming from the garden production. The average price is a reasonable five euros. Several workshops have taught residents how to prepare jams and preserves. The green tomatoes used for these workshops are harvested from the garden. Through the plant production at Agrocité, members offer sales of seasonal vegetables grown in the garden without the use of chemicals but instead with the use of seeds of local varieties. Interested residents can hand-select which vegetables they want to buy at a price listed at the entrance of Agrocité. This provides an opportunity for inhabitants to eat locally produced fresh produce while gaining more understanding of the production and harvesting processes of these vegetables. The plant production in Agrocité also includes production of grains from different seed specimens that are produced on site. Agrocité has managed to harvest large quantities of Moroccan lettuce, chard, and beet. Other products include zucchini, different varieties of tomatoes, red cabbage, different varieties of potatoes, dwarf beans, onions, lettuce, Moroccan salad, radishes and chard. All of these are sold at just fair prices or exchanged within the local economy to nearby residents, strengthening the short circuit of the neighborhood.

4.2.3.2 Collective Physical Assets

One of the main actions of commoning found in Agrocité is the capacity for its members to organize the production of specific internal resources collectively. R-Urban describes it as the organization of 'collective physical assets,' a concept implying resources being co-produced and collectively managed by the commoners, with the ability to make these resources locally

distributed and reusable for other ecological purposes. Such physical assets can be composting material, specific locally grown products, and materials that make the space sustainable and self-sufficient (such as solar panels, partly recycled wood for construction, and a 'dry toilet'). Such physical assets contribute to the self-sufficiency of Agrocité. As R-Urban states, the hubs linked to Agrocité become nodes of an ecological metabolic system. Such a system is only made possible in a neighborhood like Gennevilliers through co-production that takes place in the commons. Within the hubs, especially RecycLab, the metabolic system is measured by how much organic waste is collected from the neighborhood for composting that then feeds the urban agricultural system of Agrocité. The feedback loop thus created nurtures a short-circuit economy that is autonomous and outside of any public or private intervention. Such a set-up makes the urban commons more resilient. The actions taken by commoners to manage the composting material and provided to RecycLab is considered an action of commoning. RecycLab then refines the material to make it usable for Agrocité's urban farming. Such a partnership of production and reuse of material is an action defined as co-production.

These collective physical assets all contribute to the added value produced within Agrocité that then gets distributed to the community through its participating members. Such dynamics also provide visibility to the feedback loops of the territory, which in turn feeds the short circuit and make the commons and its various partners more functional and robust for the neighborhood. The resources co-produced in Agrocité are locally produced vegetables and animal products, such as eggs, honey, and worm compost. These resources then get distributed locally through the mini-market known as an AMAP, where these products are sold at a just fair price, at the shop, or at the canteen, where those products are used for cooking meals for the community. By receiving these products directly in the same location, Agrocité has managed to make a hybrid economic model out of the canteen. Twenty percent of the profit made at the canteen gets deposited back to Agrocité's operations to cover some of the expenses. Agrocité also provides some of its available space to the "School of Compost", which is an external training program teaching people how to compost. It is run at Agrocité periodically, allowing it to recuperate a small rent to pay partially for the maintenance of the space. The co-production of these physical assets also allows Agrocité to generate a whole host of ecosystem services for the neighborhood. This form of co-production also protects the commons itself and makes it more resilient in the local surroundings it is situated

in. In addition, co-production encourages people to use the commons for resources they would otherwise have a difficult time obtaining. They thus buy local products that they created, allowing them to consume where they produce. This takes the commoners away from a market-based system and strengthens the resilience which the community needs if it wants to help especially the most marginalized people of the community.

4.2.3.3 Conceptual and Physical Mapping Techniques

In order to make the R-Urban project possible, it was necessary for the various actors involved to locate possible spaces where the three hubs could be installed. Mapping tactics with citizens were undertaken to find these possible locations. Such tactics were instigated through spatial design processes involving citizens working together and finding these locations. Because residents have a generally solid and intimate knowledge of their neighborhood, their input was essential in the R-Urban spatial design processes. This collaboration was also an indicator of a shared commitment to pursue a democratic governance scheme for the commons, starting with hands-on mapping techniques.

Citizens determined which plots in Colombes were available and unused by the municipal authority. The participative mapping process included residents who collectively determined locations for the first three hubs (Agrocité, RecycLab, and EcoHab). In 2009, an informational meeting was set out at the townhall where AAA researchers, associations, citizens, and representatives were brought together for ongoing discussions. The objective of the meeting was to look for available land. Residents provided input based on their local knowledge of the area, and they determined and physically mapped out twenty available sites. Based on a variety of factors, such as proximity between the sites, current use, land ownership by governments, and overall land value, three sites were chosen. Those sites were in close proximity to each other to facilitate the networking and short-circuit activities of the R-Urban project. Such a process is a commoning tactic that takes place before the implementation of a commons in a specific area.

The collective discussions and pinpointing of locations were based on land availability and accessibility to which the residents contributed with their local knowledge of the environment. The

municipality of Colombes responded by identifying the three sites proposed as being indeed owned by the city and thus available for installing the three hubs. After a long set of negotiations between the residents and the municipality, two spaces were approved for Agrocité and RecycLab. In 2014 a third spot was reserved for EcoHab. But that was cancelled due to electoral shifts occurring that year, changing the municipal leadership of Colombes. The new governing bodies of the local authority withdrew their support for a third site.

This mapping process involved acquiring the local knowledge of residents who were immediately interested in having these projects implemented in their neighborhood. R-Urban provided the tools and the space of negotiation through their initial dialogue with the municipality. The local knowledge of residents allowed R-Urban to map out these sites physically and digitally. AAA uses OpenStreetMap, an open source mapping software, where these sites were accurately located and displayed to the municipality. AAA has a history of using OpenStreetMap as a commoning tactic in other projects around Paris.

When AAA developed ECObox (http://www.urbantactics.org/projects/ecobox/ecobox.html) with residents of the 18th district of Paris, they also used OpenStreetMap to find wastelands in the district for ECObox's installation. Mapping techniques helped determine what wasteland has remained fallow in Parisian neighborhoods for over ten years. While ten years may not be permanent, it is enough time to test commons, use them as a means to increase resiliency, and change the political debate on what the neighborhood needs so that the spread of commons can continue in other areas. The mapping exercise also concluded that unused wasteland has less land value than other vacant lands, making it easy to acquire for the commons. OpenStreetMap was the software that helped all the stakeholders develop these important conclusions, proof that AAA's mapping has worked before and should be used elsewhere.

In other words, this tested tactic was developed to be reused for other projects, such as R-Urban. The use of such a tool in collaboration with all actors was a tactic of commoning that made the implementation of Agrocité possible. Such a process has proven to be a crucial commoning tactic not only for the commons itself, but also the residents of the neighborhood whose input only strengthens the commoning process. As elaborated in the book on mapping cities edited by Nishat

Awan (2017), especially the article by the AAA's Doina Petrescu, their input allows everyone to be engaged in important questions about the politics of representation. In addition, these mapping exercises take into account all aspects of a resident's relationship with the neighborhood, which is important for all local actors to understand if they are to live and co-produce together. This also helps the neighborhood get developed according to the residents' needs and eliminates spaces where the prevalence of crime harms the neighborhood.

Through these mapping processes, local dialogue is established and a quest for resilience by the neighborhood residents becomes achievable. The mapping process is an example of participatory action research that is needed for commoning. As mentioned by Basant Maheshwari, Vijay P. Singh and Bhadranie Thoradeniya (2016), the mapping process undertaken by R-Urban and the residents is a solid example of knowledge exchange, experimentation, and social learning that solidifies the notion of commoning. These processes generate collective future visions about a neighborhood and promote ongoing community involvement, thereby allowing the commons to achieve their goals.

4.2.3.4 Conflict Resolutions

Agrocité has been a case study of gathering actors from different backgrounds together for a collective interest of increasing resiliency in the neighborhood. Such a process inevitably comes with internal conflicts, especially since there is a multitude of users who have different visions about the collective management of such a project. Conflict may also arise from certain users using this collective management as an opportunity to appropriate tools for their own gain and negotiate agreements in pursuit of their own personal self-interest. Agrocité has developed certain mechanisms to deal with these conflicts internally.

One of the major mechanisms for conflict resolution was to elect a group of users who were skilled in conflict management and were in constant dialogue with the protagonists of the conflict. The decision to elect the leaders of this group was based solely on conflict resolution skills. Those leaders were democratically confirmed by the users of Agrocité and RecycLab. The AAA's Doina Petrescu has claimed that these conflicts and the methods of resolving them were a part of the

commoning process. A project with no predetermined agenda, such as R-Urban, will always have conflicts because of its variety of shared interests which may diverge at times. He describes Agrocité as an 'antagonistic space', so conflict is inevitable. But these conflicts help the entire user base to present their divergent interests and values, which may express demands for different alternatives. If managed well, such expression of divergences can be considered to be a 'prerequisite for truly collaborative resilience.'

When the first site of Agrocité was torn down in Colombes after the municipality fell under Gaullist control, there was citizen mobilization to protest against this action. Such protests took the form of peaceful demonstrations and petition signing to reflect widespread local support for Agrocité as manifestation of urban resilience. While this mobilization did not work in the end, it helped foster the resurrection of Agrocité at Gennevilliers. That municipality listened to the voices of protest and responded by welcoming them into their commune. This is an example of the R-Urban initiative giving a political voice to its community and providing it with an adequate outlet to which its concerns could be responded to. That in itself is a form of resolving the overall conflict between residents and their governing bodies as a form of commoning.

The fact that Agrocité has developed the tools of expressing divergent interests as well as the social devices for conflict mitigation shows the importance of undergoing a process of commoning to identify conflicting matters and deal with them in a democratic matter. That is exactly what Agrocité has done by collectively deciding who can be leaders during periods of conflict. That has helped Agrocité address these conflicts in a non-disruptive manner. Conflict resolution is a principle presented in Ostrom's work on the commons, and it is an essential part of the commoning process.

4.2.4 The R-Urban Charter

A charter for Agrocité had been written and widely distributed even before its implementation, namely AAA's R-Urban Charter ([http://r-urban.net/wp-content/uploads/2012/01/7.2.9.2- CharteRurban-Fr.pdf](http://r-urban.net/wp-content/uploads/2012/01/7.2.9.2-CharteRurban-Fr.pdf)). While there is no specific charter dedicated solely to Agrocité itself, the R-Urban Charter represents Agrocité as being part of a whole network dedicated to a "collective

ecological transition" that is based on a circular economy. The R-Urban Charter includes several nodes, including associations like AAA, cooperatives like Recyclab, and commons like Agrocité, all working together to build a circular economy. It is with this charter that we can identify key tactics used to build Agrocité along with its proximity network to encourage citizens to participate in the ecological transition.

Written in the run-up to the Paris Climate Convention of 2015 and making its connection to the Paris' COP 21 meeting quite explicit, the four-page R-Urban Charter highlights the importance of activities that pertain to carbon dioxide reduction, ecological footprint reduction, and waste management. All these are objectives to build upon the ecological transition. The charter claims that such activities are achievable by setting up a network connecting commons, cooperatives, and other SSE actors, including as many local residents turned into activists as possible, an institutional pillar on which to build a circular economy. The charter's support for local, solidarity-, and circular-economy activities can be a crucial institutional framework within which to place also urban commons like Agrocité. They would then have the chance to co-produce a broadly based and widely supported set of transitional urban resources promoting urban resilience and communal governance. Activities involving these various network partners in the circular economy are participative financing, finding members of land cooperatives, promoting the sharing of spaces, resources, and equipment, and reduction of energy, water, and transportation. The charter promotes collective participation in any of these spaces to reach those mentioned objectives.

The R-Urban Charter also puts a great deal of emphasis on the "build local, act global" notion, where local activities are done on a small scale while contributing to the dissemination and development of networks at the larger scale of region, country, world. The AAA members and all the local activists belonging to the R-Urban network project strongly believe that democratic management and decision making should follow the principle of one person, one vote, a concept found in the ICA principles for cooperatives. The charter highlights the precise steps allowing such democratic participation to thrive, including rotation of mission, encouraging cooperative models, and building upon projects that are not necessarily profitable, but that contribute to the general interest of achieving an ecological transition where waste and carbon are vastly reduced, and awareness is raised.

The charter also encourages commoners to challenge public authorities on the urgency of the ecological crisis we face today, precisely because these authorities, under the capitalist structure of today's society, are not responsive to the crisis. Therefore, commoners following the R-Urban Charter and having built Agrocité have the responsibility to confront the lack of action from the state and the private sector with an alternative model of cooperative action. This network of commoners can promote the participation, evaluation, and transmission of knowledge that would allow an ecological transition to take place. The objective of R-Urban in general, and also specifically Agrocité, is to re-build urban ecosystems with more carbon sinks, use renewable energy sources directly on site, and build institutional infrastructures that regulate, analyze, and strategize the scaling-up capacity of commons within the R-Urban network.

The R-Urban Charter (https://wiki.remixthecommons.org/index.php/Charte_R%27urban) was organized in a rather democratic matter. Following a number of collective decisions, commoners drafted the proposals of rules and principles in a participatory manner, designed to guarantee a level of sustainability and resiliency. The rules were then approved by all interested participants and network members in a process of collecting signatures of support, with signatories confirming that these principles are applicable in practice. The charter's signature procedure also aims to widen membership by soliciting and securing in that fashion residents' and other actors' commitment to the charter's provisions by signing on in approval. Signatories then agree to share resources and infrastructure to build on a solid network. While this charter has no formal legal status, its accumulation of signatures demonstrates that its principles are followed internally as proof to the municipality that the commons is organized and actively improving the ecology of Gennevilliers with partners. This is indication of how advanced Agrocité's commoning strategies are and also confirms its capacity to test strategies. Both Agrocité's greater scope of participation and also its higher ambition for network expansion indicate that this urban commons has surpassed the founding stage of the Bassin Versant Solidaire de Forest and its "birth certificate." Such a comparison allows us to use their respective charters as indication where each commons stands in developing its commoning processes.

The charter also puts emphasis on the expansion of R-urban by inviting members of the network to develop new project initiatives. Membership is supposed to indicate a commitment to these activities through the development of daily practices, shared skills, and collectively pooled or created resources. New commoners are encouraged to participate actively in the operation of existing projects, network with project leaders and other stakeholders, and create new projects oriented around specific themes. These objectives are realized through recurrent meetings that take place in the commons spaces within the R-Urban network, including that of Agrocité. As a result, the R-Urban charter, good representation of how a commons charter looks like, has become a key tool in establishing the governance of Agrocité. It actively includes partners that are cooperatives, such as Recylab, to contribute to their objectives, principles, and activities so that a circular economy can be created as resources on the basis of what the charter promotes.

4.2.5 Agrocité's Reproduction Elsewhere (Bagneux, Montreuil)

The success of Agrocité at Gennevilliers has prompted other communes in the Parisian region to develop initiatives that allow the equivalents of Agrocité to flourish elsewhere. This is especially true, as Agrocité has become a hallmark of the ecological transition cities are pursuing. Residents benefit from the social mechanisms and tactics of commoning taking place within Agrocité's site with increased resilience. In 2019, the municipality of Bagneux reached an agreement with R-Urban partners to develop an Agrocité in Bagneux (specifically at rue de la Lisette), a suburban town eight kilometers from the city center and easily accessible by Paris's regional transport network. Like Gennevilliers, the Agrocité of Bagneux is also providing participative workshops to help Agrocité's construction while establishing relationship among residents in the area.

During 2019, with the help of about twenty participants, members of Agrocité managed to complete the gabion retaining wall and the staircase to access the technical pit of dry toilets and rainwater collection tanks. Then they collectively designed and built the PMR access ramp and the terrace staircase. Members also installed the mosaic on the kitchen floor, with the help of adherents to use reusable tiles. The kitchen was thus completed, and the artist Laure Thélier designed the pattern for the five square meters of space, giving an artistic touch to the common area. In subsequent participative workshops, residents have been working the mosaic kitchen floor while

taking care of the phyto-purification basins and the straw insulation. All of these activities were completely collaborative among residents, showing that the same tactics of commoning are being tried out successfully in Bagneux.

The entire structure of the building and the terrace have been built, the joinery has been laid, and the first furniture items have been installed. The embankment has been modelled, and the land took shape. On the garden side, the plantations have been developing at a rapid pace with dug-out mounds to be used eventually for the collective market gardening in permaculture. With a few members, Agrocité has also submitted a proposal for the city's participatory budgets to obtain further financial support from the municipality. As evidenced by the activities taking place in Bagneux, much of those tactics of commoning are being re-used, showing the capacity for residents to learn from tactics used in previous commoning experiments. The implementation of Agrocité at Bagneux is an example of how the commons movement is spreading to other pockets of the Parisian area, showing signs of increased resilience and a common understanding for the need to implement these kinds of commons-based development. That means that Agrocité as a concept has also reached an important level of success. Eventually, Agrocité is planning to implant itself in Montreuil as well, which is one of the closest suburbs to Paris. This case study highlights the success of commons through actions of commoning in one of the most privatized and densely populated urban areas of the world.

Section 4.3 Case Study #3: Murs à Pêches

This third section will present the last case study, called Murs à Pêches. We will go over all the details regarding this case study, including background information, the community, their governance structures, commoning tactics, and their charter, which covers all of this information. The charter is found in the REMIX the Commons platform.

4.3.1 The Nature of the Resource as a Commons

My third case study, the Murs à Pêches, deals with a legendary orchard dating back five centuries which contains peach trees growing against a wall. Its peaches, highly reputed for their taste and

quality, were once served at the royal courts of Europe. Industrialization and urbanization have squeezed the site to a fraction of its original size, and even that lot is threatened by private developers wanting to get their hands on this strategic location for commercial exploitation. Several neighborhood associations have grouped together in response to preserve the remnants of the original orchard, turning into an urban commons whose activities have made it a valuable resource for the neighborhood and even beyond.

4.3.1.1 The Heritage Site

The Murs à Pêches is originally a heritage site ("site patrimonial" in French) in the upper hills of Montreuil, a neighborhood located in one of the most densely populated areas of Paris' *banlieues*. The site, which contains a lot of archeological artifacts dating back to the 16th century, serves nowadays as a mesh between a historical and cultural site as well as a natural space. The heritage site takes currently the form of an orchard that reaches a size of 35 hectares or around 87 acres. The space consists of several micro gardens, natural spaces, neglected brownfield sites, and several concrete walls which mark this place as an artificially constructed historical site. While the site is mostly nature, it also contains art installations made by the residents themselves. These art spaces, which play a dominant role in the art production of the neighborhood, can be found in various parcels spread throughout the site. The mix of all these features makes the Murs à Pêches a difficult space to define. It is a hub that is based on meshes between natural spaces, spaces of horticulture and urban agriculture, a space containing a lot of history, and a cultural space of art and festivities.

A heritage site is another form of urban commons that may appear in cities. It has certain characteristics that are very similar to urban gardens. But instead of reinventing a neglected space, a heritage site is a space whose origins date back quite a while and which contains cultural heritage that qualified government bodies had previously decided to protect. Such a space, often constructed a long time ago, has typically evolved over several generations. Hence the main goal of rendering such a space a commons is aimed at protection and preservation while promoting open access and various uses by its nearby residents.

The definition of a heritage site is based on the notion of cultural heritage denoting tangible and intangible goods that have a certain historic or cultural importance and are usually protected,

preserved, or managed by some entity. That entity can either be a private organization or association, or it can be a public authority such as a municipality, region, or a country. These sites are often protected, because they are considered to be special and unique properties containing cultural capital for people to benefit from. The cultural property can then get preserved and/or restored to be shown to the public. This is the case of the Murs à Pêches, an area that evolved into a semi-protected site through generations of use, access, and preservation.

Material heritage within a heritage site can come in the form of built landscapes, architecture, or archeological or geological sites. Many protected heritage sites come from certain developments such as forestry space, works of art, or industrial heritage involving tools, instruments, machines, buildings, or other structures. Murs à Pêches, for example, contains all of these. At the same time, we also need to consider intangible heritage in the form of art production such as music, customs, performances, and tradition. Other relevant components of intangible heritage are food, tales, testimonies, knowledge, and technical know-how that arises on site. Both tangible and intangible forms of heritage are usually prolonged and preserved for many generations and eventually tend to become a public or common good. In some cases, with a collective governance scheme, they transform into a commons encapsulating material and/or intangible heritage items in a site, as happened in the case of Murs à Pêches.

4.3.1.2 Geographical Location

The walls date back to when the Murs à Pêches first existed several centuries ago. They have the peculiar function of producing peaches, a fruit that is somewhat uncommon in that region. Generations of nearby residents learned that peaches could grow very easily and efficiently on these walls. The micro-climate in which the Murs à Pêches sit in is generated by a network of walls. These walls, which are made of gypsum, take in and store the heat that is recuperated by sunlight in the day. Then the heat gets released during the evening to protect the peaches from radical changes in temperature. This process enables the peaches to grow very easily and reliably, and it is a method that has been working for generations.

Today, the space is used as a hybrid between natural purposes and cultural ones. It serves mostly as a natural space in the middle of a very densely populated and built-up urban area which has the added advantage of being easily accessible. Therefore, it can be perceived as common space for all nearby residents and adventurous Parisians. In addition to the peaches, a variety of vegetables and fruits native to the region are grown throughout the site's grounds. Much of the techniques used to grow these fruits and vegetables are derived from practices that have been present on the site from past generations. The techniques are now taught by the urban agricultural school of Versailles, which specializes in reviving past techniques of horticultural farming. That expertise is considered to be a work of heritage that is being refined into the functions of the Murs à Pêches today.

Since the site is vast, green, and mostly underdeveloped, a lot of developers and speculators have eyed this space as an opportunity to jumpstart projects of urban development. Such actors want to transform the space into housing, an area for transportation facilities, and recreational activities at the expense of saving this natural space as a heritage site. There is now a major struggle between these developers and the residents who use the space as it is now. The conflict has mobilized the residents into a fight to preserve this space against urban development and urban sprawl. Many residents have started to organize themselves in trying to deter these developers and so allow the site to be preserved once and for all. As of today, the community around the Murs à Pêches has formed collectives and associations representing the residents' demand to keep the space protected from urban development. The role of these associations is to engage in an ongoing political struggle and to fight for preservation.

Because the site is defined as a mix of cultural and natural phenomena, there are several forms of property rights that vary between private, public, and collective. The mix in the distribution of property rights only makes the residents' resistance struggle more complex and difficult to win. It was therefore very hard for the residents and associations to find a tactic that worked, which would validate their argument in favor of preserving the space. In 1993 the collectives organized around the Murs à Pêches decided to launch a festival that was completely self-managed. The festival would host a series of cultural events and mobilize a large population to join the political struggle. The festival continues to grow annually today, illustrating the popularity that this space has

benefitted from for a while now through the mobilization of residents and citizens. In other words, the festival spurs several community initiatives and thus serves as a vital event to make the space visible to the public. Consequently, the festival is considered as one of the key tools for the preservation of this space and as a tactic used to win the political fight for its preservation.

4.3.1.3 Historical Background: The Problem of Private Development

The beginnings of the Murs à Pêches date back to the 16th century as a massive agricultural zone on the outskirts of an emerging Paris. The space developed over the years as a producer of peaches and other agricultural products essential to the livelihoods of Parisians. The space was marked by individual parcels jointly owned by various farmers, peasants, and communities at the time. The main towns of the Murs à Pêches were Bagnolet and Montreuil, but the space stretched all the way north to a town called Le Bourget, a distance of 12 kilometers. Both Montreuil and Bagnolet were completely engulfed by these long plots of lands which were surrounded by white walls three meters high and running mostly in the north-south direction.

The peach walls were constructed at the beginning of the 17th century in order to grow peaches on a relatively large scale at the time. The method of cultivating peaches on a wall continued for a few centuries thereafter, reaching its peak in the 19th century. At that point, the Murs à Pêches became internationally famous, with Russian tsar Nicolas II, known for loving peaches, taking major note of this and marking his effigy in the territory. Montreuil became famous for its peach production during that period.

After the 19th century the Murs à Pêches started to decline in the wake of the Industrial Revolution, where many parcels were demolished and replaced by factories for manufacturing and refining raw materials. There was also the emergence of the railroad industry contributing to the decline of the spaces within the walls. The railroad made it economically more beneficial to produce peaches in the South of France and transport them to the Parisian market through freight trains. At the time, the industrialization of the French economy paved the way for specialized territories of certain products. This was especially the case for fruits and vegetables, which were mass-produced in the southern regions. With spreading urbanization alimentary production of produce for local markets

declined more generally. The peach production of the Murs à Pêches thus became increasingly obsolete. During the 20th century 600 kilometers of walls, which in 1870 had covered more than 75% of the commune, were inexorably torn down. Only 37 hectares of peach walls remain today.

The process of urbanization crowding out the peach walls got exacerbated particularly in the 1970s, when the Paris suburbs were seen as available land to develop large-scale housing for workers commuting to Paris. The large-scale housing projects were exported into the outskirts of Paris to accommodate the large influx of people and meeting the high demand for housing in the Paris region. Because of these rapid changes, heritage sites such as the Murs à Pêches and the surrounding neighborhoods were being threatened by these public housing projects. In response, local residents gathered together to start an association defending the integrity of the neighborhoods called ADHM (Association pour la Defense des Habitants à Montreuil). Its creation was designed to halt the imposition of economic development zones in the area. At one point the association successfully fought a public-urbanism project by getting a 17-hectar ZAC (i.e. industrial development zone) cancelled. This local citizen mobilization directed public attention towards the preservation of the Murs à Pêches.

By 1994 there was renewed interest in preserving green spaces, especially when all the areas in Montreuil had been getting rapidly urbanized. As a matter of fact, 80% of Montreuil was classified as a zone to urbanize, threatening the existence of natural spaces such as the Murs à Pêches. A defense group for green areas was formed to protect the Murs à Pêches, and this eventually led to the creation of the Association des Murs à Pêches (MAP), one of the key players in the political fight to preserve the space today (https://mursapeches.blog). It was at that point that tables were turned, fueled by a motivation to slow down the development of urban areas and conserve spaces that were considered 'green lungs of the area'.

In 2003, 8.5 hectares of Murs à Pêches became classified as a heritage site protected by the Ministry of Environment's 'sites and landscapes' classification. The major reason for its protection by the ministry was, because it was perceived as a very unique area in France in terms of heritage and landscape formed by its horticultural past. Through its protection, the landscape was restored and maintained. The Association des Murs à Pêches went a step further in protecting the site, by

making a call for projects for the occupation of its plots. The call for projects was aimed at fifteen associations which were selected to receive social mutual aid, shared property ownership of collective and private gardens, providing make-shift furniture that fit the personality of the place, and an open-air associative theater hosting shows for interested inhabitants. In 2009, the renowned landscape architect Gilles Clement visited the Murs à Pêches and said in the wake of fears this place would get developed, "the endangerment of the walls, and therefore of Montreuil's most remarkable landscape identity, coincides with the abandonment of the practices that justified their existence. The question that arises concerning the durability of the landscape of the walls amounts to asking the question of the durability of the uses" (https://mursapeches.blog/qui-sommes-nous/documents/). Even with these protections, the Murs à Pêches were at constant risk of being developed for housing projects. In 2011 a new call for projects was launched for associations in response to a Local Urban Planning Plan that was introduced that year by the municipality. The Local Urban Planning Plan was instigated by the municipality, which classified the area as a space to be used for construction. The Association des Murs à Pêches fought this plan by lodging an appeal to the Ministry. MAP succeeded in having the Local Urban Planning Plan cancelled in 2012.

In 2014, municipal elections took place, and the newly elected officials wanted to make more of the heritage site available for development of social housing, recreational services, and transportation services in order to accommodate the development of the "Greater Paris Network." As a result, another Local Urban Planning Plan emerged in 2015, allowing the zone to have construction permits as long as some small-scale parts remained protected, particularly the parts that are still classified under the 'site and landscapes' classification of the Ministry of Environment. Only a quarter of the surface was protected. One hectare has been planned for demolition to make way for a future tramway garage.

Another key development in this urban plan was the rehabilitation of an old factory within the Murs à Pêches and converting it into housing. The rehabilitation would require removing all of the soil pollution caused by the production processes of the old EIF factory. A recent report documenting the site's extensive pollution damage was sent directly to the municipality. The neighborhood associations were never allowed to see the report's findings before being told that

they would have to abandon the space. The EIF redevelopment project would then be undertaken by Bouygues, a giant construction company involved in lots of projects for the Greater Paris region. Bouygues, which received a subsidy by the government and won the Greater Paris call for projects, had already proposed the construction of housing in the Murs à Pêches without consulting the residents of the neighborhood. It is clear that the Bouygues project does not favor the residents' priorities. The state's strategy, rather than aiming to preserve the soil from urban sprawl, instead switched to financing destructive real estate projects and even the clean-up work that should be the responsibility of the private actors having caused that environmental damage in the first place. Associations want the Ministry of Ecology, Sustainable Development and Energy to set up a steering committee bringing together government representatives from the region, department, and town, together with residents, users and associations, to discuss the EIF project and the future of the listed site of the Murs à Pêches.

The fight to preserve the space continues today, and the associations are determined to preserve the remaining thirty-five hectares. For associations, like the Association Lez'arts Dans Les Murs (https://www.facebook.com/LezArtsDansLesMurs), one of the ways to save the space from development was to occupy and use the remaining plots of the entire site. To come up with a coordinated plan for such actions, the associations grouped together in 2011 and made collective decisions as to who would occupy the plots and for what purpose. These occupations continue today, as do the tensions between the associations and the municipality.

4.3.1.4 The Commons Approach as a Solution

Several measures were taken to bring the preservation of the Murs à Pêches to the attention of the surrounding community. Observing past actions of mobilization yielding coordination schemes that gathered associations together, there was a broader coordination effort bringing together twenty-nine associations to maintain green spaces around Paris, the so-called "Coordination de preservation des éspaces verts et publics Ile-de-France" (CEVE) (https://sites.google.com/view/ceve-ile-de-france), as recounted by Fabienne Marion (2017). But the political struggle surrounding the future of the Murs à Pêches required a more targeted and

activist approach than CEVE's large gatherings and focus on sponsoring urban development projects that would accept co-existing with strategic green and/or public spaces.

A key step in that direction was to assemble a major support network of associations and organizations that have some relationship to the space already, starting with the Association des Murs à Pêches (MAP). There was a need to implicate residents directly, and MAP's call for projects specifically mentioned that inhabitants must be directly involved in the transformation of spaces and that projects selected should foster the empowerment of civil society. It did not take long for this activist orientation to bear fruit. Open letters were written to the municipality to demand the protection of the space and the halting of a re-zoning exercise which would have provided the legal grounds for private developers to destroy the place. To accentuate the value this place has to the community, MAP organized a festival that was completely self-governed by the members of the federation and of the community. The enactment of this festival has made it more complicated for the municipality to sell the land to private developers. All of these actions have caused a great debate on how this space will be preserved in the long run. This debate was made possible by actions of commoning that the community of the Murs à Pêches did to fight for its preservation. Those actions of commoning will be explored in the next section below.

4.3.1.5 Ecosystem Services

The urban commons provided by the Murs à Pêches falls into a similar category as that of a typical urban farm. But the heritage site adds several other dimensions to ecosystem service provisions. Because of the cultural heritage involved in the Murs à Pêches, one can claim that crucial ecosystem services come from a heritage site as a commons. Ecosystem services arising from cultural landscapes are defined by Harald Schaich, Claudia Bieling, and Tobias Plieninger (2010) as 'cultural ecosystem services' providing non-material benefits to people or communities in the form of spiritual enrichment, cognitive development, reflection, and aesthetic experiences, which create human ties with natural surroundings and play a crucial role in making humans feel tied to their surrounding natural environment.

One important cultural ecosystem service is based on the spiritual attachment humans have with a cultural landscape, using their perceptions of the space to benefit from a strong attachment to the natural and cultural aspects of the space. That attachment encourages communities to use such a space and preserve it in a sustainable manner. In return, humans develop a cognitive understanding of the importance nature has on people's lives. This notion leads to the second benefit based on cognitive memory and cognitive liberation by being a part of the cultural landscape. The cognitive development cultural landscapes create for humans are formed through an understanding of environmental history and long-term historical transformations underlying present-day perceptions of the environment at hand (Schaich et al. 2010). The cultural landscape also may yield personal and collective cultural constructions rooted in the participation and knowledge that gets developed by being a part of the space. These developments can also be enhanced by surveying and mapping the key characteristics of that cultural landscape. Such tactics feed off of a long tradition of landscape-based heritage and nature management, planning, and design. All of these notions create a stronger bond between humans and nature that is beneficial for human development and culture, all while incentivizing humans to protect the nature they become a part of. The space also provides opportunities for recreational activities, a vital asset enriching the quality of life in the neighborhood. Having greater ability for recreation provides humans with things to do in connection with nature. Recreational activity is considered to be a major source for improving the overall mental and physical health of people.

Other key ecosystem services that arise out of cultural landscape like Murs à Pêches are based on aesthetic experiences of a neighborhood and what those may bring to communities. Landscape management practices such as those found within the Murs à Pêches enhance aesthetic qualities as well as the unique character and visibility of the cultural heritage of a particular place. Therefore, improving aesthetics of a neighborhood is key to the cognitive development communities will have with their surrounding natural space (Bell and Apostol 2007). They also increase the quality of life within the neighborhood. Since the aesthetic component of ecosystem services is often based on increasing the natural attributes of a space, that leads to an increased amount of biodiversity in a given area which has several ecological advantages mentioned elsewhere in our case studies.

With regards to the Murs à Pêches, there are key ecosystem services that the site creates to improve the biodiversity of the general Parisian region, particularly in Montreuil. The implementation of associations' practices in the Murs à Pêches include the increase of wild plants that are native to the region on site. All of the notions of gardening taking place on site also improve biodiversity through the cultivation of plants. This also includes the production of peaches which has been taking place in the area for many centuries.

Some of these ecosystem services are also constructed by the communities themselves, especially since some initiatives involve the creation and construction of ponds and other planted areas. The creation of a pond creates a natural basin for water, which feeds the increased biodiversity in the area. Having such a natural hub in a densely populated urban area also offers other key environmental advantages. For example, there is a space that serves as a carbon sequester in the area, purifying the air and cooling down the temperatures of the neighborhood. These ecosystem services will prove to be vital, as the city tries to reduce its pollution levels.

4.3.2 The Community and its Partners

Being a legendary historic site currently threatened by urban-development plans seeking its destruction, the Murs à Pêches has mobilized a large array of community organizations committed to its defense. This defense includes developing alternative uses of the site that can benefit local residents, and mobilization of the community has pushed into that direction.

4.3.2.1 Creation of the Fédération de Murs à Pêches

When the associations grouped to together in 2011 for a collective action plan to preserve the Murs à Pêches, they set up an umbrella organization they called the Fédération de Murs à Pêches. The FMP comprises fifteen associations, all taking active part in the political struggle, and continues to expand today with additional partnerships. The purpose of establishing such a group is to gain support while coming up with a coherent plan together through dialogue between various associations composed of different groups and uses of the space. The dialogue will be based on finding solutions to preserve the space all together. By having all the associations enter into dialogue with each other, the entire group can create projects within or around the Murs à Pêches

and organize events collectively. By deciding on the common goal and the mechanisms to achieve that goal, the associations can collaboratively monitor the site and its varying activities while also coming up with rules of enforcement that lead to the preservation of the space. Their collaboration allows the associations to confront the authorities with a stronger message and find legal solutions. This will steer the management of the space towards a commons through a collective governance scheme.

Information on the FMP is presented on its site (https://federationmursapeches.jimdofree.com). Given their variety and complementarity it is worthwhile taking a brief look at the fifteen associations grouped together in this federation. They are a meaningfully representative sample of what the "Social and Solidarity Economy" can look like when being actively constructed. And at the same time, together these fifteen organizations also indicate the richness of the Murs à Pêches site as a unique kind of urban commons which is well integrated into the SSE by connecting this multi-purpose site with many local non-profit actors.

4.3.2.2 The Composition of Fédération de Murs à Pêches

Take, for example, "Le Fer à Coudre" (https://www.feracoudre.com/nos-lieux/les-murs-à-pêches/), an art production company with an objective of reframing the public's relationship to art. Besides producing forms of studio art, Le Fer à Coudre also performs theatrical scenes. Another Montreuil-based association is "Ecodrom" (http://ecodrom.org), created in 2010. Because part of the site is occupied by a camp of Roma people, Ecodrom seeks to integrate them into the common objectives and participatory processes of the Murs à Pêches while also learning from their cultural lifestyle and technical know-how. The association works with the premise that the Roma's integration can be facilitated through access to work, housing, health services, and educational services for the kids. A theatrical association created in 2008 and called "Théâtre de la Girandole" (https://www.girandole.fr/theatre-de-la-girandole/) offers theatrical art projects that are multidisciplinary, including dance and music sessions. The aforementioned "Lez'arts Dans Les Murs" (http://lezartsdanslesmurs.com/), created in 2003, operates a parcel in the Murs à Pêches as a shared garden and usage laboratory allowing residents to use the space for collaborative use and experimentation. The association promotes several additional activities in the Murs à Pêches

devoted to education, social-cultural purposes, and political engagement. "Les Racines en Villes" (https://racinesenville.wordpress.com), also created in 2003, explores different techniques of urban agriculture and planting. Its members aim to show the value of preserving the Murs à Pêches through all of the natural biodiversity this site brings to the neighborhood. "La Régie Oxy More" (http://laregieoxymore.wordpress.com/),

established in 2015, helps with the organization of get-togethers and parties of activists by setting up dance floors and other social-interaction constructs throughout the Montreuil district with recycled materials.

Another association is called "La Graffiterie" (https://www.graffiterie.fr/reseau/) and it focuses on legal street art done by inhabitants as collective groups to valorize the culture of public space and urban street art. "Le Sens de l'Humus" (https://senshumus.org) was created in 2006 with a focus on experimental gardening and a strong message on the sensitization of agro-ecology and permaculture. Much of its work is also focused on composting and reusing organic material to create permaculture. "Fruits Defendus" (https://www.facebook.com/AssoFruitsDefendus/), created in 2018, started its presence in the neighborhood with a collective clean-up of a parcel about 8000 square meters large. After the clean-up, members of the association planted an orchard and installed a pond, all while favoring the increase of biodiversity in autonomously natural ways. They continue to be active in creating spaces of biodiversity in the Murs à Pêches today. An association referred to by its acronym T.I.G.E, for "Travaux d'Intérêts Généreux d' Extérieur" (https://www.helloasso.com/associations/tige), consists of three visual artists who are passionate about landscape art through the use of gardening tactics. For several years they have volunteered to support the production of such LandArt on the site of the Murs à Pêches during various events involving residents trying their hand on such nature-based art production. Created already in 1991, "Le Jardin des Couleurs" (https://www.facebook.com/ateliersdelanature/) involves a space east of the Murs à Pêches where its members collect dye plants and develop horticultural practices using these dye plants on the site. The association called "D'un peu plus pre" (https://dunpeupluspre.wordpress.com) was created in 2011 with a focus on developing technical know-how of recycling and alternative means of employment through gardening and self-construction practices.

The oldest association in the FMP federation is called "La Société Regionale d'Horticulture de Montreuil" (www.srhm.fr), dating all the way back to 1878. SRHM hosts classes of gardening and permaculture in general through techniques dating back to the 17th century. Its goal is to keep these techniques alive as heritage so that the knowledge obtained from these techniques does not fade away. Classes take place every Friday afternoon, and SRHM uses the Murs à Pêches site as a space of experimentation.

As we already mentioned earlier (in section 4.3.3), a key player in the FMP federation has been the "Association Murs à Pêches" (https://www.rempart.com/rempart-lassociation/le-reseau-rempart/nos-associations-locales/asso/68_association-murs-a-peches/) which was created in 1994 at the beginning of the political fight. MAP's main focus is oriented towards the conservation efforts of the Murs à Pêches by promoting public awareness and generating a widespread consensus to keep this space intact. MAP also administers a shared garden that is open every Sunday during the afternoon to promote the space even further. Another important association is called "La Factory & Co" (https://m.facebook.com/lafacto/) which was set up in 2015 to focus on participative architecture with an economic structure based on the "Social and Solidarity Economy" in several of its projects. Its members take occupied spaces and create participative practices to repurpose those spaces, and they have a fablab for self-construction and a collective cafeteria. They are a key player for the federation, because they provide many commons-based tactics for all of the local associations to attract the public and organize events.

4.3.2.3 Relevant Partners

Our listing of the federation members reveals a mix of different associations each of which has its own purpose. But they all share the common interest to preserve and maintain the Murs à Pêches for their own reasons and for the general interest of the neighborhood. Some of them focus on the cultural aspects of the site while others are more concerned with the natural or ecological aspects of the space. By combining these two orientations together under one roof, the federation is able to mobilize a wide range of support in its political fight. This makes its arguments in favor of preserving the space stronger and more convincing. Such a collaboration effort is synonymous with the idea of a community all working towards protecting and governing a commons.

Other partners in the neighborhood have also expressed their support in this political struggle, and are considered to be separate partners of the federation. These partners include "Le Jardin de la Lune," "Le Café Social," "La Collecterie," "Quatorze," "Les Pierres de Montreuil," "La Montreuilloise," "La Parade Métèque," "Le Verger de Patrick Fontaine," "Le Rucher École de Montreuil," "Le Miel de Quartier," "Le Cirque Aliboro," "Vivre les Murs," "Le Jardin d'Alice," "Rêve de Terre," and "Association Aurore." All these cooperatives and collectives express support for the preservation of the Murs à Pêches, especially to the extent that they use the space for their own economic or associative activities. They all participate within the framework of a commons, especially in their open dialogue with other partners in the collective decision-making of how this commons will be preserved.

4.3.3 Commoning as a Driver of Collective Governance

Here too we have a case study of varied and parallel commoning activities which together provide the foundation for securing the long-term survival of a strategic urban commons with the help of a collective governance structure. While there are a great many acts of commoning by a large number of associative stakeholders, it is the annual festival on the Murs à Pêches site which has given all these engagements and mobilization efforts a central anchor. The reputation of this event, extending far beyond the geographic confines of the neighborhood, not only motivates its recurrence, but has given this cultural commons added protection against administrative and commercial threats to its very existence.

4.3.3.1 Tactics for Community Involvement and Exploratory Walks

Some of the events within the Murs à Pêches come in the form of exploratory walks where the residents of Montreuil can discover the intricate spaces of the site. The exploratory walks are harnessed in a participative promenade event called "Les Routes de Partage" (https://observatoire-du-partage.org/route/marche-exploratoire-dans-les-murs-a-peches/). The objective of this initiative is to provide strolls along a previously defined path with several different participants. The participants also fill out a questionnaire, which is an activity that provides a link between the inhabitants and the space through a form of commoning. Activities are done before

and after the walk, and they are based on collective reflections and discussions of the surrounding environment, all while proposing several solutions to local problems. Such a process is also a form of commoning that helps building relationships, includes participants in the collective decision making of redevelopment, and makes them a part of the space itself.

Several associations host these exploratory walks, particularly Quatorze, and Cités de Hospitalité. The walks are conducted to introduce the public to the vast variety of activities and spaces that are on site. It allows different audiences to share their individual experiences within a natural space in an urban setting. This creates a collective experience with potential to improve the space in a co-constructed manner and offer a tool for the analysis of shared spaces and policies governing those spaces. This collective experience also binds participants in their daily lives, which strengthens the community in general.

"Les Routes de Partage" of 19th of May 2019 brought together several inhabitants in a plot of land in the Murs à Pêches that was inhabited as a shanty town and is currently in a process of transformation. The program of this day was based on field visits, workshops divided into informal and formal habitants within the Murs à Pêches, and collaboration based on local actors sharing knowledge and technical know-how of the space concerned. It was designed to put into perspective the ongoing transformation, showing that the inhabitants of this plot would be rehoused in better conditions and the plot would be transformed into a common space. The motive of the Quatorze collective   (https://observatoire-du-partage.org/route/marche-exploratoire-dans-les-murs-a-peches/) is to integrate the inhabitants of the shantytown in the overall planning process for the redevelopment of the Murs à Pêches. They would be integrated in a participatory fashion to contribute in the planning of cultural events.

Other inhabitants, including participants of the "Les Routes de Partage," also become involved in the participatory process of redevelopment. The result is a mesh of different public groups who have the opportunity to create social interactions and collective reflections around how the Murs à Pêches will be transformed so that the space remains a strong representation of the diversity of users, while meeting all needs and developing cultural ideas.

One of the key objectives of the overall collective organization of the Murs à Pêches is to host events for its nearby residents and make them a part of the participation process taking place on site. Several examples of such projects of integration can be identified. One is located within the plots of the Jardin Pouplier run by the association called Sens de l'Humus. This organization host gatherings in its plot of land several times a week and invites residents to learn about the horticultural process taking place there. The association's responsibility during these events is just to supervise. These gatherings are a way to maintain the plot of land and integrate people in its operations. The association sells flowers while opening its plot to the outside world.

Associations such as Bribri and D'Un Peu Plus Pre also manage a refreshment bar within another plot of land to keep a lease intact that allows them to stay within the Murs à Pêches. This refreshment bar also contains a small vegetable garden and a bread oven. In order to maintain this lease, they organize events such as concerts that are open access to the public. These events allow residents to contribute to the enrichment of the plot of land with money generated from the bar. The concerts entice the public to come in the first place.

Another association is the Lez'Arts Dans Les Murs whose events center around educational activities for middle-school students from nearby schools of the neighborhood. The events are based on gardening and learning how to plant and remove seeds. They are hosted and monitored by members of the association. Other activities are more recreational, such as football and other sports. In addition, homework help is offered by the association, which serves as a support system for kids who have difficulty keeping up with the curriculum. There is also an end-of-year show organized by the association in which the students are the actors. All of these events imply that the association integrates itself with the schools to become a part of the neighborhood, while providing spaces of recreation and learning to the students in return.

4.3.3.2 Co-Production of Physical Assets

One of the key acts of commoning taking place within the Murs à Pêches was the co-production of physical assets by community members. Co-production activities include producing fruits and vegetable in parcels set up for micro-farming, gardening that was used to emphasize the cultural

heritage of the place, natural landscaping for aesthetical purposes, restoration work, doing installations of different art pieces, planning artistic performances, and the re-using and recycling of materials on site.

Co-production of physical assets comes in many forms in the Murs à Pêches. The first one to mention is seasonal wall restoration which must be undertaken every year at the right time. During the winter months, the weather conditions do not allow the peaches to grow, and the use of the gardens can really only be done in good weather. After the winter period, in March and April, several users of the Murs à Pêches enter the site to restore the walls and ensure that the peaches can grow without technical problems. The restoration process requires the walls to be cleaned up from any dust and dirt that has developed over time. The restoration process relies on traditional building techniques through volunteer action and public funding. Some of the parts of the walls may also need to be repaired. When the walls are restored, the peaches can grow through the walls' original function and the space can start to accommodate the public more reliably. Such restoration work requires the networks within the Murs à Pêches to collaborate with each other so that each parcel containing walls can be restored simultaneously.

One of the key partners of the federation using the site, called Murs à Fleurs, has started to develop a horticultural farm project, reviving in the process a fallow plot of land in order to jumpstart a local production and distribution chain for flowers grown in the open-air space of the site. This requires cleaning up and fertilizing some sites, which is done without the use of chemicals and pesticides. A physical asset co-produced in this process involves the creation of biodiversity-based trails and the renaturation of plots sitting on fallow lands. This allows the implementation of micro-farms and revegetating certain areas while also reviving the notion of a horticultural heritage prevailing in the Murs à Pêches' past by installing green roofs, facades and walls, and transforming the area's wasteland into productive land usable for agricultural projects. Such co-production to transform certain previously unusable sites into sites of vegetation and co-produced horticulture depend on the approval of the federation.

A key tactic of commoning aimed at preserving a space involves their occupation. For example, one of federation's first actions as a collective group involved the launch of a call for action

involving occupation of several plots in the Murs à Pêches. This call was aimed at various associations that perform art, display art, or display tactics of horticulture. The idea was to combat the local urban planning plan by having various associations occupy the space and display their use of it in order to fight the notion that the area could now be classified as naturally destructible. Several associations occupied spaces to restore the walls and maintain them. Restoring walls required reoccupying the gardens and placing their activities inside the plot in order to display it or use it for the public.

The Association Lez'arts Dans Les Murs, for example, occupied several unused plots to proceed with its art installations and associative activities. To them, it was a call to save the space and produce art for the community. La Régie Oxy More cleaned up a space damaged by pollution for its own activities, while sharing the space with other associations. Occupation improves the resiliency of a space through a collective bottom-up approach. Space occupation comes with collective maintenance. Hence the process involves much more than just taking the space for yourself. It involves cleaning it up, performing specific acts of maintenance, and sharing the space with others. This allows the Murs à Pêches to have a positive effect on the neighborhood as the city does not need to renovate the space or maintain it. Instead the associations fill that role, and they do it with simple collective tactics.

These interventions by the associations have caused the municipality to take note of their work and the benefits they provide to the community of Montreuil. Patrice Bessac, the mayor of Montreuil, has acknowledged the site's evolution to becoming a commons and has given financial, material, as well as human support so that the projects are officially recognized beyond the borders of Montreuil. The Ministry of Culture has shown support for these initiatives as well. It was decided by the state to provide occupancy agreements to the federation and other involved associations for a period of twelve years, thereby supporting the development and preservation of these undeveloped and natural areas. Patrice Bessac has tried to integrate the Murs à Pêches as a commons into the Greater Paris development project, ensuring that this agricultural site can be turned into a sanctuary through the protection of natural, agricultural and peri-urban spaces. Areas such as the Murs à Pêches will then be protected by the authorities. The plan is to have any future change in the Murs à Pêches submitted for a review to the Chamber of Agriculture and the

Departmental Commission for Agricultural Orientation. In such a protective measure, developmental changes would have to get authorized on the basis of a decision by these governing bodies, which provides several key protection measures to save the Murs à Pêches. Such an achievement was made possible by the dialogue between the associations and the municipal body. This shows how tactics of commoning can help local authorities become facilitators to the commons in legal measures. While this arrangement is not permanent, it still provides enough ground for the commons to exist and be a part of the neighborhood in the future. Commoning has proven to be effective here.

Through these observed space occupations, we can reaffirm conclusions that were also made by Damien Deville and Florence Brondreau (2017). With so much political pressure threatening the existence of a natural space in such a developed area, commons-based initiatives often take root in brownfield or underdeveloped areas that are typically suffering from neglect. They get reinvested by the commoners who occupy the places in an official or spontaneous manner to build real projects in territories that are officially recognized by public authorities (Poulot, 2014; Demailly, 2014). Cultivating the city therefore requires a certain level of collective participation in a process in which citizens, individually and collectively, re-appropriate urban space and strive to co-construct forms of development, management, and sharing.

4.3.3.3 Conflict Resolution

Since there are several groups of people assembled together in pursuit of this common initiative, there are different interpretations on what should be done to restore the space, host events, and engage the municipality to gain its support. In other words, each group of people has its own priorities, and with that arises conflict. The tension can start just with the occupation of plots between different users. Some gardeners have more freedom and space than others to plant their goods. Tensions may arise between groups that have gardens for their own purposes, which means that the gardens come in different forms. Some are simple vegetable gardens, others are experimental permaculture gardens, while some are for species conservatories, and others are used to accentuate the cultural heritage of the space. With such diversity gardeners end up with different

priorities, and then it becomes crucial for the federation in general to manage the tension that may arise out of this process.

The key tension concerns the question whether or not to open the spaces up to the public. Because several gardens are used to preserve the biodiversity, some groups believe that the Murs à Pêches should have limited access. Those gardens used for art and displays of cultural heritage believe that the space should offer open access to all in order to spread consciousness about the place. By exposing the outside world to the land art, cinemas, concerts, and theaters of the area, some gardeners consider the inclusion of the public a nuisance to their own activities. This tension continues to date.

One of the key ways the federation handles such conflict is by hosting meetings to address the tensions. During these meetings, each association has a voice that it presents to all the other associations, explaining why they may be against certain decisions. With each voice heard, details are explained about how to separate physically certain gardens from the public. These details can be negotiated for the overall betterment of the spaces as one collective entity. With a goal of easing tensions, these meetings have a clear agenda. Conflict resolution is an objective for everyone which results in a great level of understanding among the different groups. Many of the meetings thus manage to reach their goal of decreasing tensions by finding solutions that fit all objectives. Separating certain spaces while keeping some open to all is often what results from these meetings, and some gardens are closed off to the public. Such conflict-resolution meetings have so far demonstrated an impressive capacity to find solutions to the conflicts concerning use of the space. If such negotiations do not work, the people of the meeting will resort to a voting system. The meetings are often led by people who know each group well and can find ways to support one group without ostracizing the other. The mechanisms and tools that the federation has set up during these meetings allow tensions to be managed without conflicts deepening to the point of impeding the overall goal of preserving the space.

4.3.3.4 Dialogue with the Municipality Through Open Letters

One of the ways in which the federation engaged in a dialogue with the municipality was by going to the townhall meetings and expressing their concern for the new development plan. In order to combat this plan, they provided a whole list of actions that the associations have taken to render the space usable to the public. They also showed the value of the site by bringing up the cultural heritage and the natural elements that the space brings to the community. They argued that in order to improve the quality of life this space remains imperative. It should not be in the hands of private developers, but instead a place of deliberation for the community.

One of the key tactics used to engage in this dialogue was a collective process of writing an open letter to the candidates for the legislative election as a measure of winning support by defending the territory. The open letter arose from a collective decision-making process among the associations and the residents in terms of what needed to be mentioned to carve out a collective argumentation in defense of the space. The letter started by mentioning the generations of heritage that this space has developed culturally and naturally, referencing historical collections and documents as proof that this legacy ought to continue into the 21st century. Then the letter laid out all of the micro-plans which this collective group had undertaken to manage and maintain the space. They explained the processes of restoration which some associations had initiated to make the space more inviting. They illustrated the processes of co-production to ensure the revival of abandoned plots and all the clean-up processes making these plots usable for agriculture. They also showed their strong ambition for popular education by hosting activities based on performing arts, visual arts, architecture, and new or revived forms of agriculture, all of which contribute to the growing ecology of the site.

To proceed to the next part, the associations called on the local government to provide them with an appropriate legal status and management structure to secure their long-term survival. Such status could best be provided in the form of what the French lawmakers set up in 2002 as a special public-benefit provider known as "Établissement public de cooperation culturelle" (EPCC) which would make it possible to mobilize funding from public sources through sponsorship and partnerships. Such funding would boost the associations who carve out skills, voluntary will, and

historical collections to make this space culturally valuable. But such funding commitments are impossible without public action to save the space from private developers. The letter ends by calling for a meeting to discuss how this project can be protected and properly managed under the hands of the citizens. It was sent to the municipality on May 1st, 2017. The objective of this letter, which was to engage in this sort of dialogue, met a first success when receiving provisional support from the municipality.

4.3.3.5 The Festival

An effective tactic deterring the Murs à Pêches from falling victim to the developers has been the creation of the Festival of Murs à Pêches (https://www.girandole.fr/festival-des-murs-a-peches/), an open access event organized collectively by the Fédération des Murs à Pêches with the local residents of the area. The federation launched the festival in 2003, with the purpose of shedding light on the importance of the site by gathering large numbers of people and having them learn about the social activities and natural processes taking place thanks to the collective organizing of the federation. The decision to host a festival was a collective one. The aim of the festival was to give all those different participating actors the opportunity to organize a series of communal activities accessible to the public. The public would hopefully also become more aware of the difficulties linked to preserving the space. The success of the festival was measured by its ability to motivate these different groups to cooperate and so realize they are working on a space that is a commons for all. That in itself should be considered an act of commoning by assembling all the actors together and hosting a major event for public awareness and state protection.

The aim of having the public come to the site in large numbers during the multi-cultural festival was to show the importance the site has for the residents and so protect it better from the reach of developers. The municipality has already responded to this unique mobilization by protecting 8.5 hectares as a result. The festival happens annually and forges strong networks of citizens who then become motivated to fight for the protection of the space so that the active opposition to development plans for the site's urbanization has increased steadily. Another key element of this festival was to reinforce a social cohesion between all of the federation's member associations and the local residents surrounding the site. The Festival des Murs à Pêches has been going on for

sixteen consecutive years and has brought together more than 3,000 participants to the space. The festival has become one of the largest autonomously organized festivals in France and is proving to be a huge success in aggregating supporters. The key is that the festival has become a tool derived from tactics of commoning to win a political fight.

While the festival remains still unknown to many Parisians, one can see its steady increase in popularity over the years. The first step is recognition of the existence of the space, and then a call to support the space. With its increasing popularity, there is an ever-growing base of support to protect the Murs à Pêches from the reach of property developers. People start to realize how valuable it is to have an associative and natural space located right at the edge of Paris. The Federation des Murs à Pêches has obtained a substantial amount of support to keep this space open and protected with an immense base supporting the pact concluded with the municipality. This level of public support will entice the governing bodies to keep the space as a commons. A key engine driving this political force is the EIF project, which has gotten lots of public attention through the festival. It was, after all, that project which posed an existential threat to the continued longevity of the commons by allowing the developer Bouygues to build housing on the historic part of the Murs à Pêches to compensate for the costs of cleaning up and renovating the old EIF factory. During the festival, the Fédération des Murs à Pêches proposed to all participants to come down with them to the town hall and challenge the legal and social effects of this EIF project. The support was so large that it became one of the largest local political manifestations in recent years. There was a total of 35,000 people on the square next to the Murs à Pêches fighting to protect the space and halt the EIF project. This shows the political influence that actions of commoning, such as hosting a festival, could have in a certain urban community.

In addition, the festival has brought a renewed relationship between the inhabitants and the space itself. People living in the neighborhoods do not necessarily have a relationship with the Murs à Pêches even if the associations try hard to integrate them into the site. Many inhabitants may have memories of childhood, because the space was even freer when they were younger. Today in fact, because of all the modifications the space has gone through over the years, there is a kind of barrier. The festival's aim is to break that barrier. Associative activities organized by the federation allow

residents of the surrounding working-class neighborhoods to re-appropriate the space. This is another important way to gain support.

During the festival commons were discussed as an event forum. And that debate raised the question how to make people recognize what the federation and the inhabitants are doing by thinking of the site as a whole and not just as a set of individual allotments. The federation decided on a political forum for this debate. This forum made space for discussion to think about the future of the Murs à Pêches as a commons. It was at this point that the notion of the commons was implemented in the federation's objectives. Therefore, the federation states that its purpose should not be defined as some sort of centrally coordinated organization, but that each actor takes initiative on their own for a collective purpose and will co-produce with others to achieve that objective. In other words, the goal of the federation is to rely on the actors installed in the Murs à Pêches, and give them total autonomy on what activities or operations they decide to do. They then rely on this autonomy to have each association self-organize and host the public according to its own agenda. Therefore, the management of the festival becomes autonomous, which helps render the space as a commons and lets the actors do their own forms of commoning. On the basis of this autonomy each association has its own programming, which helps the federation focus on other important tasks in setting up the festival, like communicating with the municipality for certain safety rules. This form of self-collective organization is just one more indication that helps identify the Murs à Pêches as a commons in its form of governance.

The idea of hosting a festival has brought several advantages to the Federation of the Murs à Pêches in rendering the space a functional commons. One of the reasons is fully integrating different groups of the community together and having them join the initiative to get legal protection status making it easier to preserve the space. In the radio emission, it is said that the Roma people living in the shantytown within the Murs à Pêches are not really integrated in the collective process and are often ostracized by the rest of the community. With the festival and all the collective processes that take place in the Murs à Pêches, relationships can get developed between the associations, the inhabitants, and the Roma people. Some of these relationships may arise out of conflict. But the idea of the festival is to have an open space of deliberation to allow everyone who is close to the site to come and enjoy it in a cohesive manner. This would also facilitate relationships with the

Roma people creating meetings between the different actors. In other words, the festival can serve as a facilitator of relationship building that would otherwise be very difficult to achieve on a regular basis.

There are therefore a number of spaces in the festival identified as the common space within the commons of the Murs à Pêches to which the coordination of the federation offers a path of support and help. And this commons format helps the festival become more professional year after year. With all of the tactics of commoning mentioned above, the Murs à Pêches presents itself as a strong case study for analyzing contemporary 21st century urban commons. And as a result of these tactics of communing the Murs à Pêches site has developed a greater base of support by the municipalities which aid it in its permanency.

4.3.4 The Charter: A Pact of the Federation

Following the letter, a pact was collectively organized and written up on 22nd of January 2020 by the members of the Fédération des Murs à Pêches in the wake of yet another round of municipal elections. This pact served as an official document showing the cohesiveness of the associations (https://mursapeches.blog/2020/02/28/pacte-pour-lavenir-des-murs-a-peches/) around the need to get public support for their activities. As such it can be perceived as a charter, highlighting five key points for the Murs à Pêches to be collectively preserved and managed as a commons.

The first point was a call on the municipality to abandon the EIF project that would be run by Bouygues. Instead, the associations of La Fédération des Murs à Pêches asked the municipality to engage in efforts of co-construction of the factory with the associations and the actors of the site. An argument was made how this alternative development plan would be beneficial to the community while maintaining the landscape and the public character of the site.

Secondly, the Murs à Pêches would be preserved in its present state without key development projects interrupting the natural flow cycles that take place on the site. This would require the municipality to modify urban planning documents and incorporate actions of co-production by the

citizens and associations. Such a step is key to the cultural development of the space while preserving the natural space so that it can provide ecosystem services to the neighborhood.

Thirdly, the municipality would recognize and institutionalize co-management processes with associations and inhabitants of the general area. They propose that this would be achieved by finally creating a real democratic governance structure – GIP (i.e. Groupement d'intérêt public), EPCE (i.e. établissement public de cooperation environnementale, a new status for environmentally committed organizations created in 2016), committee structure, and council for decision making - and providing the Murs à Pêches thus with a helpful legal structure. Such a structure would enable the federation to design and manage a globally-focused project guaranteeing the sustainability of the site. It would also eliminate vagueness in the interpretation of local policies, making the sustainability objective clearer and more straight-forward. The implied partnership could use the state as a key facilitator of the project, which is a key principle to consider for urban commons and their relationship with legal authorities in cities.

The fourth point of the pact was a demand for rules of transparency and information provision concerning the pollution of the EIF site, which recently has attracted squatters living there, and the progress with the clean-up of this toxic waste site. The local government would commission environmental-impact studies (with expertise and counter-expertise) involving residents and the local associations as well as organize regular public information meetings. This is key for a commons to work in conjunction with the state and will help both parties achieve sustainability in the area while providing ecosystem services that improve the quality of life in the neighborhood. Any level of permanency needs innovative approaches capable of addressing legal concerns of the space.

The fifth and final point seeks to ensure that the Murs à Pêches can be governed in a commons format. Such a governing scheme would help the Murs à Pêches achieve permanency and continue to provide benefits to the neighborhood as a whole. The language used in the Pact introduces the notion of an "open laboratory for ecological, cultural, and social experiences." Having a space for experimentation by the community is a key characteristic of the commons. Based on past lessons, this tactic works in achieving greater sustainability in the area.

The five-point charter shows a solid plan to get local-government approval to save the space and allow the federation to be co-organizers and co-managers of the space. The federation uses a commons-based approach to highlight its arguments in favor of sustaining the Murs à Pêches as a multi-faceted urban commons. They argue in their letter how the activities organized have led to major and incremental improvements of the space through tactics of commoning. They illustrate the importance of keeping this space as a commons, so as to highlight why it would be beneficial for the municipality to follow suit. Most important, this pact is considered to be the legal document allowing the community to engage in dialogue with the municipality, especially at a moment of such importance when officials are about to get elected. The preceding public letter, followed by a synopsis of its contents in the form of the proposed five-point pact, also illustrates commoning tactics of political action to push election candidates into committing themselves to supporting the commons-based initiative of the Murs à Pêches. Of course, it is in this regard advantageous that left-wing candidates do traditionally well in Montreuil elections.

Section 4.4. Concluding the Chapter

In this chapter I have presented three case studies of urban commons for detailed analysis – the watershed commons Bassin Versant Solidaire de Forest as a new vision of community-driven water management for better flood control in section 4.1, the urban resiliency farm Agrocité as part of a broader "social and solidarity economy" initiative known as R-Urban in section 4.2, and the transformation of a historic legacy site known as Murs à Pêches into a multi-purpose urban commons. These are all urban commons of the modern kind, engines of transitional urban resources for improved city life. Each of these initiatives became deeply embedded in their respective urban settings by providing a series of needed ecosystem services, mobilizing neighborhood associations and activists, using charters to secure their standing in the community or relationship with the local authorities, and developing step by step effective mechanisms of collective governance.

While entirely unique in their specificities, they all share enough in common for us to draw useful lessons. It thus makes sense for me to conclude the thesis, in the upcoming final chapter 5, with a

transversal discussion of the differences and similarities pertaining to these three case studies which we have had a chance to study in much greater detail than most of the other examples of urban commons we have made reference to in this thesis.

Chapter 5 – Transversal Discussion of the Case Studies

After clarifying the context of urban commons and the role of chartering practices in their formation in chapter 3, I presented three case studies in chapter 4 with extensive discussions of each of those – the Bassin Versant Solidaire de Forest as a watershed commons on the outskirts of Brussels to address the issue of recurrent flooding in the area, the urban farming site Agrocité in the Parisian suburb of Gennevilliers as part of a broader ecological-transition strategy called R-Urban, and the heritage site Murs à Pêches in the Parisian suburb of Montreuil which an umbrella organization of associations and collectives has turned into a multi-purpose urban commons. On the one hand these three urban commons projects are all very unique, and in that sense quite different from each other in their distinct specificity. On the other hand, they are also sharing very significant similarities with each other, and these shared characteristics are all highly relevant for the new type of urban commons which my thesis has made its main focus of research and analysis here. Correspondingly, section 5.1 shows the similarities that each case study shares with each other. Section 5.2 illustrates the specificities that make each case study unique in its own right. Section 5.3 then uses the case studies to go back to the notion of tactical charters as key tools of commoning. Sections 5.4 and 5.5 conclude the transversal discussion by highlighting the challenges and future implications of urban commons in light of the results and key findings presented in the case studies of chapter 4.

For example, all three projects involve newly created or transformative resources, each exemplifying in its unique way the rich potential of what I have termed (in sections 3.4.2 and 3.4.3) transitional urban resources (TURs). In those endeavors of community-based resource creation we can see how commoning activities play a decisive role in defining and shaping the resources to be turned into commons. All three case studies take root in densely populated urban areas at the margin of cities, in socio-economically challenged neighborhoods. Involvement of local residents, at the center of commoning activities, plays out in each case in a political context of tensions with the relevant bodies of the local government. Each of the urban commons we examined confirmed the importance of charters, which emerged in our case studies in very different tactical chartering contexts. We learned also the great variety of commons-based environmentalism, as each urban commons developed its own unique contributions to facing the challenge of climate change in

cities. Finally, the three commons I studied in chapter 4 all connected organizationally to various aspects of the "Social and Solidarity Economy" with mutually beneficial results. Yet, as we shall point out later in this concluding chapter, the differences between the three commons presented here are equally meaningful to learn from. We are beginning our transversal discussion of the three commons with a spreadsheet summary presented in Table 5.1 below:

Table 5.1: Characteristics of Case Studies – Bassin Versant Solidaire, Agrocité, Murs à Pêches

Case Study Information	Bassin Versant Solidaire de Forest	Agrocité	Murs à Pêches
Geographic Location	Forest Neighborhood in Brussels Region, Belgium	Commune of Gennevilliers in Paris Region, France	Commune of Montreuil in Paris Region, France
Type of Commons	Created Commons from Adverse Opposition to Political Policies	Created Commons that is neither adverse or pre-existing	Old pre-existing commons at risk of being demolished
Objective	Prevent inundations, find a sustainable replacement for construction of a large barrage	Enrich quality of life by providing neighborhood communities with access to resources	Preserve a patrimonial site that has existed for ages against rapid urban development
Getting the Community Involved	Round Tables, Assembly Meetings, Exploratory Walks, Map-it Software	Hosting Social Activities, Conceptual Mapping, Assembly Meetings, Membership Fees	Festival, Exploratory Walks, Hosted Events, Space Occupation
Governing Body	Etats Généraux de l'Eau à Bruxelles	Atelier d'Architecture Autogérée	Fédération des Murs à Pêches
Ecosystem Services	Water & soil management; Inundation prevention; Biodiversity; Pollution control	Food security; Recycling; Carbon sequestration; Plant formation; Community cohesion	Cultural heritage; Carbon sequestration; Plant formation; Biodiversity; Recreation
Physical Aspects of the Commons	Watershed; New urban rivers	Urban resiliency farm; Allotments and shared gardens	Patrimonial Site; Associative plots
Actors/Stakeholders	Neighborhood committees; Local district department ("Commune")	Residents of Gennevilliers; Local 'short-circuit' cooperatives	Cultural and horticultural associations; Residents of Montreuil
Conflict Resolution	Roundtables organized by working groups	Voted-in leaders as mediators	Hosted meetings discussing tensions and solutions

Relationship with Municipality	No support	All support	Logistical support for festival
Type of Charter	"Actes de Naissance"	R-Urban Charter	Pacte Collaboratif de l'Avenir

Section 5.1. The Similarities

When juxtaposing all the elements of each case study, some observations can be generalized as applying to each urban commons. We can compare urban commons based on type and function. These observations and comparisons can form a transversal discussion based on the case studies in this thesis. Such a discussion can provide useful insights into how urban commons function under several different contexts, who is behind the organizational nodes of governance, their various relationships with other local actors, the challenges they face both endogenously and exogenously, and what tools or forms of support are needed to make these urban commons key players in the institutional framework of cities.

5.1.1 Governance

The first similarity between these case studies is that they take similar forms of governance while also sharing tools used to build a collective governance scheme that works. In each case study, there was always an initial collective launching the project and organizing the key meetings. In each instance that initial grouping of activists made it a priority to engage the residents of the neighborhood in the collective activities and decision-making of each commons. This implies some level of hierarchy when it comes to the organization of the commons, centered on collective groupings assuming a crucial role in the management and governance of the commons. The hierarchy is not guided by who has greater access to the resource, but is based on who is vested the most in achieving the general collective interest around the commons.

We can thus identify those groups as the main governing bodies of the commons. For the case of Bassin Versant Solidaire de Forest the main governing body is the EGEB. For Agrocité, it is AAA who provides the general framework and initiation of the collective governance. For Murs à Pêches the main governing body is the Fédération des Murs à Pêches which assembles all the involved associations and neighborhood groups into one major collective. This is a key similarity through

which we can analyze the governance framework and organizational efficiency of the commons as applied to all three case studies.

5.1.2 Environmental Objectives of Urban Commons as "Transitional Urban Resources"

Another similarity is their common objective rooted in ecological concerns. That has to do with the type of urban commons involved here, a type we have characterized as transitional urban resources (TURs). Each case study instituted ecological initiatives within their local context to have an impact on the low-carbon transition reshaping densely populated communities. Each case study is confronted with a major ecological issue within a certain urban context having specific ramifications on the residents in that particular urban area. No solutions by the city's municipality have been found to deal with these ecological issues to the residents' satisfaction, lacking a clear answer as to how to resolve the problem. In such instances of government failure each of the three urban commons decided to tackle the issue themselves instead.

In the case of Bassin Versant Solidaire de Forest, the ecological issue were inundations that flood the low-lying areas of a watershed due to heavy rain. Arranging the governance of a watershed as a commons allowed the residents to provide solutions for inundation prevention while at the same time also making it possible for the excess water to be used as a useful by-product for backyard farming.

In the case of Agrocité, the ecological issue was about adding urban resiliency in a lower income neighborhood in the form of food security and access to ecological resources like recycling. By building a farm in an area surrounded by social housing, these residents would become the main users and up-keepers of the farm through collective management. At the same time the commoners gain expertise in recycling and have access to pesticide-free food that is grown right by their doorstep.

In the case of Murs à Pêches, the ecological issue is preserving a large green space in a densely populated urban area not only for carbon sequestration and biodiversity preservation, but also as a

space where residents can connect with nature while they carry out their recreational, cultural or horticultural activities. Preserving the Murs à Pêches protects a heritage site that has been shrunk by urban development for years, where old horticultural practices are at risk of being forgotten, and whose natural space for recreation also risks disappearing. Murs à Pêches has been a natural hub for the residents of Montreuil for a long time, and the political fight surrounding this commons is about protecting it from further urban development.

All three of these urban commons provide their respective surroundings with a whole host of ecological services that not only improve the quality of life for residents, but also help cities to confront major issues of climate change. Such ecological services may involve the existence of green spaces as carbon sequesters and pollutant nullifiers, provisioning services such as soil and water management, and hubs of biodiversity in heavily built-up areas. These ecological services can then be viewed as tools that can be used by residents to improve the environmental make-up of their neighborhoods once fully established into a collective governance framework of a commons. Ecologically-based urban commons can have an important role to play in how cities prepare for the future reality of climate change, as I have tried to capture with the concept of "transitional urban resources." Since cities all share the need to improve the ecology of their areas, they can count on the commons to be major institutions in implementing ecological solutions for problematic issues such as inundation, food security, or preservation of nature spaces as carbon sinks.

5.1.3 The Broader Institutional Context of Urban Commons as "Transitional Urban Resources"

Another key similarity that all three urban commons share is a relationship with local actors whose support strengthens their common objective and functioning. The local actors are usually other associations or cooperatives, a larger pool of participating local residents living nearby, or the municipalities and other public authorities. In each case study the commons always reaches out for local support and participation.

In our case studies of the Bassin Versant Solidaire de Forest as well as the Murs à Pêches, the governing bodies establish partnerships with neighborhood groups and resident associations to participate collectively in the commons. In each of the case studies we have such a governing body, whether the Bassin's EGEB, the Agrocité's AAA, or the Fédération des Murs à Pêches, which uses its collective governance mechanism to mobilize a range of actors with participatory access rights to the shared commons and distinct responsibilities as to how maintain its resource base. These centrally managed partnerships forge a stronger collective framework that makes the commons more robust and adaptable to the needs of the neighborhood Such forms of participation can also help the commons advance their cause with greater support from the municipalities. Agrocité, as part of a broader bottom-up community-driven social-and-solidarity-economy strategy of urban development known as R-Urban, seeks partnerships that help build short-circuit capacities within a neighborhood. In order to have access to economic tools that help nurture these short circuits, Agrocité has partnered up with cooperatives that are involved with recycling key organic materials, wooden and metal materials, and finished products like bicycles. They together form a network where residents can accumulate funds to keep these systems alive and functioning. There is thus a strengthened relationship between the commons and local cooperatives or professional groups of experts.

These three case studies are clear examples of how urban commons forge a greater network with local actors to strengthen the objectives the neighborhood shares as a whole. In return, the commons provide neighborhoods with greater access to the unique resources they produce in a city context, a new kind of (urban) commons of great relevance for societal change I have suggested to characterize as "transnational urban resources" (TURs). There is thus the chance for a symbiotic relationship between commons and local actors reinforcing each other to improve the neighborhood, providing residents access to both ecological and economic resources. The organizational drivers behind these three projects – the Etats Généraux de l'Eau de Bruxelles (EGEB) of the Bassin Versant Solidaire de Forest, the Atelier d'Architecture Autogérée (AAA) promoting Agrocité, and the Fédération des Murs à Pêches serving as the umbrella organization bringing together a large number of actors seeking to preserve the unique site of the same name – have systematically embedded their commons project in a broader institutional context of partnerships, co-production arrangements, and community-based service provisions which

together promote the "Social and Solidarity Economy." This is the second quality making these urban commons "transitional."

In each of the three case studies there is an effort to gain the attention of respective local government authorities in order to protect their commons and democratic actions within the commons. Besides local authorities they also implicate a host of various local actors to be a part of the governance practices within their commons, and those local actors share similar characteristics across all three case studies. The dialogue between commons and municipalities began in all three instances prior to the chartering being published for this purpose.

For Bassin Versant Solidaire de Forest, the EGEB and its partners engaged with the municipality by inviting officials to their roundtables in order to get feedback from their side all while proposing this project as an alternative solution to the large barrage in the middle of a neighborhood square planned by the municipality in the first place. As expertise and collective agreements were gathered for the installation of new urban rivers, EGEB and its partners published a charter on how this project would be set up and collectively governed.

With regard to Agrocité, the AAA collective had already implemented a project in Colombes, but were kicked out by the municipality to replace their space with a for-pay parking lot. This broken relationship eventually caught the attention of a nearby municipality, not least also thanks to acts of opposition and resistance by local residents, which then agreed to implement the resiliency farm project in its own urban area. Hence AAA could basically move its R-Urban project from Colombes to Gennevilliers, including its urban farm Agrocité, with approval and support from the Gennevilliers municipality. AAA then also published the "R-Urban Charter" to highlight the collective governance schemes of Agrocité and the established partnerships with several collectives and cooperatives in the area.

For Murs à Pêches, the dialogue between the commons and the municipality was in the form of open letters written by several collectives involved in the preservation of Murs à Pêches to protect the area from increased development. These open letters eventually led to the Fédération des Murs à Pêches writing a pact to protect the site for the festival it had implemented. The festival was an

event for recreation, culture, and other activities. But it soon also became a tactic used by the federation to show that this site needs to be protected if it is to keep doing this festival as a cultural event of significance for Parisian residents beyond the immediate surroundings of Montreuil. The municipality has shown support, because it sees the value the festival brings to the neighborhood. This support, however, is at risk of being overwhelmed by constant pressure from large-scale developers. The federation thus strives to continue its dialogue with the municipality to achieve its objective.

All three case studies show a clear relationship with municipalities as a means to gain support from the public bodies that regulate and manage the urban space. They each exemplify the indispensable role of the state as facilitator to allow these urban commons to develop. As those case studies confirmed unambiguously, urban commons must continue to gain support from municipalities if they are to become a decisive actor for cities seeking solutions to their ecological and economic struggles. These examples also all shed light on the political debate of what cities need to do to support their communities and help fight climate change.

5.1.4 Conflict Resolution

One last major similarity concerns finding effective solutions for conflicts that could arise out of the collective governance internally. Conflict-resolution mechanisms are a key feature that all commons must figure out how to implement best, and each of these commons developed its own mechanisms to do so.

For example, the Bassin Versant Solidaire de Forest organizes its meetings through round-tables where each group is assigned a task. That means each working group is responsible for its share of the operational planning and monitoring of the watershed commons. Once the working groups have done their share of analysis and work, all the working groups meet together to discuss their results. And while some results may differ in the execution of the collective arrangements, the overall meetings are designed to find a collective agreement among them to include all the demands and concerns addressed by each working group. The setup of these meetings and working groups is all designed to work around conflicts of interest and come up with a proper agreed-upon

collective approach to setting up the commons together. This in turn avoids or diminishes the possibilities of conflict arising.

In Agrocité, the conflict resolution methods are even more distinct. When you have a multitude of users with different visions, internal conflicts are likely between people within the collective management of the commons. Agrocité's method of handling these potential conflicts is by democratically electing and confirming a group of users who are known for their mediation skills in conflict management. Members of this group engage in constant dialogue with protagonists of the conflict. This elected group is a democratic solution to handling conflicts internally, and the dialogues aimed at conflict mediation have shown to resolve disputes between different users quite effectively. The whole idea of those dialogues is to show that everyone's collectively shared interest should outweigh the conflicting interests, if the commons is to be managed effectively. Based on Agrocité's success in bringing in users from different social backgrounds, this conflict resolution method has worked so far.

In the case of Murs à Pêches, similar tactics to Agrocité for conflict resolution are used, not least because reasons for conflicts arising are similar to those in Agrocité as well. Users may argue over who occupies certain plots. Other users may disagree and/or dispute over whether the space should be closed or open to the public. In order to mediate these conflicts, the Fédération des Murs à Pêches hosts meetings that are primarily designed to discuss the conflicts together. These meetings are hosted by people who know all the associations involved well enough to provide support and feedback in an equitable manner. The meetings also allow each voice and concern to be heard. The meetings have shown to ease tensions, and solutions have been often implemented to move forward. If such dialogue does not work as a solution, the federation has decided to develop a 'last-resort' voting system that would resolve the conflicts based on the support each decision draws. Such a tightly instituted conflict resolution system has proven to work especially when the festival was launched. While conflicts still happen, the different organizations making up the federation have managed to co-exist together, run a festival together, and manage the space as a commons nonetheless.

These similarities allow us to pinpoint common features on how urban commons work when they are effectively woven into the fabric of urban spaces. From our case studies, we can confirm that commons have a special ability to be hubs of the ecological transition, especially because they are very effective in building and providing ecosystem services from the ground up without a large budget or large provisions by the state. If cities are to get serious about transforming the ecology of their spaces, they should do so by supporting commons and coming up with a regulatory framework that favors the viability and longevity of urban commons.

In addition, the case studies show that commons are institutions of collective governance. They all share a certain level of subsidiarity, where the most fragile and undermined portions of the population not only have access to certain necessary resources, but also get to have a voice in how certain resources and space should be managed. Each has an effective method for how to handle internal conflict, which is an important feature for an institution to have if it wants to function well. In all three case studies, there is a main governing body that takes responsibility for launching the commons and its collective governance scheme, implying a certain level of hierarchy through which the commons are organized. This hierarchy, while mostly implicit in the collective governance schemes, demonstrates some level of organizational efficiency that should be taken into account when implementing commons.

Finally, the three case studies demonstrate a relationship with local actors. This is proof that the urban commons have a strong ability to network with partners who act as a strong pillar for the commons movement. The addition of partners helps make the commons become a key sector in cities, following the various principles that are introduced by Ostrom (1990) and Iaione (2015). Partnerships have also been established with municipalities in the form of dialogues and charters. This avenue of communication between the commons and public sector confirms the need to have the state as a facilitator and supporter of the commons, a principle that has been evoked especially by Iaione (2015). Drawing up these conclusions can help municipalities become partners of commons and help commons become key institutions for the ecological transition of cities. The similarities that we draw upon here illustrate how principles discussed in this thesis can be used most effectively as a basis for the success of commons.

Section 5.2. Specificities of Different Urban Commons

Because of their different nature, the three commons presented in chapter 4 are also profoundly unique and hence marked by their specificities. It is not surprising to see that different objectives and/or different types of urban commons result in different character traits. This might also result in differences between actions taken to achieve those objectives. In addition, they all fight distinct political fights, with the range of support they receive from local authorities also varying greatly. Understanding these differences helps us clarify all the intricate practices urban commons share, which in turn makes it easier for us to figure out what methods work in a certain context and which do not work.

5.2.1 Lessons from the Bassin Versant Solidaire de Forest

Bassin Versant Solidaire de Forest, for example, is a completely transformed commons from the ground up, and it faces stiff opposition in its political fight to co-exist with the Brussels municipality and its water regulators. This implies that the resource itself was not perceivable as a commons before, but circumstances allowed it to be transformed as such. A completely transformed commons means that all the elements of what makes up a collective governance scheme of the resource in question have to be built from scratch. It takes a certain amount of research and gathering of information for commoners to be able to build a commons under these conditions. Since the commons is being created from the ground up, experimentation in commoning practices is key to the quality and success of the commons project. As a matter of fact, a functioning governance scheme can only arise from deep processes of experimentation. That has required the EGEB to test different proposals by its commoners, not only for implementing new water devices like the New Urban Rivers, but also to try out new strategies for discussion and decision in assembly meetings and roundtables. In such phases of experimentation, methods of commoning have to be used by several different working groups in order to come up with innovative solutions to test in practice. Therefore, the process of implementing a commons here is very much shaped by having to co-create it from scratch. That changes the way the nature of the commons is organized.

The inhabitants of the Forest watershed are also organizing themselves to fight against a top-down project that would have an immensely negative impact on the quality of life which the neighborhood brings to its residents. While the commons has had to be created from scratch, the tensions around the watershed have existed for decades. Neighborhoods have long struggled to deal with the floods that have threatened their homes and livelihoods, especially when adverse weather hits the area. On top of that, neighborhood committees have been struggling with governing authorities for decades to come up with flood-control and water-management solutions that favor the neighborhood.

Another unique feature about this case study is the fact that the commons, a strategically located watershed in the southern part of Belgium's capital, is itself a strategic, yet hard-to-access natural resource shaping the geography city of Brussels. The nature of the resource has made a proper governance scheme to deal with recurrent flooding very difficult for the city of Brussels, quite apart from its complex and unyielding administrative structure full of competing layers. To the extent that the city leaders defined the problem as one of inundation management, their solutions have pushed a top-down approach to flood control. Given the current state of inundations and the troublesome solutions proposed by the municipality without proper consultation of local residents in affected areas, this governance scheme has not worked. That is why the EGEB, along with several neighborhood collectives, has proposed to choose instead a bottom-up community-driven governance scheme based on turning the watershed and its water into a commons so as to take charge of shaping the dynamic of water flows. This reconceptualization of how to look at the resource concerned yielded an entirely different approach to the problem, namely the implementation of new urban rivers as a collection of inter-connected constructs directing and absorbing excess water flows. This innovation came from the ambition of the community to deal with the urban flooding problem as a commons, a solution that had not been thought of beforehand.

On top of that, this type of commons is so new and unprecedented that it is hard for authorities to synchronize it into the local regulatory framework of Brussels. Water has been a subject so far only managed by the public authorities. It was always assumed that it was the city's and region's administrative responsibility to deal with water management. Therefore, finances to fix a problem were always devoted to a stream of experts who knew about water, but did not know much about

the local situation. Experts would be hired based on their capacity to halt inundations by whatever means necessary, even if that meant building a huge barrage in the middle of a neighborhood square. Such a top-down regulatory framework has always served as a barrier to create a commons-based approach to water management. EGEB's project therefore struggles to get implemented, because finances go directly to the stream of engineers and experts that work for the municipality, and not to the group of commoners who have proposed an alternative plan of making a watershed a commons. That is also why the project to install new urban rivers has stalled. It should also be mentioned that the municipality hires engineers who work on their own to find solutions. When engineers work alone, they just follow the orders of the municipality to deal with inundations. But if engineers work together with citizens who have built up a considerable amount of their own knowledge of the issue, a commons-based solution, like installing new urban rivers, can become more possible.

Another key difference is the chartering process in the wake of which a document was written to get the municipality's attention and other forms of support. The chartering process emphasizes proposing an idea that has not really been thought of before. Because it represented a new type of commons to be integrated into the public service sector, Bassin Versant Solidaire did not produce such a charter. Instead it came up with a document summarizing and reflecting upon all the practices and choices made to eventually write a charter. What was produced in the end was a "birth certificate", which specifically explained how neighborhood committees and experts gathered together, how they decided upon making a watershed into a commons, and all the tactics they used to obtain knowledge on the matter and eventually create the concept of new urban rivers. It was labelled "actes de naissance," a "birth certificate," to signify the birth of a new type of commons project. The exercise undertaken to produce this document is considered a form of 'chartering'. Rules were decided and created, and the activities to get to a governance framework resembled those you would find in other charters. Those exercises are directly derived from the notion of commoning, and the preparation of a document discussing all these activities can be called chartering. So, while there is no official charter yet, the chartering exercise has been in full fruition since the birth of this idea.

From this experience, we can conclude that a newly created commons facing adverse political challenges in getting support from a municipality used to top-down policies with water management has trouble getting launched in the real world. But some positive lessons can nonetheless be drawn from this experience. More officials in the municipality recognize new urban rivers as a possible solution. They are also beginning to support the notion that citizens can have some level of governance power to decide on how floods should be mitigated. The subject matter has changed since the beginning when the watershed commons project was introduced. The debate has veered towards the commons, and that is where the watershed project has shown success. But without full support of the municipality, it is nearly impossible to put the project into practice. At a certain point in time perhaps the ongoing debates will lead to an implemented solution that favors the work of the communities in managing the watershed as a commons.

Given Brussel's unique conditions, in terms of watersheds, underground rivers flowing through built-up areas with little excess flow capacity, their linkage with the city's sewerage, and public sector biases favoring centralized as well as structure-heavy flood-control "solutions," our case study is genuinely specific to the locality of Forest, in the southern part of the capital city. But the essence of the commons here, serving as a good example of a "transitional urban resource," is a new, decentralized vision of flood control through the construction of "New Urban Rivers." These NURs are each involving relatively small-scale constructs, but then have to be seen in their totality as a radically new way to manage water flows otherwise prone to flooding while also adding ecosystem services based on such management of water facilitating its use in a variety of ways. This very idea, a radical alternative to standard municipal flood control, may be highly relevant in many other urban settings facing recurrent floods of growing intensity, one of the great climate change challenges cities have to confront and deal with all over the world.

5.2.2 Lessons from Agrocité

Agrocité's situation differs from that of Bassin Versant Solidaire de Forest. While that commons itself is also a newly created one, the concept of an urban farm as commons is not new and has been tested already in previous instances. While Agrocité faced a history of adversity in its relations with governing authorities, it has managed to find support from a different municipality.

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When Agrocité first started in Colombes, the nearby residents praised the launch of this project. The municipality initially supported the project's implementation as an experiment. The collective behind the project designed and applied several different commoning tactics to map out a vacant space in the area, occupy that vacant space, and begin construction of an ecologically-geared urban farm that provided resources to the community whose resilience it thereby reinforced. After a couple of years being in Colombes Agrocité's fortunes changed overnight when municipal elections brought a new mayor into office. The newly elected mayor was more oriented towards finding projects that generate revenues for the town's budget. So, the town decided to turn the site where Agrocité was installed into a parking lot charging fees.

The ousting of Agrocité led to major opposition from the community. These embroiled tensions caught the attention of the municipality of Gennevilliers, a neighboring Paris suburb, whose new leaders had recently won the municipal election there on a platform promoting community resiliency and ecological initiatives. They invited Agrocité to install themselves in their city after being ousted in Colombes, and this gave the Agrocité project a second revival. The Agrocité commons and the Gennevilliers municipality supporting it co-exist together. Their positive relationship means that Agrocité has seen a lot more success. The commons is able to flourish and grow without much regulatory restraint, because the state has acted as a facilitator to its existence. Its success has also allowed Agrocité to expand into other locations within the Greater Paris area, like Bagneux and Montreuil. This also implies that the idea of organizing an urban resiliency farm is replicable on its own, even where it lacks its wider institutional context of being part of a broader urban-reorganization project as Gennevilliers' Agrocité has been within the R-Urban project of AAA.

Given the current state of Agrocité and where support from the municipality stands today, we can conclude that this particular urban commons was tested in different settings from the bottom up until it reached a point of success. The charter guiding its progress reflects that process. Even before Agrocité's implementation, a charter had been written to establish a network, find a host of partners to build short circuits in the neighborhood, and come up with a participation and membership policy for those who want to be a part of a commons. The R-Urban Charter, more perhaps than any other tactical charter we analyzed, was a statement of intent at the beginning of

a co-production process for an alternative SSE- and circular-economy infrastructure. As such it represented a road map, built around the two pillars of ecological transition and participatory democracy. It calls for a greater role of participants to perform certain tasks for the collective good of the commons and explains the benefits that arise from participatory exercises, such as retaining shared knowledge, developing new exercises for ecological initiatives, and involvement in meetings for collective decision making. Agrocité's goal is made thus clear by its mother charter's strong emphasis on ecological initiatives, an element that has gained the support of an environmentally focused municipality. While tensions within Agrocité have existed before, its expansion is a sign that the chartering exercise giving rise to its birth has worked.

5.2.3 Lessons from Murs à Pêches

The situation at Murs à Pêches to establish a commons through a chartering process differs from the two previous cases. Murs à Pêches is a commons that has existed for decades, a unique historic site. In the past, it was a much larger common space used by different actors for activities like horticulture. Over the years, as the suburbs of Paris became subject to rapid urbanization, the Murs à Pêches area shrank in size. Even then it continued to serve its residents as a space for recreation and nature. But there was little coordination put in place to fight and keep the space intact until whatever little natural space left was itself threatened to get destroyed. Even today the rapid development of the Parisian suburbs continues to pose a threat to the very existence of the Murs à Pêches. So, the residents have had to come together and reorganize the space collectively as a commons in order to save it from extinction.

By rendering the space re-used as a commons, its users have managed to initiate that political fight for survival in a much more effective manner. Here the production of a commons governance scheme has arisen in order to protect a commons space that has in effect been existing for generations. Therefore, the political fight and the nature of the chartering process are based on a pre-existing commons that also faces adverse opposition from a state likely to be susceptible to pressure from major developers seeing this space as an opportunity for profitable development and thus seeking to acquire that land. The political fight is thus oriented towards preserving a commons

space that is in survival mode for its existence. Of course, the nature of this battle is shaped by the type of commons Murs à Pêches represents when compared to the other two case studies.

A battle for survival means that drastic measures must be taken to keep the space as is. Those drastic measures define the commoning exercises that the Fédération des Murs à Pêches has undertaken to show the value this space provides to its residents. That reasoning led to the decision to host and organize a large cultural festival as a measure to gather support and show how this space is used recreationally. By using the festival, the federation, along with its partners, demonstrated to the municipality that the Murs à Pêches commons provides an enormous amount of cultural value to not only the residents of Montreuil, but all interested Parisians. The now annual festival, which in 2019 attracted 15,000 visitors and 150 associations and firms over a week-end in June, is what allowed the demolition of the Murs à Pêches to be at least delayed. The municipality has no interest in tearing down a space that brings so much cultural activity to its residents at such a low cost.

By hosting the festival, the municipality has even become a supporting partner which helps the federation with logistics and legal processes associated with the festival. This partnership only arose when the federation decided to host the festival, which proves that this commoning exercise was successful. The future of the Murs à Pêches is still uncertain, but hosting a festival in the commons space allowed the federation to delay the demolition of the space. This is an important factor to highlight when describing how commoning exercises may strengthen the protection of the commons. That particular commoning exercise in the form of an annually recurring festival is also a form of communication and a call for support. As more people hear about the festival and attend, there is significantly more support from the public to protect the space as a whole. Gathering petitions to show the support of keeping the space as a commons is another commoning tactic that encourages the preservation of the space.

Because this case study is so much about preserving a commons, differences can also be illustrated in how the charter is written. Instead of having a charter presenting legal tools, the document used as a dialogue initiator with the state is actually an open letter calling on political candidates in the local elections to express their support for the space. Such support should include approval of five

explicitly stated objectives stated in the open letter. The first is to abandon the EIF project, which would render the space a private property, and instead respect that zone for development as a place of co-construction with the member associations of the federation and use the space for cultural, recreational, and ecological purposes. The second is to protect the soil and the non-constructed areas of the commons in order to allow the space to be an ecological hub of biodiversity and carbon sequestration in an area that is otherwise greatly exposed to pollution. The third is for the municipality to recognize the governance schemes tested and used by the federation to co-manage the space as a commons. This criterion puts special emphasis on participative processes giving residents the most control over how the space is managed. The fourth is to have a transparent dialogue between the municipality and the residents and associations about the actual physical conditions of the space, including a commitment to being transparent about how and to what degree the site was polluted. The fifth criterion focuses on having the municipality be a facilitator of the commons, keeping the Murs à Pêches a testing ground for commoning processes which improve the space as a commons and the governance schemes used to govern it.

This open letter informs the municipality of what the residents want from the space, while at the same time calling on the municipality to support this space as a commons. Even though the open letter does not discuss issues pertaining to the legal status of the commons, it still highlights outcomes resulting from a specific set of commoning practices used to preserve the space as a commons. The nature of the open letter is indicative of where the Fédération des Murs à Pêches is in securing the longevity of the commons. Its peculiar format, as an appeal to political candidates in a municipal elections to declare their stance on the commons, means that more commoning can be done to make its preservation more secure. In this process, the objectives, especially as concerns permanent legal status, are still not as advanced as those of Agrocité, a fact demonstrated by the nature of the document used to engage the state.

Section 5.3 Chartering Practices as Acts of Commoning

A couple of conclusions can be drawn when analyzing the differences between the Bassin Versant Solidaire watershed commons, the Agrocité urban-farming and recycling short circuit, and the Murs à Pêches heritage site of ecology and culture. Those differences focus on how far the

commoning process has gone in each case, and how that rate of progress is reflected in the kind of charter created to engage in a dialogue with the municipality. It seems that the more commoning processes have been used and tested within the commons framework, the greater is the likelihood that a charter is designed properly to gather support and allow this commons to exist over the long run. In other words, there is arguably a clear relationship between the kind of charter developed, the chartering process, and commoning tactics used to secure the commons through publication and use of that charter. It has been stated in the commons literature (for example, Linebaugh, 2010 or Ristau, 2011) that commoning is a key process to institutionalize the commons internally and gather support for it from outside actors, above all the local authorities. What our analysis of these three case studies have been able to illustrate is that the chartering process, and the charters themselves, become a solid guide of the various commoning tactics used to create and launch a commons.

5.3.1 Tactical Chartering as Organizing Principle of Urban Commons

We can conceive of this link between tactical charters and commoning processes as a dialectical relationship between the two which hopefully leads eventually to a fruitful synthesis. This dialectical relationship centers around close interpersonal ties between the commoners themselves and their engagement with the municipality to fight for their space. These relationships essentially highlight the interplay and struggles between those two actors who typically have an adversarial relationship. The point about the dialectics is to forge a more constructive relationship around creation and maintenance of an urban commons that serves the surrounding community while also fitting into the policy agenda and political priorities of local government officials. One way to achieve such a productive resolution, as evidenced in our case studies of chapter 4, is through the use of a tactical charter serving as a guide for the commoning activities surrounding the commons, its governance mechanisms, and the (de-facto or de-jure) status of legal protections the municipality is willing to provide. In that sense, tactical charters provide a road map for the urban commons in question. These documents become more important as a crucial step with which to embed the commons properly in the neighborhood, in light of the growing variety of urban commons we can envisage going forward in the struggle of cities against climate change. Our three cases studies, as well as the eight other charters of urban commons we analyzed in chapter 3 (see

section 3.3), demonstrate how these days we are already beginning to experiment with many different types of urban commons, often created from scratch as community-driven alternatives to failed market-based or government-imposed "solutions" which no longer work well enough. But however innovative these new kinds of urban commons may be, their success depends more often than not on their acceptance, if not outright support, by often initially hostile or indifferent government officials.

The growing variety of commons more than ever requires self-definition by means of a charter, both internally for their members, in particular the activist commoners. Inasmuch as a charter is a written document laying out what the commons is, which objectives it aims to achieve, how it is supposed to be governed, who it should be for, and where its members come from, it will inevitably also become a guide for commoning activities associated with creation, maintenance, and preservation of the commons. But a charter serves also the purpose of presenting the commons and its commoners to the outside world, not least of which having to engage the relevant public authorities. Tactical chartering, by which I mean the process of writing and publishing charters (see section 3.3.2), should in that sense be considered a design principle implemented together with the rest of the urban commons principles that we discussed earlier (especially chapter 2). It is a design principle that has been confirmed to be inclusive in the process of urban commons development, as highlighted in detail by our three case studies.

Putting in place a tactical charter must hence be considered a crucially important aspect of commoning, proving often enough to be an indispensable step to make a commons functional. The chartering process also requires commoning to be done. The case studies clearly highlight this fact. In each of these three examples commoning actions gave meaning and content to charters which the commoners used to mobilize the community for the preservation of the commons and gain support from the municipality. There is no charter without commoning. While commoning is essential in the process of the commons creation and function, a point well discussed in the literature of the commons, chartering is a major step in that process, often summarizing how successful the chosen commoning tactics have been. Writing the charter is itself a key step of commoning activity which, while not really stressed enough in the academic literature, has been

clearly established as such in our case studies. We conclude that chartering is another dimension that should be seen as an organizing principle for urban commons.

5.3.2 The Timing of the Chartering Process

It is mostly after having successfully tested various commoning tactics that commoners eventually find it strategically useful to write and publish a charter summarizing their key notions of commoning, how those were implemented, and how they strengthened their individual commons. Such a charter serves as proof of evidence of an organized process of commoning that works in the local context. Charters often provide a comprehensive guide for other commons to learn from. Charters are in that sense a useful tool with which to expand the network of commons while also making the commons more likely to succeed. Replication is a key notion for commons networks, especially since that quality also helps make the commons more robust in their capacity to provide for their communities.

A charter gets constructed, once the commoners have developed certain principles and mechanisms of practice that have worked. In many instances, the collective motivation for a charter arises in connection with having built the collective governance scheme that is now ready to be tested through the validation of the charter. Such a charter would then be validation summarizing what has taken place so far to build that collective governance scheme and what principles will be tested when put into practice. Besides serving note to the municipality of the commons' progress, the charter is also an invitation for other commoners to follow. If that charter is presented in the form of a "birth certificate," as in the case of the Bassin Versant Solidaire in the Forest district of Brussels, it means that the charter production is still in its preliminary phases. Here the charter was conceived as "actes de naissance" for the testing of tactics which, if successful, will move a commons project into a more explicitly ambitious and tangibly concrete phase of its evolution. The actes de naissance declare a set of principles for a collective governance scheme to be tested in practice. And that declaration implies a need to go out there into the field and test those principles in a concrete setting.

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The nature of tactical chartering, how in each instance the charter gets written and distributed, will give strong indication of what type of commons it concerns, more specifically whether a commons is a pre-existing one or a newly created one and also whether it faces a hostile political setting in relation to the municipality or private urban development interests. The backbone of the charter is the social process that involves all commoners carrying out their collective activities. These come together to organize and manage a socially beneficial resource so that they can share it equitably and sustainably. They form themselves as commoners around the idea of a commons project and in concrete acts of commoning. They get in touch with people from the neighborhood and get involved in dialogues with the municipality. They do collective mapping, organize roundtables or assembly meetings, and host events in commoning formats, as the Murs à Pêches federation did when organizing a festival. In such acts of commoning, which gives the collective of actors its group-definition as 'commoners', a commons gets established. In that process, a moment arises almost naturally when the commoners decide to put down the rules of the commons in writing, which eventually transforms into a charter. The charter then becomes a validation where its authors declare those commoning practices not only in the governance scheme around which the commons was built in the first place, but also in practice and on the field. That process allows the charter to be used as a jurisdictional tool to get support from the municipality. At that point commoners tell the municipality that rules, norms, and actual provisioning of resources have been put in place, and that those should now be officialized after having been validated as operational through the testing which took place during the creation or establishment of a commons.

The longevity of commons, consistently one of this institution's greatest challenges to master, normally requires that at some point operational rules, cohesive norms, and effective provisioning of resources get shown to have actually worked in the field so that they now can become officially approved and legalized in order for the commons to have a life afterwards. Any such charter of an urban commons then serves as a declaration of those developed principles that were tested and confirmed to work in practice within the framework of cities. The process of chartering allows the commons to be institutionalized.

Iaione (2014) states that commoning happens in four phases. Those four phases are the mapping, the prototyping, experimenting, and the implementation of the commons. It is through these four

phases that a commons anchors itself into a lasting, durable institutional framework. If the commons is new and just entering a form of establishment, then a charter might take the commons from the prototyping phase to the experimental phase of the commoning process. Various commoning practices are formed first through micro-tests conducted in the prototyping phase or experimental phase. This is usually detailed in the charter as a statement claiming that commoners have already built an all-round prototype of the commons and its rules, and that those rules are now ready to be tried out in the field. A charter can also take the commons from the experimental phase to the implementation phase, with the charter in that case claiming that because of successful tests of experimental practices having given rise to a functional governance mechanism, the commons is now ready to be implemented into the regulatory framework of cities for which it should be accorded a legal status. We have already seen in our case studies that governments have begun to define appropriate legal status provisions for associative and cooperative structures built organizationally around urban commons, such as Italy's new constitutional concept of 'horizontal subsidiarity' or France's Établissement Public de Coopération Culturelle (EPCC) or de Coopération Environnementale (EPCE).

There may be different stages at which the charter arises to drive the commons forward. Our case studies illustrated tactical chartering processes at different stages in the life cycle of the urban commons concerned, along with different circumstances. In the example from the Bassin Versant Solidaire de Forest, the charter took the form of an acte de naissance. The "birth" implied here is having its most active commoners grouped around the États Généraux de l'Eau à Bruxelles (EGEB) take that commons from the prototyping phase into the experimental phase where they would test the rules implemented to build new urban rivers. It is those NURs which crystallize the watershed into a community-managed commons. With Agrocité, by contrast, the chartering process moves the commons project from experimentation to implementation according to the phases defined by Iaione (2014). The success of that move fosters the spread of Agrocité into Bagneux and possibly even Montreuil. As concerns the Murs à Pêches, the commoning process stems from the fact that the space has existed for a long time in pre-urban settings until it was existentially threatened by the prospect of commercial urban development. After it had been greatly shrunk, the space had to be redefined, then repurposed as a commons to survive. Even then its existence has continued to be threatened by various designs and plans of private developers

keen on getting their hands on this strategically located space. The various commoning tactics of the Fédération des Murs à Pêches, the umbrella organization bringing together a large variety of activist entities with a stake in the commons, have all aimed at protecting the site from further commercial development. The federation's open letter to candidates in the course of a municipal election campaign soliciting commitments of support, a unique type of charter, is part of a concerted effort by the commoners to get local government support for the long-term survival of the commons which has produced tangible results.

5.3.3 The Dialectics of Tactical Chartering

The chartering process plays out in dialectical fashion on several levels. The term 'dialectics' implies a thesis and an antithesis facing each other in a state of tension reflecting conflicting interests, yet possibly also working through their antagonisms to fuse tensions into a synthesis of cooperation. Such dialectics play out on several levels when it comes to the chartering process. There is the tension among the commoners, especially as they try to build a network of activists around management of the commons. The chartering process defines their common purpose focused on the resource managed as a commons. And the commoners will give themselves such a collective definition by having the charter clarify the collective-action steps of commoning which have worked for them as a commons-defined group of commoners. A second layer of dialectical tension addressed by tactical chartering extends to the surrounding community. Here tactical chartering is a process of outreach and inclusion for a productive long-term coexistence where local residents use the commons and appreciate the varied ecosystem services it provides them for a better quality of life. And finally, as already mentioned, there is the relation with the municipality for validation of the commons into a regulatory framework. When a commons enters the regulatory framework, that relationship can be described as the synthesis, especially when the charter is published.

On each level, the dialectic works here in the sense of a thesis and antithesis, poles in antagonistic relation to each other, but also interdependent, interactive, and affecting each other in a creative tension. What is "tactical" here is the use of the chartering process by active commoners as a crucially important act of commoning towards forming a group ready for collective action,

embedding the urban commons in its neighborhood with the support of local residents dedicated to its continued presence, and getting the legal protection, and perhaps even financial support, from eligible representatives of the state.

To conclude, Iaione (2015) redefined how urban commons fit into a regulatory framework of cities by implementing acts of commoning to generate and preserve much needed community-based resources which neither market forces nor state authority can provide anywhere near as well. This theoretical approach continues to evolve as commons are more and more studied in urban economies. My own principal contribution in this thesis has been to highlight the chartering practices as a vital part of commoning and a crucial transformative force in the maturing of the commons. I have also wished to demonstrate how chartering might push the inherently dialectical relationship between the commons and the municipality to a fruitful synthesis facilitating the former's long-term survival. Finally, I have tried to make a case that the governance schemes of urban commons may make them effective actors in the cities' upcoming existential battles to adapt their urban agglomeration to the impact of climate change, with such urban commons usefully providing "transitional urban resources" we will need going forward. Tactical chartering should therefore be declared as a new theoretical principle for urban commons. Its dialectical dynamic is directly in sync with the commoning practices that Fournier (2013) has claimed to be the backbone of commons creation and development.

Section 5.4 Challenges

While there is strong indication that the commons have become increasingly important players in cities, especially when faced with the reality of climate change, there are still several challenges and limitations they face in their quest for relevance and success. The first challenge is that urban commons are particularly dependent on the state and how the state is run. The nature of the commons as a shared resource makes them dependent on exogenous actors for support, especially when it comes to the state acting as a facilitator for the commons. As observed in the case studies of chapter 4, conflicts may easily arise between the municipality and the commoners as to how the space will function within the regulatory framework of a municipal zone and how the state should cooperate with the commons' ambitions. For example, Agrocité's post-election rupture with the

municipality of Colombes following a change in the mayor's office in favor of revenue generation and commercial motives rapidly turned a commons into a parking lot. Here the municipality turned from facilitator into an adversary of the commons. Many urban commons have not yet been able to reach a pivotal point of independence, and unfortunately, their existence continues to be in the hands of the municipality's governing body. Commons have a long way to go before they can claim independency or be powerful or important enough to be immune from electoral changes, and that is one of the major challenges commons face today.

5.4.1 The Challenge of Local Government Support

Even when commons have set themselves up successfully to function well on their own, they still depend on effective local government for support in a number of ways. If a municipality suffers from regulatory slippage, for example, it means that it cannot cover the costs of maintenance for certain spaces in cities. The commons may succeed in replacing that role and contributing to the maintenance of a shared space. If and when that happens, the municipality might pass on the responsibility informally to the commons, even though it still remains the principal land owner. This sort of informal collaboration may also stir conflicts between the two groups, especially if the commoners do not receive a certain level of recognition from the municipality in taking on this kind of responsibility. While the shared space may be maintained this way, the informal nature of collaboration between the municipality and the commons may lead to inadequate outcomes weighing on the commons' ability to provide for its neighborhood.

These sorts of informal arrangements can have a particularly strong impact on how a commons is managed in a brownfield site. In many cases, commons resurrect in spaces that have suffered serious neglect and urban decay. Some of these sites might be hazardous because of pollutants, contaminants or other dangerous substances, rendering them potentially dangerous to the sites' users. But the challenge of what to do with these spaces remains unclear, especially since different actors have divergent interests in terms of how best to render the space usable. Large-scale development will favor cleaning out the pollution and developing the space for profit-making structures, such as housing or commercial spaces. Commoners will favor a cleaned-out space to be turned into a shared space. The municipality often favors large-scale development, because

such a space will provide revenues in compensation for the typically considerable clean-up costs. And they may also be uncertain how well a commons can really take care of problems with that space. In case the brownfield land remains untreated, continued safety concerns might well block any actors from developing the area, which has a direct impact on how municipalities view commons development in their area. This kind of clash of priorities over how to develop brownfield sites is clearly evident in the case of Murs à Pêches, where commoners struggle to make the space usable given its history of pollution. The space remains a commons, but several questions remain as to how the municipality will treat those portions of the space deeply affected by industrial pollution. Some of the proposals laid out do not satisfy the commoners of the Murs à Pêches federation, and these disagreements have fed conflict between the two parties who have for a while now also tried to collaborate on managing the space to the benefit of nearby residents.

The municipality also has a role in providing external recognition for the governance and monitoring rules which commons create collaboratively to achieve some level of success and permanency. But such a role by the state is very hard to assure when the government is subject to conflicts of interests with the commoners themselves. Obtaining that external recognition is complicated, if the government has a different vision on how to use or occupy the space. Nevertheless, if the commons provides a lot of positive externalities to the neighborhood and succeeds in its mission to improve the quality of life of local residents, the state may be more inclined to provide that external recognition and provide support that the commons need to survive in the given spaces. It helps when the collectively established rules do not conflict with the state's initiatives and ambitions. During the introductory phases of a commons, one of the first steps is to establish collective-management rules for sharing, monitoring, and sanctioning of the resource. These rules, which Ostrom (1990) claims are based on the provisioning and allocation of the resources, are what makes a successful governance scheme possible. But often enough, such internally recognized rules are not enough inasmuch as they also require external recognition by partners, actors, and governing bodies. The commoners, who remain the main appropriators of these crucial rules, can only effectively enforce them, if others accept these rules as well and work with the commoners to recognize them.

Often enough urban commons find it difficult to get long-term support of municipal government because of the dominant influence of commercial interests in urban development. A property in a city is considered to be quite lucrative, especially when located in highly frequented areas. At the same time, such a property may be a potential place for occupation and creation of commons. But such a process may be deeply threatened by municipalities favoring lucrative businesses to take over the space. And because commercial interests are often picked over commons initiatives, the commons' ability to scale up and have a social or ecological impact in a city is often thwarted. A clear example of this is Murs à Pêches, where the municipality is trying to expand development within the heritage site itself. This has created tension between the associations representing the site and the municipality trying to expand the built-up neighborhood. Those kinds of tensions are ubiquitous, and one of the major reasons why commons have a smaller impact today. It is a tension that commons will have to face until municipalities change their priorities and move away from profit-driven motives. That being said, commons can focus on occupying spaces that may not be considered profitable properties, notably in brownfield sites or in areas of rapid urban decay and degradation. Agrocité has managed to occupy a space around public housing that was not considered a development zone. This location has allowed them to keep their space and produce common pool resources in the public areas of the public housing units. But this tension will continue to be a prevalent situation, especially as municipalities seek to gain sources of income by selling properties to business-oriented organizations.

While these challenges remain, several commons have already made major progress in establishing relationships with municipalities as a call for support, particularly by engaging the municipality in continuous dialogue. The case studies show that by implementing charters and getting in direct contact with council members, both the federation of Murs à Pêches and Agrocité's R-Urban network have succeeded with their outreach efforts to muster external support for their engagements. Agrocité's success in Gennevilliers has been helped by direct support from the local authorities governing that Parisian suburb, and the growing support is evidenced by the new Agrocité sites springing up in places like Bagneux and Montreuil. For Murs à Pêches, the future remains uncertain. But its federation's ability to maintain a festival for several years already indicates a certain level of support from the municipality. And such support may get even stronger in making the Murs à Pêches a permanent commons in the area, even if there is a challenge by

private developers wanting to occupy that space. For Bassin Versant Solidaire de Forest, one of the aspects hindering the project is a lack of clarity between the commoners and the municipality of Brussels. This therefore is a case study which shows that commons will struggle without the state being a proper facilitator.

5.4.2 The Challenges of Internal Cohesion, Networking, and Scale

Peter Parker and Magnus Johansson (2011) discuss two different kinds of challenges commons face when attempting to get their rules recognized, supported, and enforced by governing bodies. The first challenge focuses on traditional commons. It involves the recognition of rights by users and involved actors to put these rules into place for the sustainability of a shared resource. The second challenge focuses on contested commons, which is a term that defines urban commons most effectively. It involves appropriating these rules of provisioning in spaces where different actors may have different views on how the resource should be managed. The tensions arising from these differences between various actors in collectively managing these contested shared resources make it harder for governing bodies to recognize operating rules formally. There needs to be a certain level of coherence concerning these rules, and tensions may render such coherence impossible to achieve. That kind of challenge is evident when the municipality of Montreuil struggles to give appropriate recognition to rules when so many members of the federation have different views with regard to how the Murs à Pêches should best be used.

Such propensity for internal conflict happens more in a contested shared resource which is often the case in urban commons. As mentioned by Iaione (2015), urban commons often attract users with very different social backgrounds, who may have different objectives for their involvement in the governance. Such difference can create tensions among the users, which makes the governance much more difficult to achieve. Often enough, these different visions can inflict social tensions which prevent proper development of commons management. It also may deter people from joining the commons, because these conflicts may appear unresolvable and as such ultimately damaging to their own interests. The Murs à Pêches is a clear example of this. There are tensions between some associations that represent the ecological aspects of the space, and the associations that are in charge of the social aspects of the space. Since the associations have different interests,

several disputes have arisen over what rules to decide upon. And those at times degraded the integrity of the governance, making it really difficult to move forward. In addition, such conflicts could also be seen as a challenge for the quality of the commons and the conditions it faces. Some conditions, as apply for example to commons in brownfield sites, create issues when determining optimal use and design during the planning phase of the commons. Such conditions can lead to the uncertainty of how the commons will be managed. This uncertainty renders collective decision-making more complex, which could impede on a governance scheme that works for all commoners.

Yet another challenge endangering the effective functioning of a commons arises from its often excessive isolation. Commons struggle without a network that links them and empowers them together. In Lain (2015), the author specifically emphasizes the need for commons to create networks of mutual support and knowledge sharing when it comes to managing common pool resources on a broad and fully democratized scale. In order to achieve success, commons have to develop networks that allow commoners to share experiences, learn from them, and incorporate methods of commoning possibly coming from other similar commons in a shared network. An example of how commons networks are forged can be found in how the city of Bologna fosters collaboration and regulation of commons, or the Procomuns initiative in Barcelona. These commons have seen some success in engaging public authorities to support them, not least because they were part of a broader network of managing commons for the people. As mentioned in Lain (2015), commons organize themselves in federations of communities and experiences. When analyzing most of the relevant urban commons of today, they are often linked to a network that makes them stronger and more effective in providing shared common resources to lower tiers of the population. These networks of commons can be seen as the development of an interconnected system where commons can feed, learn, and share with each other. Lain (2015) mentions that without such an intermodal system, the commons initiatives will remain weak on the macro or meso scale. Therefore, a challenge that urban commons must overcome is expanding these networks beyond the scope of the neighborhood. This will allow them to gain more support from relevant actors as well.

A key point to make when analyzing this specific challenge is that commons must achieve a scaling-up capacity that allows them to impact society and markets in greater ways. As commons stand today, they may have little impact on changing the way governments and markets function. In order for them to achieve such an impact, they must be a much bigger group of organizations capable of scaling up to work with or compete against states and markets. This requires networks to expand beyond the city or neighborhood limits they find themselves in today. But that challenge is certainly being addressed by commons we see today. Murs à Pêches is trying to expand its federation beyond the associations that use and co-manage the space properly, precisely to win the legal battles it faces against a municipality preferring developers to build over the space. With Agrocité, we are also seeing the R-Urban actors work with cooperatives and associations to make its network, as well as the urban commons within the network, more resilient. AAA's R-Urban network, of which Agrocité is strategic part, has been largely successful in attracting many partners by creating a local economy that prioritizes the well-being of local residents. These examples illustrate the potential of scaling up the commons to have a bigger impact on promoting climate resilience in cities.

Such initiatives of scaling up the commons through intermodal networks are already taking place, as indicated with this or that example in my thesis. A good example is the *Remix the Commons* network as an online platform analyzing various commons and linking them with each other through related themes and initiatives. This helps each commons locate other potential partners with whom the sharing of experiences and lessons can strengthen each of their causes. Such strengthening accelerates to the extent that there is more similar information available within a network. *Remix the Commons* is also trying to respond to this challenge of fragmented commons through network building and platform development supporting the creation of these vital networks. We have already made a case earlier (in section 3.2.1) for the potential of peer-produced open-source platforms to help urban commons scale up.

Section 5.5 The Future of the Commons and Rethinking the Challenges

Before coming up with recommendations to address the challenges discussed in the previous section, we should give a brief summary of what is at stake for commons in the future. To begin

with, urban commons are not yet sufficiently present in the world even though they may be seen as having enormous potential in contributing to the rethinking of cities amidst climate change and pushing socio-economic activity beyond the capitalist logic of private property and profit, as encapsulated in my notion of urban commons as "transitional urban resources" introduced in section 3.4.2. Their lack of prevalence is due to the fact that we still rely on a system prioritizing individual choice, the profit logic, and private property. Cities need to come up with ways to encourage implementation of urban commons so that they are more prevalent rather than scarce and scattered. Moreover, urban commons are fragile and have a hard time assuring their longevity, primarily because of exogenous factors like adverse election results or private development. They are hence not yet capable of putting a major stamp on urban planning. This then begs the question how they can maintain the enthusiasm of sufficiently large numbers of commoners over time. To meet both of these challenges and to have urban commons function as a climate change resiliency tool over the long haul, urban commons must be scaled up.

5.5.1 Transitional Urban Resources as Vectors of Change

The scaling up of urban commons can take place on several levels simultaneously. This begins with advancing the theoretical framework of commons and commoning, by broadening the definition of what constitutes a common-pool resource. To put this in proper context, the definition of CPRs should also include new ones created from scratch, to which commons can be applied, a point we already stressed at the beginning of chapter 2 (in section 2.1.1). Such newly created resources might be either social processes which evolve during acts of commoning, or circular-economy projects involving use and reuse of existing resources, or projects of environmental protection and conservation such as the greening of roofs, planting of trees, and implementation of carbon sinks. Such a broadening of the CPR definition in the direction of what I introduced at the end of chapter 3 as transitional urban resources (section 3.4.2) will allow commons to have greater flexibility in terms of how they can be applied to new forms of urban planning that will become more prevalent in the 21st century.

As most countries are trying to transition to a carbon-neutral economy, urban commons can and should build CPRs from scratch that are designed to implement much needed ecological features

in cities, promote a policy agenda aimed at reducing greenhouse gas emissions to a net-zero level, and help communities achieve climate change resiliency. Such transitional urban resources organized as commons may contribute to the construction of the circular economy (e.g. compost and its regenerative uses), creation of carbon sinks (e.g. planting of trees in cities), and implementation of measures of sustainability. Such new forms of CPRs taking the form of TURs can synchronize with major policies introduced to combat climate change, notably the seventeen Sustainable Development Goals (SDGs) of the United Nations "2030 Agenda for Sustainable Development" (https://sdgs.un.org/goals).

If we re-frame commons in such a manner, we must consider all kinds of TURs in the context of the "circular economy," especially now that the European Union has committed resources to its promotion (https://ec.europa.eu/environment/strategy/circular-economy-action-plan_en). Our case studies of chapter 4 have already made that point. Take, for example, the Bassin Versant Solidaire de Forest (section 4.1). Its commoners attempt to turn a watershed, a source of recurrent flooding threatening the neighborhood and hence a resource until now considered ungovernable, into a TUR endowed with a governance scheme whereby it gets turned into a commons. The called-for broadening of the resource definition in this case involves rethinking water and its flow dynamic. Rather than thinking of the watershed as a liability or threat, the commons transforms the resource into a tool for flood control, with the help of innovative water-flow control and -collection constructs known as "New Urban Rivers." Or look at Agrocité (see section 4.2). Both its own initiatives as well as its partnerships are grounded in the promotion of the circular economy, as when constructing rainwater catch systems, reusing waste materials, developing recycling programs, and promoting use of composting. Agrocité's urban commons is forged by making these circular systems the very TUR for which its activists have built a collective governance mechanism. When it comes to our final case study, the Murs à Pêches (see section 4.3), it is by now the festival which has come to dominate the governance of this heritage site to the point where we can apply the broadened CPR concept to such an annual cultural get-together event as the best defense against destruction of whatever is left of this historic site.

It is quite possible that followers of traditional common-pool resource theory (N. Steins, V. Edwards, N. Röling 2000; E. Schlager 2002; F. Saunders 2014) would not approve of such radical

redefinitions of the concept in the direction of TURs to make it that much more applicable in support of boosting the scale of commons. But we live in a transformative moment where we face an existential threat from climate change to which we will have to respond in comparable measure by changing radically how we produce and consume, how we live and use our resources. That urgent challenge requires us, among other things, to rethink resources and how we manage them. The fight against climate change demands many new resources or different management of existing resources, and this is where the broadening scope of how we come to think of CPRs and what we need to include in that concept has to be applied. All three of my case studies have illustrated precisely that point, in each instance analyzing more broadly defined common-pool resources being turned into transitional urban resources best organized as urban commons.

5.5.2 Alliances, Sources of Funding, and Tactical Charters

Another driver of the necessary scaling up of commons should be commons-cooperative alliances whose collaboration and organizational integration could improve the chances for either to have success. As already indicated in my case studies of chapter 4, commons can often usefully complement other organizational structures of SSE, especially cooperatives. Such a synergy can create more than the sum of its parts, something that the Co-Bologna cooperation agreement between the city of Bologna and the Fondazione del Monte di Bologna e Ravenna deliberately indicated in their logo called 2 + 2 = 5. As shown in my sections about a commons-cooperative alliance (see sections 2.6.2 and 3.4.1.2), these synergies can both work ways. They can facilitate funding possibilities for commons while providing cooperatives with the management of a CPR as a collective interest.

The key aspect to point out here is how such synergies can strengthen the durability of the commons. This was visible in Agrocité, when the commoners paired with the Recylab cooperative to build a circular economy around recycling. This integration between cooperatives and commons seems especially promising in the urban context and for newly created commons, such as turning abandoned buildings into cultural centers. More generally, when pushing for "sustainable capitalism" there needs to be more focus on public goods, or common goods, and less on private property. There needs to be also more focus on social benefits in lieu of private profits. These

reorientations will also nourish a greater push towards SSE. In this context, it is important to make commons as much of an active part of that SSE alternative as possible. In the context of climate change, and the needed transition towards zero-carbon economy which the whole world is about to embark upon, there will also be a push into the "circular economy."

One key aspect here are the still barely recognized "Scope 3 emissions" which, if companies want to make good on their goals for carbon neutrality by, say, 2050, will force everybody to become much more conscious of the life cycle of products and how they relate to each other and to people. Under such circumstances, urban commons can help cities reduce their emissions to the required level by implementing circular economies, carbon sinks, and new collective practices that encourage citizens to be environmentally conscious. Commons can presumably also play a big role here, in the circular economy, especially when integrated with other facets of SSE such as cooperatives. We have already mentioned examples linking commons and cooperatives for certain objectives like community-based solar panel installation programs or recycling programs designed to extend the life cycle of certain raw materials or objects. This kind of integration can help cities achieve their policy goals by engaging communities to undertake self-generated ecological projects. The commons should be a central component of such initiatives, especially once they will have proven their ability to help such environmentally focused endeavors succeed. Such legitimation of commons can be greatly facilitated by pairing them with cooperatives in various environmentally oriented projects, as that will increase financial stability and support for the commons to make them more likely viable in the long run.

This brings me to my next point which is that commons need to come up with reliable funding streams to help them finance key projects. Such funding can be secured from foundations and the government, as those entities seek to finance projects that are ecologically promising for the future. While commons can do their own forms of crowd-funding to finance collective projects, that may not be enough for long-term plans. In order to receive funds from elsewhere, commons must be part of a more broadly defined socio-economic infrastructure for projects investing and engaging communities in activities of sustainability. Commons can then be incorporated into programs like the European Union's LIFE Program (https://cinea.ec.europa.eu/life_en), which supports climate change mitigation, facilitating projects dealing with sustainable farming, land use, peatland

management, renewable energies and energy efficiency, while improving the quality of the environment and creating a climate-resilient economy through pursuit of circular-economy projects. Commons must be considered in these investments, potentially creating a win-win situation for commons getting funds of this caliber and for the EU seeking to be effective in launching useful projects.

An even more ambitious investment plan under the auspices of the European Union is the €750 billion "Next Generation EU" recovery fund (https://ec.europa.eu/info/strategy/recovery-plan-europe_en), which is the largest stimulus package introduced by the EU ever and provides long-term streams of funds to address uncertainties and unforeseen needs when trying to build a greener and more resilient economy. The commons can play a role in addressing these needs, as their main goal is to forge more resilient communities for the fight against climate change. The United States has its own plans to fund similar projects, like for example Biden's "Build Back Better" Program which has the same ambitions as the Next Generation EU recovery fund. In order to strengthen such a policy, the commons should definitely be included into the agenda of these two large-scale public investment plans. Once passed, New York's Climate and Community Investment Act (https://www.nyrenews.org/ccia) would be very conducive to the launch of urban commons fitting well into the CCIA's policy framework. More generally, public funds on infrastructure, especially zero-carbon transition infrastructure, could be extended explicitly to SSE and circular-economy projects, in conjunction or collaboration with the development of urban commons. This will also provide a major opportunity for commons to be scaled up adequately.

The scaling-up of commons also reiterates the importance of collectively elaborated and well-structured charters, as we have argued in more detail in chapter 3 (in sections 3.3.1 and 3.3.3). These charters are key representations of how each commons' governance is formed and supervised. They are proof of a functional governance system that partners and authoritative bodies should respect. These charters can be a key jurisdictional tool for scaling up, especially to indicate to partners that effective governance has been established. It is what sets the rules and norms in motion. Specific requests for certain needs by governments can also be addressed in these documents, as shown in the case of the Murs à Pêches where its commoners asked the municipality of Montreuil to preserve the site for a festival that is beneficial to the whole neighborhood. That

site would then be protected for other forms of commoning, allowing a key carbon sink to be restored. The charters should be widely circulated as a means of propagation for the commons and also to learn from each other.

We can use the case studies as examples of how charters become a key criterion in achieving a governance used for the long haul. Charters must be a part of the foundation of commons that are getting scaled up. And their circulation will allow for a broader movement where links can be made and commons can partner up with each other. This would only accelerate the scaling-up process in this context. Thus, the notion of charters should be greatly expanded in the theory of the commons, given their capacity to attract partners and convince municipalities of the commons' importance in certain urban areas. They need to be an integral part of commoning in order to make those commons a long-term solution to fighting climate change.

Section 5.6 Concluding the Chapter

Chapter 5, being the last chapter of this thesis, terminates the discussion of urban commons as climate change adaptation tools in both a political and economic perspective. By highlighting the key findings of the analysis in the three case studies through a transversal discussion, the chapter reviews and sums up all the key notions of urban commons here. We conclude here that the methodological tools introduced in the thesis work for urban commons analysis. Chapter 5 serves as a perfect final chapter to move towards the conclusion of this thesis, which will be presented right after this chapter. This last chapter also marks the end of the second part of my thesis. From here, we move on to the overall conclusion of this thesis, highlighted in the next upcoming section down below.

Part 2: Conclusion

Part 2 of my thesis, comprising chapters 3, 4, and 5, pursues several lines of investigation to highlight unique specificities, organizational potential, as well as diversity in context and usage of urban commons already clearly evident in this relatively early stage of their life cycle. We are just beginning to see urban commons make their presence felt in different settings to make this a good moment for some considerations building a theoretical foundation for them.

In Chapter 3 we point first to a long line of scholar-activists, starting with first female Nobel Prize winner in Economics Elinor Ostrom herself, having studied commons. Of particular relevance in this context is Sheila Foster's and Christian Iaione's path-breaking work on urban commons in their Co-Cities Project. Placing my own work in that tradition, I too had a chance to use an online platform, the *Remix The Commons* (www.remixthecommons.org), for the purpose of urban commons research. Such platforms can facilitate the data collection and commoner networking processes driving the spread of urban commons. Recognizing that these online platforms can be best organized as a distinct sort of urban commons themselves, we propose here such peer-produced open source urban commons (PPOSUCs) as an important methodological tool in the propagation of the commons movement among urban residents. I only regret not having had a chance to compare different PPOSUCs introduced in this thesis more closely. The usefulness of PPOSUCs in that endeavor can be illustrated by my own research at *Remix* collecting and documenting more than two dozen charters which commoners of different urban commons across France and other EU countries have written to document their mission, specify the governing principles guiding their commons, mobilize partnerships and/or establish productive relations with local authorities able to help secure the long-term survival of their commons. It is precisely for this reason, as a quintessential step in giving urban commons their defining character, that we can consider such charters as "tactical." At the same time the process of coming up with such charters is itself a crucial act of commoning, something we can usefully characterize as "chartering practices."

To shed more light on the latter, I have taken a closer look in chapter 3 at eleven of those charters, subjecting them to discourse analysis in order to distill the different kinds of commoning activities

they focus on – getting the community involved, setting up the commons as physical and social spaces, spurring collective action among stakeholders by democratic means of collective decision-making, and achieving permanency for the commons project in question. This work, besides allowing us to identify common ground among otherwise diverse urban commons projects in terms of distinct and widely shared "chartering practices" which I have summarized in a Tactical Chartering Manifesto (see Appendix), prepares the ground for a closer in-depth look at specific urban commons and how they create transitional urban resources (TURs) inclined to protect their neighborhoods better against environmental degradation.

The three case studies presented in chapter 4 - the Brussels-based urban watershed commons Bassin Versant Solidaire de Forest providing an innovative community-based approach to flood control, the urban farm Agrocité as part of a bigger social solidarity economy project known as R-Urban on the western outskirts of Paris, the historic legacy and cultural site Murs à Pêches in the Eastern Parisian suburb of Montreuil – all all examples of urban commons using charters and aiming at increasing the resilience of the neighborhoods in which they are located in. They also illustrate the importance of commoning activities, including chartering processes, in giving urban commons life and sustenance.

The transversal discussion of the case studies in the concluding chapter 5 points out their similarities and, in so doing, makes a strong case for urban commons as providers of transitional urban resources usefully applied in the cities' fight against climate change. Identifying in that chapter also the specificities marking each of the case studies highlights at the same time the amazing diversity of urban commons even at this (relatively early) stage of their development.

Conclusion: Wrapping up the Notion of Urban Commons as a Tool for Climate Change Mitigation and Adaption

Concluding this thesis, I wish to highlight some of my key contributions and findings. There are also some regrets I wish to voice about not having the time and/or resources to explore the PPOSUCs, especially in terms of how they compare to each other, and not following up further with the leaders of the three projects I chose for extensive case studies. Finally, the key findings of my thesis open further questions for additional research.

6.1. Key Contributions and Findings

Summing up all of the theoretical findings of this thesis, we can state that urban commons show a clear path of how cities can be better prepared in adapting to the climate change crisis. We also show how urban commons can become climate change policy tools in cities. Such policies mentioned throughout the thesis give space for urban commons to thrive. The case studies used to prove this point are essential to confirming this claim. Each case study responds to a localized crisis in their very own way, whether it is for finding community-based solutions to a watershed that floods heavily populated areas, whether it creates opportunities for circular economies where they didn't previous exist before, and whether it is preserving an important heritage site that contributes to the well-being of the community around it. In this last section of the thesis, I will aggregate all the key contributions that this thesis provides to the overall literature on urban commons and highlight the importance of these contributions in advancing the notion of urban commons both in theory and in practice.

The first contribution is a general one, and it has to do with how urban commons are appropriate tools for urban communities to become ecologically resilient to the effects of climate change. This thesis discusses several features that make urban commons the fitting tool for cities wishing to advance the ecological transition towards a zero-carbon economy. Various features of urban commons are highlighted and distinguished in the typology of urban commons I provided in section 2.4. These features can be considered as ecological resiliency tools. One such feature involves the production of ecosystem services in the middle of densely populated urban areas

subject to a lack of biodiversity and concentrated pollution. This allows highly urbanized settings to have a series of useful ecosystem services, such as carbon sequesters, to be placed right in the middle of areas where those services can be quite effective but would otherwise rarely exist on their own. Other examples of such ecosystem services are the production of food in areas where they are consumed, which we have seen in section 4.2 with the urban farming project Agrocité, or the use of water as a byproduct of irrigation instead of being a problem of inundation, which we have seen in section 4.1 with Bassin Versant Solidaire de Forest.

I have also tried to demonstrate how urban commons can produce new resources, which we can characterize as "transitional urban resources," such as circular economies or short-circuits, inasmuch as they are established precisely for communities to advance the ecological transition. Such TURs make urban commons inherent tools of ecological resilience. Adopting a broader definition of urban resources as "transitional" can help us anchor the idea of urban commons as vectors of the ecological transition while at the same time advancing a new way of understanding capitalism based on resource reusability and abundance. Such resources may not be immediately visible, because they consist of systems and processes that help recycling as a way of reducing emissions arising from production and distribution. We consider his argument as vital in demonstrating how urban commons can become inherently ecological, all while advancing the key goals of climate-based policy in cities.

The second contribution concerns the Peer-Produced Open Source Urban Commons (PPOSUCs) discussed primarily in Chapter 3. There we introduce PPOSUCs as a type of online information and communication platform, itself organized as a knowledge commons. These PPOSUC platforms trace the evolution of urban commons on the ground from a variety of angles while at the same time exploring the specificities and distinct local contexts of the commons projects they cover. These PPOSUCs help drive the commons movement forward, not least by putting commoners from around the world in touch with each other to learn lessons from each other's experiences. But they also serve as major databases and hubs of information in analyzing commons, which is exactly what was done in this thesis. Using PPOSUCs in such fashion can help researchers like me develop theoretical foundations of commons based on case studies that exist

and are thoroughly documented in these platforms. PPOSUCs thus have considerable potential to drive the theory of the commons forward as well.

The <u>third contribution</u> of my thesis I would like to highlight concerns alliances between commons and cooperatives. This is not a new idea, and there has been plenty theoretical discussion before this thesis about such commons-cooperative alliances. Nor is the thesis the first literature review on this topic. What the thesis does help clarify is the potential for synergy between these two institutional forms which, when put together, creates an active, locally grounded structure greater than the sum of its parts. Commons can help direct cooperatives more creatively towards proper actions benefitting communities. And cooperatives, on the other hand, can offer an organizational and financial framework for commons to survive. By analyzing key examples of such commons-coop alliance not previously mentioned in the academic literature, such as Omnicommons, Enercoop PACA, and Procommuns Barcelona, the thesis makes a case for this kind of alliance becoming a key pillar in the social and solidarity economy. The examples discussed here show commons provide opportunity for building funding schemes or economic models adapted to several different urban contexts today.

The <u>fourth contribution</u> is attaching the notion of chartering practices as a key part of commoning. The chartering practices that were observed in this thesis were derived from analyzing charters of commons both in a general degree and a degree specific to nurturing practices for the ecological transition. Charters provide a handful of information to the public, notably objectives and activities done to secure commons or position them as a viable institution within the regulatory and economic frameworks of neighborhoods. While charters are often seen as brochures of communication, they also help commoners engage in dialogue with municipalities to show how their collective governance is structured while seeking a stamp of approval and support by legal and public bodies. In this thesis, we see that many charters have been effective in achieving this crucial goal of validation. With that said, they are also interpreted as jurisdictional documents that can be used to validate the space as a commons within a regulatory set up. As a result, charters become key methodological tools to analyze how urban commons relate and interact with the neighborhood on a social and legal level. This thesis highlights charters in such an academic

setting, which is a major contribution to how we can study urban commons their various commoning processes in a much more analytical level than before.

The <u>fifth and final contribution</u> is advancing the theory of commoning as a key aspect in building urban commons and their collective governance schemes. The literature on commoning has showed immense progress, especially when Iaione (2015) presented the different phases of commoning as a social process to create commons. But this notion can go further. This theory becomes more robust if we categorize these 'phases' as building blocks, with no particular order on how these commoning activities should be conducted. These building blocks of commoning would make urban commons development a long-term implementation in urban regulation rather than just something that is set up and being short-term. Therefore, this thesis highlights added building blocks that lead to urban commons' longevity, introducing a chartering, partnering, and replication, all of which correspond to commoning actions that may or may not take place after a setup of commons. By presenting these building blocks together, we see how commoning goes a step further in securing commons as long-term solutions to climate change in cities.

These contributions can really make a huge leap in how we study commons today. They should be seen as new theoretical innovations that put commons more on the map than ever before. And by grouping these new theoretical contributions together, urban commons can make a really big difference in how we introduce new policies as we prepare to transition to a zero-carbon economy. Overall, urban commons also become more strengthened when their innovations are presented this way.

6.2. Regrets, Limits and Further Research

Given that thesis has a certain time frame, there are a few paths to research that I had missed due to a lack of time. There were several theoretical themes and proposals that I evoked in the thesis that could give researchers of the commons a major understanding of how commons work in cities today. Those themes were too briefly explained and deserved a greater presence in my thesis. Had I managed to complete the theoretical concepts in a more detailed and organized fashion, that would have enriched the literature of the commons as whole.

One key regret I have concerning this thesis has to do with providing a comparative analsyis on PPOSUCs. I used one of those, *REMIX The Commons*, as a database for analyzing chartering practices of various ecologically-focused urban commons. But I did not compare *REMIX The Commons* with *Co-Cities*, another identifiable PPOSUC that was discussed at length in section 3.2.1. The thesis could have delved into other PPOSUCs that research other aspect of commons and/or focus on other sectors. Providing more examples of different PPOSUCs and comparing them with each would have strengthened this notion and illustrated how such platforms can be major hubs of research on commons. Indeed, such a comparative analysis would have helped researchers also understand the many types of PPOSUCs and how each is uniquely positioned to advance the commons movement as well. This would have strengthened the theory of PPOSUCs in the commons literature to an even greater degree.

Another key concept that could have been further elaborated is the notion of TURs, the social processes behind them, and how they become pioneering resources for urban communities to use as a tool for climate change resilience. The whole notion of a "transitional resource" should be further developed, as it deserves a more focused definition with clarified theoretical features and boundaries that can really help cities with the ecological transition.

And with the time frame I possessed in doing my research through the *Remix the Commons* platform, and eventually the radio interviews, it was difficult to fully follow the leaders I interviewed in these case studies. I am sure I could have extracted even more information about the commoning process of each case study had I had more time, funding, and capability in the following those projects more closely on a day-to-day basis. While those radio interviews were incredibly useful in obtaining detailed insights about their charters and the commoning processes behind them, that information could have been enriched with more consistent updates on their development. This would have rendered the information provided even more credible.

6.3 Questions and Research Implications for the Future

While there are many research questions that could stem from the research done with this thesis, a couple of them stand out in terms of having a sense of urgency in studying them at great length. The urgency stems from the fact that the commons are certainly growing in recognition and popularity, especially when it comes to the academic literatures. Commons hold a promising set of solutions for the ecological and social crises we face today. And their capacity to attract an outside community to become participative in the commons management and the commoning process shows just how potentially viable they can be to face these crises. But as commons attract more and more partners, there is a certain risk we must pay attention to. Partners may want to exploit the capacity for commons to come up with innovative solutions in collective ways, especially as the crises become more and more pronounced. Such partners could consist of an exploitative state or a market-oriented private actor that may intervene in the humanly natural process of collective management, rule-making, and horizontal subsidiarity. That is why Ostrom was so adamant about making "autonomy" a design principle. Commons cannot function without their autonomy, even though they need partners to fortify their capacity to serve communities. Their collective management requires commons to be fully autonomous so that they can be shielded from undue interference by any authoritative or profit-driven body and thus better serve their communities in need.

Yet it is also true that commons can be vulnerable to the invasion of market-driven ambitions due to their flexibility and openness to attract and form a diverse community with various interests. It is therefore imperative that research on the commons finds more robust methods of protecting the integrity of their collective management, without any outside influence on how they should be governed in the first place. The fact they are not designed to be profitable weakens their position in the economy, and the fact that they require legislative support from authoritative bodies makes them susceptible to the state trying to direct and control the commons.

Methods on how to protect the commons against such risks are extremely important for the future of the commons. This can be done by keeping a rigid theoretical set up put forth by scholars like Ostrom (1990) or Coriat (2015) while keeping the notion of commons flexible and pluralist. It is

important that we find new innovations within commons that can help cities and societies in equitable ways. But if commons are to be a tool for empowering all communities at risk of environmental degradation, the hallmark of commons as defined in the academic literature must be respected. This thesis certainly does that while adding key notions on urban commons that have never been theorized before. That is why we can certainly use this work to strengthen commons in the academic literature, all while respecting the key theoretical frameworks that have been laid out by scholars like Ostrom and Coriat before.

Annex I: The Tactical Chartering Manifesto (TCM)

The Tactical Chartering Manifesto (TCM) is an outgrowth of my work on the *Remix the Commons* platform to create an "Atlas of Charters of Urban Commons." By looking at nearly two dozen urban commons charters, it is possible to discern a clearly articulated set of commons creation and maintenance tasks which the manifesto tries to summarize and structure as follows:

TC Task #1: Getting the community involved

In order to start a constructive dialogue for creation, recognition, or preservation of a commons space, you need to have a range of participants with certain roles as a basis for the process. A project that deals with changing or updating the urban fabric must include the input of the people living in and around that project in order for it to be successful. Projects become successful when people are able to voice their concerns within a given area. But it is not just concerns that various involved organizations and municipalities should hear. There is also the need to hear what people think is the best tactic to change. People will disagree on this, but hearing out all the sides will help assess which is the best tactic to change or place an urban commons in a given area. In fact, certain organizations can have the responsibility to communicate with those people to see how they understand the area and what they want changed. Certain ways to approach this are:

1) Questionnaire Development and Interview Participation: Questions should be organized to find out the identity of a neighborhood, clarify what general qualities and problems exist, and explain what a path forward would look like in terms of neighborhood improvement.

2) Townhall Meetings: Perhaps best organized to take place in the urban commons itself, these are good occasions for organizations to communicate with residents. Participants can explain how they see the problems concerned and also voice opinions about various solutions proposed. Townhall meetings often involve a variety of panels to keep discussions focused around specific themes. They are also good tools to advertise the existence of commons projects through social media and reach possible target audience through some type of sign-up sheet platform.

3) Leadership Facilitation: Everyone should voice their opinions on what a leader should look like in facilitating these meetings. That will make it easier to decide on the leaders. The persons facilitating this selection process should be precisely those activists most interested and adamant about being involved in the chartering process of an urban commons.

4) Social Media Facilitation: People can see highlighted plans and then use the social-media platforms concerned to add comments of approval/disapproval that would help mediators further understand what would be best for the neighborhood.

5) Creating Political Outlets: Commons need to serve as political outlets for marginalized groups who feel that the current state of affairs cannot provide adequately for their needs. Urban commons can serve as a political platform to get a group's voices heard. Such political outlets may also take the form of manifestations or petition signing.

TC Task #2. Assessing the physical aspect of the space

Assessing the physical aspect of a space means that inhabitants are able to define clearly what the space is and how they use it within its realm. One has to understand why a place has degraded, why it is threatened, or threatening to a neighborhood, or why it needs to be preserved, and how it provides advantages to the neighborhood. Such concerns must be voiced in a given area so as to better understand what solution is appropriate. One also needs to learn the boundaries of the place and exactly what the diameters are to determine whether the space is based on enclosure or whether the space is shared. The physical aspects of the space determine how 'communitarian' it is. Also, is the space divided into specific individual parcels? Or is the space entirely open within its boundaries? Openings and access to this commons from different angles are also very important details in assessing how to turn a space into a commons. The commons needs to be accessible from as many angles as possible so that it can be a place for all surrounding communities. Determining access points is thus an important exercise which also helps determining whether this commons supports enclosure or shared communal spaces.

1) Occupying Neglected Spaces: Vacant spaces are all over cities, and they often are abandoned

because of regulatory slippage or government/private failures. These pockets of space can serve as opportunities for commoners to have a property in which they can perform socially or ecologically useful activities for the neighborhood. Occupying a space that is not yours is considered illegal. But if it is for the greater good of a neighborhood, then it is most likely to gain the legal support of local government. In turn, it then becomes cheaper for the government to maintain that property, because it is now in the hands of commoners who care about the space.

2) Condition Identification: One has to identify whether the commons in question will preserve a shared physical space or whether repairing/improving a degraded shared physical space is needed. Such identification determines the specific steps needed to achieve the common objective associated with the space.

3) Fencing Detection and Enclosure Recognition: Commoners need to determine where any fences protecting the commons end and/or what the boundaries of any enclosure are.

4) Access Points: Similarly, commoners need to determine access points and what direction they serve. It needs to be clear what points people come from and why they do so.

5) Physical Mapping: With the help of an actual map of the neighborhood, people can fill in what they think the boundaries of the commons space are, which parcels of the neighborhood they use most, and what places people actually use in the area surrounding the urban commons.

6) Digital Mapping: Commoners should use open-source mapping platforms to map out and geo-locate the commons, its various devices, and physical areas that are either problematic or useful to the functioning of the commons itself. Such mapping can then be broadcast, shared, modified by users, and presented to other involved groups.

TC Task #3: Assessing the social aspect of the space

Assessing the social aspect of the space involves observing the communication between people who use the space. It also involves clarifying what people see within the space and how they use

it. The best way to show this is by having people draw a mental map of the neighborhood the shared space is in, then perhaps asking them to detail the shared space itself. People drawing more objects or features of personal interest can be assumed to have a closer relationship to the space, and they may therefore also have a better idea of what is best to do for the neighborhood. We can use statistical measurements to see what objects people draw the most. Then there could be a special focus on that specific aspect of the shared space.

1) **Mental Mapping**: The social psychologist Stanley Milgram's (1976) concept of "mental mapping" (see also www.mentalmap.org) recognizes the fact that people walk around drawing cognitive maps in their heads of their neighborhoods or otherwise familiar areas in which they record and recall at will all the relevant information of their everyday spatial environment. We can use the tactical chartering exercise to engage prospective commoners in drawing their mental maps so as to emphasize how they literally see their neighborhood and identify what is important to them about this neighborhood.

2) **Drawing Boundaries:** It is highly significant to have people specify what they see as the boundaries of the neighborhood in question and compare those with its actual, often objectively determined borders. Discrepancies in that regard could be strictly physical and/or administrative. But, more interestingly, they may also be social and as such reveal demographic and political barriers. This exercise is not least relevant in terms of figuring out access to the commons project, specifically who is going to be inclined to use it.

3) **Utilization Priorities:** It is also important to figure out what a given urban commons will be used for, specifically whether it will provide ecological, social, or economic benefits. For example, if people mark food places in their mental maps, then the urban commons might provide bench tables and recycling resources so that people can sit down, eat their food, and recycle what's left properly.

TC Task #4: Finding stakeholders and making decisions

The stakeholders include everyone interested in being part of the planning of an urban commons. One has to find interested participants to give a project some friction. Neighborhood locals can be very vehement about participating in the urban common development, and these people will have a myriad of ideas to share and put forth in the planning exercise. In order to find those people, signs can be posted around recreational centers that explain what is going on and how people can get involved. The use of social media will also attract people into becoming participants. The organization around meeting these participants must be fair so that everyone has a roughly equal chance to be heard. People should be able to share ideas with one another. Once the participants have been brought together, there can be discussion about the kind of decisions that need to be taken and how each decision process will affect an urban space. It is particularly hard to move forward on any decisions when many people have completely different opinions on what is right for the space. That is why the dialogue has to be set up in an organized matter, meaning that the forum will have to have a certain schedule allowing individual groups to present their case. There should also be a note-taking moderator who can identify similarities of what people say in terms of problems mentioned or specific themes being evoked.

1) Collective Action: Commons typically involve collective action by a group of people acting together in the pursuit of a shared objective (Gilbert 2006). Commoners, after all, need to work together in order to manage and preserve a resource they wish to share the benefits of.

2) Roles of Responsibility: Each stakeholder must have a clearly assigned set of responsibilities that helps nurture the urban commons. Such allocation of roles can be usefully undertaken in the charter and may actually already start with the process of writing the charter. More and better group organization can help a charter become more clearly defined, render the process of its formulation more efficient, and incentivize people to participate actively. It helps when everybody knows what is expected of them.

3) Democratic Decision-Making Approach: The process of setting up and managing a commons requires groups to make key decisions, as does writing a charter together. The most important

decisions require a process of forming majority consensus, often by vote. It is important for the credibility of the process, and also for the quality of the decision-making outcomes, that active participants have a say and that their input, not least of which their votes, are given equal weight. Commons and democratic decision-making approaches go hand in hand.

4) Integration of Supporting Actors: A crucial dimension of tactical chartering is the mobilization of all relevant stakeholders who are committed to the democratic governance principles of an urban commons project and willing to provide support through participatory action research or legal/financial support. It is useful to keep in mind the wide range of possible actors providing active support to urban commons whose integration may make an important difference to their success. Friends groups comprise cooperating associations or non-profit collectives made up of activists and experts which assist in the production of site-specific products, distribute educational and scientific publications produced by agencies, donate materials for use in interpretive programs and exhibits, and work to secure grants and funding. Park conservancies are nonprofit organizations raising large sums of money to co-manage large urban parks in partnership with local governments. Non-governmental/non-profit organizations are permitted to generate surplus revenues which they retain for purposes of self-preservation, expansion, or realization of plans in pursuit of their objectives, rather than paying them out as profit or dividends. Urban commons usually end up having to deal with municipalities and other administrative bodies of local government (whereas counties or departments may encompass rural territories and encompass various small communities such as towns, villages and hamlets). Small local businesses can play a very helpful support role providing needed goods or services to commoners and their project. Platform co-operatives, typically cooperatively owned and democratically governed by workers, users, and other relevant stakeholders, run web-based platforms or mobile apps which may offer urban commons a variety of useful digital services and help propagate their existence. Finally, academic researchers, who are experts in developing academic or professional research for the community to undertake a systematic investigation of a problem or situation, often assist in finding solutions which help urban commons.

TC Task #5: Understanding the character of the neighborhood

Each neighborhood has a distinct character, because it has been shaped by its history. Knowing that history will yield superior knowledge to what this neighborhood and its people represent. Its history is what brings out the character of a neighborhood, and any addition to that neighborhood must consider the past in order to keep its character alive. Commons in particular must embody that character, so that the neighborhood can keep being a place that is properly represented by the people. In order to do that, one has to talk to the people of the neighborhood who have been there for a long time and so have had a chance to see the place evolve over many years. Some people will give you historical accounts of major social events, protests, movements, and leaders, all of which shape the identity of a neighborhood. Understanding that will allow the formation of the commons to highlight these historical accounts. As a result, people will feel more connected to the commons as a major part of this neighborhood and reflection of its character. Story sharing is a key tactic here. The best way to do that in the tactical chartering process is by asking locals in the neighborhood what the past was like and what stories they would want to share with others in the neighborhood.

1) Tactical Story-Sharing: Most residents living nearby have a long-standing relationship with the neighborhood they live in. Sharing their stories and putting those together in a shared space can enrich the presence and function of urban commons serving those residents.

2) Cultural Awareness: Each neighborhood has a story of people moving in and out. In the process people place their culture within the neighborhood as one facet of its legacy and history. It is important for a shared space to enhance the culture of a neighborhood, and this can be done by working with inhabitants and small businesses to see how a shared space can become a part of their day-to-day life.

TC Task #6: Understanding the qualities of the neighborhood

It is important to find out how people relate to their neighborhood, and what qualities they share that make this place a pleasant and fun place to live in. Bringing out the positivity in a neighborhood will entice people to feel a strong connection with the place and be more motivated to maintain it so that it is preserved and not degraded. When people are reminded what they like about their neighborhood, they will be more inclined to participate in the chartering process. Detecting of qualities makes people proud. The urban commons should be a place that encapsulates these qualities so that people in the neighborhood will want to use this space as an embodiment of these qualities. The best way to do that in the chartering process is to ask residents what qualities they find while living here.

1) Educational Programs: Urban commons should provide educational programs to a variety of groups to spread knowledge about societal or community-based issues. It may be helpful to extend such programs to include technical know-how on certain processes and mechanisms of production, development, and critical thinking.

2) Events and Festivals: Urban commons should host major gatherings within their community to promote their objectives, make local residents more aware of those, and develop social relationships. Such events, especially when taking the form of festivals containing a series of different events and attracting large numbers, tend to increase support for the urban commons. They help urban commons embed themselves more effectively in their local context.

3) Social Programs: Urban commons should help communities by providing some social services through relief and assistance programs that help the greater good of the community.

4) Short Circuits: Urban commons should, wherever possible, be actively involved in helping develop an economic system in which each community can build an independent local economy capable of supplying key goods and services its residents would need in case the mainstream economy collapses. Given a growing number of systemic threats to our mainstream economy, from massive incidences of financial instability to pandemic-induced lockdowns and catastrophic

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weather events, such so-called "short circuits" (Douthwaite 2003) may include local currency systems, self-reliant community banks, decentralized energy supplies, and food storages.

TC Task #7: Communication

Once it is decided who will participate in the tactical chartering exercise towards realization of an urban commons project, a dialogue can take place where people get their needs heard. Organizations will take note of those needs and then present interested parties with solutions of which they can be part of. Such communication fosters the emergence of networks to which people feel drawn, making possible concerted outreach efforts. The more people participate, the more value urban commons could potentially hold. Such communication has to be fluid and organized, aiming to get as many voices heard as possible.

1) Group Creation, Division of Responsibility: Group formation is a defining aspect of tactical chartering, to the extent that writing charters is also always an exercise in mobilization of people. But such group formation should not be left to chance. When groups form, it would be very useful if they took on distinct and well defined responsibilities to take care of specific problems that need addressing. Groups should also commit to a modicum and method of communication.

2) Community Conversation: It is really important to generate and sustain a community-based conversation which assures projects staying alive to get realized. So, there should be a dedicated space of deliberation where community members get to know each other and discuss local issues of mutual interest. Roundtables and/or general assembly meetings provide a good format for such community conversations discussing local issues and how commons can help address those.

3) Working Groups: Tactical chartering, the process surrounding the writing of charters to facilitate the launch of (urban) commons or their continued survival once set up, lends itself logically to forming groups of activists and experts getting together to achieve specified goals. Since such working groups focus on specific subject areas, they typically end up playing a big role in dividing up distinct roles and responsibilities of commoners within groups as well as between

the different working groups clustered around the commons project. Such self-structuring plays often a positive role in getting charters done.

4) Network Formation: People should be trained to reach out to as many people as possible when recruiting for urban commons involved. When activists engage with other people in their outreach efforts, they should ask for recommendations who else to talk to. Networks created this way must be officialized, documented, and expandable. When a problem is brought up by two different sources or gets pointed out at two different locations within that neighborhood, then there should be a follow-up procedure of meetings and discussions to shed more light on the issue raised here. This may eventually lead to a sub-movement within community conversation.

5) Co-creating Rules of Use: Each commons has a set of rules which commoners must decide collectively and enforce to ensure proper governance of the commons.

6) Conflict Resolution: Conflicts are bound to happen in collective situations, so it is important that each commons develops the tools necessary to come up with conflict resolution procedures. Those may involve building teams for greater inter-group solidarity, mustering of collective support, encouraging social activities outside of the commons, keeping the collective interest at the forefront of decision making, and offering resources for arbitration to resolve conflicts in the absence of consensus or agreement.

7) Writing the Charter: The process of writing a charter is collective, and each person must be involved with rule setting while using specific competencies to help advance specific legal or social criteria. Writing the charter is what helps commons become fully functioning entities. Charters can also provide legal and jurisdictional grounds for the commons to exist and develop.

TC Task #8: Coordinating with relevant government bodies

There must be a certain level of organization in order to approach a government about future development plans in a neighborhood. Often enough the relationship between commoners and relevant government bodies, usually municipalities, involves a certain division of labor rooted in

a negotiated agreement for which charters can play a useful role. Governments are often subject to regulatory slippage when managing shared green spaces in a city (Foster 2012), a widely recognized government failure to maintain adequate vigilance and support resources over time. So, communities can assume the role of setting up rules and surveillance mechanisms to protect and preserve an urban commons. Governments in return should officially recognize these commons as independent and functioning institutions in order to offer them needed protection and support. Such government backing will protect the commons from becoming a parcel of private property. It will also help prioritizing financial support, including by foundations and local businesses, which often enough are crucially important for the permanency of urban green commons. In other words, governments might create and enforce de jure rights for commoners while at the same time recognizing and supporting de facto rights for commoners who wish to create, manage, and maintain the urban commons site. De jure rights will provide adequate and reliable protection, while de facto rights, in conjunction with de jure rights, encourage collective action and provide several guidelines for commoners to use and maintain the urban commons.

1) De Jure Rights: Governments use formal and legal instruments explicitly granting rights to specific individual resource users which can be enforced by the available judicial apparatus. This implies that any conflicts within property rights can be settled in a judicial setting, like a court.

2) De Facto Rights: Governments can also use informal institutional arrangements to determine how resource use should be organized by individual users who are not officially recognized by government bodies. Much of the validation of such de facto rights depends on common law practice, recognized rights of use, and tacit (or explicitly stated) official approval.

3) Charter Publishing/Sharing: Writing a charter is important not least for government approval of the commons project anchored in the charter. Both de jure rights and de facto rights can be more easily granted by the competent authority on the basis of a written charter thus approved. When the charter writing process has been finalized, authorities will need to be given access to the criteria of that charter. When a charter is published, that means that the community has collectively decided on the functionalities and mechanisms of that commons. Government authorities should

review this to determine its importance to a community and its legal set-up helping the commons mesh into the community.

TC Task #9: Putting a label on the urban commons

It is important to recognize that each commons serves a different purpose for a specific area or region. This means that urban commons differ from one another, each with a different objective. Having general classifications and labelled types of commons makes it easier to determine the differences and similarities between various commons. This will create transparency between commoners and governments. Most importantly, it will help commoners share and distribute information about their commons, based on relevance and experience. For example, any commons with a specific goal can communicate with another commons that has been labelled in the same way, making the information transfer focused, reliable, and efficient. Such focused information distribution helps foster the networks necessary to keep this commons movement growing. The labels that may be used can also be found under 'Key Concepts' in the *Remix the Commons* website (https://www.remixthecommons.org/en/partager-le-vocabulaire-des-communs-2/).

Labelling of commons may identify them as addressing ecological problems. Communities may suffer from ecological problems such as pollution, lack of green spaces, presence of brownfield sites, lack of composting, and so forth. Identifying the ecological issues of a neighborhood can help determine how the commons can respond to those problems. Labelling of commons may also identify as addressing social problems. Communities can face social problems like crime or lack of funding for specific public services or fragile populations becoming more marginalized. Identifying these issues can help the commons become a source of greater good for these populations if those social problems are clearly identified and commons appropriately categorized by the labels they chose to be characterized by. Labels may ultimately also make it easier for commons to develop needed contracts with the authorities to help commoners legalize their commons and negotiate what is important for them. This can become crucial in getting a lease for a shared property or getting financial support for an initiative created by the commons that helps the greater good of the community.

TC Task #10: Securing the longevity of urban commons

Urban commons should strive for permanency, or at least longevity. Often enough they start out as temporary arrangements, such as for instance community gardens which are often allowed to function until the vacant lot on which they lie is put under construction by a private developer. The permanency of these community gardens then depends typically on well-organized collective action and effective local governance to develop a strong appearance or aesthetic that adds to the character of the neighborhood. Such permanency is key to learning lessons for improvement, documenting experiences for better understanding, and delivering a higher-level quality of lifestyle for urban residents in the long run. As people use an urban common more frequently, they will be incentivized to manage, improve, and protect it. The more active and norm-abiding users are within a commons, the more residents, municipalities, and other actors will see such a commons as an entity that deserves to stay. Long-lasting urban commons are also of vital importance to keep the general commons movement relevant and growing.

The conditions for assuring the longevity, or better yet permanency, of urban commons are fairly well known. They must be adding something useful to the neighborhood they are located in, and that positive contribution must be fully recognized by the residents who stand to gain from the continued presence of the commons. They need to have the ongoing support of activists willing to dedicate time and effort to build and preserve the commons. Collective self-management of the commons will need competent and dedicated groups of people who interact well with each other, able to garner the support of the local community and the engagement of other supporting actors. Active support by the relevant authorities and government agencies is also needed, often a matter of decisive importance. The governance mechanisms guiding the operation of the commons has to be at once democratic, yet also efficient in making key decisions and putting those into effect. Tactical chartering is a crucial process putting all these conditions into effect.

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