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Diversity and Challenges of the Urban Commons: A Comprehensive Review

RESEARCH ARTICLE

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ABSTRACT

This study is a comprehensive literature review about the field of the urban commons and its diversity, which we investigate through the lens of the *new commons*. Acknowledging a potential for adaptive capacity in the urban commons, we classify its traits into ecosystem, socio-economic and institutional factors. To make our work more practical, we further arrange them as benefits, challenges or supports. Our literature review highlights the need to further study the institutions which have an impact on the urban commons, as well as the individual and collective behaviour mechanisms at stake in the emergence and management of this commons. In addition, more light needs to be shed on the property-regimes relevant to the urban commons, with a focus on the access or use rules, rather than on ownership.

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INTRODUCTION

The urban commons has gained a growing interest over the past decade, both in the field and in the scientific community. An urban commons represents shared material, immaterial or digital goods in an urban setting (Comune di Bologna & Urban Center Bologna, 2014). It is beneficial for the individual and collective well-being, and the degradation of the urban commons is perceived as a loss. It is built around the social issues of participation, collective action and self-organisation which are reflected through the term commoning: collectively creating, using and managing the commons (Linebaugh, 2008).

The city forms a complex ecosystem of places, people and machinery, bound by institutions. An urban commons is produced and reproduced through the encounter of the city ecosystem's elements (Borch & Kornberger, 2015). Such encounters contribute to the creation of shared understandings through repeated interactions and practices (Wessendorf, 2014), which induce social learning (Wenger, 2010); a key element to adaptation (Armitage et al., 2011).

Multiple studies have highlighted the urban commons as a potential carrier for urban resilience (Camps-Calvet et al., 2015; Colding & Barthel, 2013; Mundoli, Manjunatha et al., 2017). Although both socio-ecological and socio-technical networks intervene in the adaptability of urban systems (Meerow et al., 2016), the most recent paradigm of resilience thinking is about social-ecological resilience, with adaptability rather than robustness as its key characteristic (Quigley et al., 2018). Studying the urban commons from the perspective of its socio-ecological components, therefore, appears valuable, notably for the practitioners who worry about the survival of their initiatives.

Although diverse fields address the urban commons, there hasn't been a thorough investigation of its diversity, nor of its internal and external characteristics which influence its access, use and management. Beyond building a state-of-the-art review of the diversity of the urban commons currently observed and studied, we point to the benefits that an urban commons brings to cities, and to the challenges of this emerging field which call for future agendas in urban commons research.

1 THEORETICAL LENS ON THE URBAN COMMONS

1.1 COMMON, COMMONS AND COMMONING

We distinguish three frequently used terms: common, commons and commoning.

The term *common* describes the foundation of shared material and symbolic resources based on which humankind can live together: it spans from natural resources to digital wealth (Hardt & Negri, 2009). The common is a perspective of a societal transformation involving practices of mutual sharing and collaboration.

The *commons*, singular noun, represents mutual goods which result from institutional dynamics and arrangements built on the foundation of the common (Teli et al., 2015). Under certain conditions, the commons resembles the common-pool resources (Foster & Iaione, 2016) which are characterized by non-excludability and rivalry (Ostrom, 1990), with an additional "social value or utility" (Foster & Iaione, 2016, p. 288). It can take multiple forms, as mapped by Hess (2008), with different ownership regimes (see subsection 1.2, 1.3).

Commoning is the practice which links a resource to its nearby community of users (Foster & Iaione, 2019). It produces the commons (Noterman, 2016). Multiple scholars anchor the commons to property relationships, whereas commoning is perceived as a process which exceeds property and capital issues (Cooke et al., 2019; Leitner & Sheppard, 2018). Commoning thus becomes a creative force, a potential to generate new forms of urban spatiality (Eynaud et al., 2018; Linebaugh, 2008; Montagna & Grazioli, 2019; Ruggiero & Graziano, 2018).

We here define the commons as a *system consisting of a resource, its users, the institutions binding them and the associated processes*. The term urban commons first evokes a paradox. Historically, the commoners expelled from common lands formed the nowadays city dwellers (Huron, 2015; Thompson, 1966). Living in cities with waged labour, they contributed to capitalism which opposes commoning. The urban commons is therefore produced by the collective practice of commoning, to "govern the resources necessary for life" (Huron, 2018), in a predominantly capitalist environment. With increasing urban cultural diversity (Colding & Barthel, 2013), the urban commons merges multiple potential motivations and take many shapes, many of which belong to the new commons (Hess, 2008), introduced next.

1.2 THE COMMONS MAP

Hess (2008) classifies the commons across the following sectors: cultural, knowledge, markets, global, traditional, infrastructure, neighbourhood, medical and health commons. These "new commons" cover their multiplicity. It is in our view the most recent, exhaustive and popular classification of all types of commons, notably taking into account digital technologies. We postulate that the urban commons spreads across these sectors, bridging their tangible and intangible elements. In Hess' classification,

each of the sectors consists of various types of commons. Our literature study reveals that most of these sectors are relevant in the urban context. We have therefore adapted this map in *Figure 1* for in the urban commons context.

We added two concepts that were highlighted in our initial literature corpus (Appendix 1, see subsection 2.2) but were missing in Hess's classification. "Parks and Greenery", in the neighbourhood commons sector, is particularly relevant in the urban context. It was mentioned by 30 articles within our initial corpus (Appendix 2, see subsection 3.1). Urban parks and neighbourhood greenery are in our view too specific to belong to the traditional commons sector, for example within the forest type. They play a larger role in the neighbourhood life, which is why we appended this new commons type within the neighbourhood sector. We also added "Experts Knowledge" within the knowledge sector to characterise the formation and spread of commoning initiatives in the urban context. It is addressed in 20 articles of our initial corpus. Several new commons types, indicated in light font in *Figure 1*, were not encountered in our corpus. Finally, we have renamed the neighbourhood commons type relating to the homeless. We find it a misleading term, which we understand is meant by Hess as the space or habitat used by homeless people, which becomes a resource (Staeheli & Mitchell, 2006). We have renamed it consequently homeless habitat (*Figure 1*). Thus adapted, Hess' classification illustrates rather well the diversity of the urban commons.

1.3 PROPERTY

More attention is needed on the urban commons diversity and its access rules – restricted or shared access (Davy, 2014). The urban commons occurs on both public and private land, thanks to specific property-regimes and access rules, as explicitly mentioned by 37 articles of our corpus.

The leading theory mentioned about property-rights regarding the commons is about property rights bundles (Schlager & Ostrom, 1992): it spreads the possible rights (access, withdrawal, management exclusion, alienation) across diverse key positions (owner, proprietor, claimant, authorised user, authorised entrant). The enforcement of these property rights bundles is done through property rights regimes (Colding et al., 2013):

- open-access regime (also called *res nullius*): no-one can be excluded unless by prohibitive costs (e.g. urban biodiversity (Colding and Barthel, 2013));
- state property regime: the property is owned by the state in the name of all citizens (e.g. Central park in New York (Hess, 2008; Sevilla-Buitrago, 2014));
- common property regime: the property is owned by a group of individuals (e.g. R-Urban strategy in the Paris area (Petrescu et al., 2016));

- private-property regime: the property is owned by a private owner or a group of legal owners (e.g. collective use of private yards in Minneapolis (Lang, 2014), privately-leased land in Sydney harbour (Boydell and Searle, 2014)).

Rose (1996) has made a distinction about public property: it is a good either owned and managed by a government body, or a good collectively owned by society. When defining public space according to this definition (Bruun, 2015), the issue is not a binary one (ownership or no ownership), but rather a complex combination of rights. In a given urban commons, all property rights bundles and regimes may co-exist, as rights and responsibilities are spread across the diversity of actors interacting with the commons. It is the commoners' criteria of exclusion and inclusion which condition the openness of a given commons (Noterman, 2016). The distinctions above guide the analysis of our corpus.

2 METHODOLOGY

2.1 JUSTIFICATION OF THE REVIEW

The urban commons appears in many fields of research (*Figure 2*). After social sciences, environmental sciences and urban studies fields, engineering and computer sciences account for around 11% of our corpus articles, reflecting the importance of digital communication technologies in the contemporary urban commons. The diverse fields of research potentially suggest a multiplicity of the urban commons.

An urban system is indeed complex: its components exist not by themselves, but in their interaction with others and under many externalities (Foster & Iaione, 2016; Radywyl & Bigg, 2013). In real life, urban commons initiatives do not necessarily affect one another directly. However, at a meta level, the knowledge on the urban commons is built through continuous additions and exchanges of information. The knowledge about the urban commons is a patchwork built on multiple inputs from multiple science fields and practice. These inputs can be based on past experience, on reason and on pure testimony. Therefore, we take an assemblage thinking approach for our review. Originally developed in *A Thousand Plateaus* (Deleuze & Guattari, 1980), this approach has since then allowed taking a wider perspective in social complexity studies (DeLanda, 2006).

Assemblage thinking is "a mode of relational thinking that approaches an object of interest, and theorizes about it, not as a pre-existing whole (an essence) but as a whole emerging from the coming together of heterogeneous, co-existing and co-functioning components that creates agency, an assemblage" (University of the Aegean, 2017).

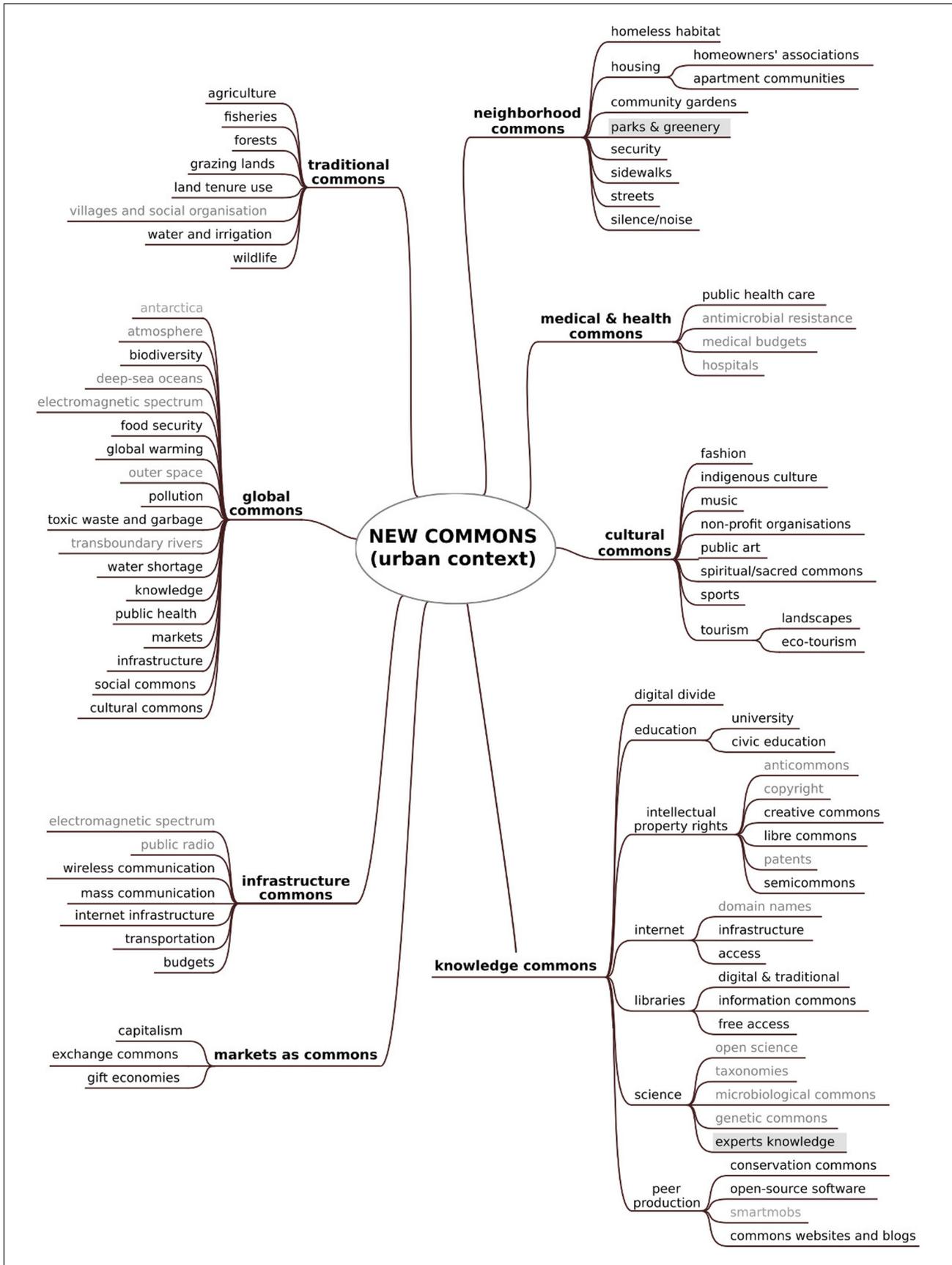


Figure 1 The new commons in the urban context, adapted from Hess (2008). Highlighted are the commons types added by us. In light grey font are the new commons not found in our literature review.

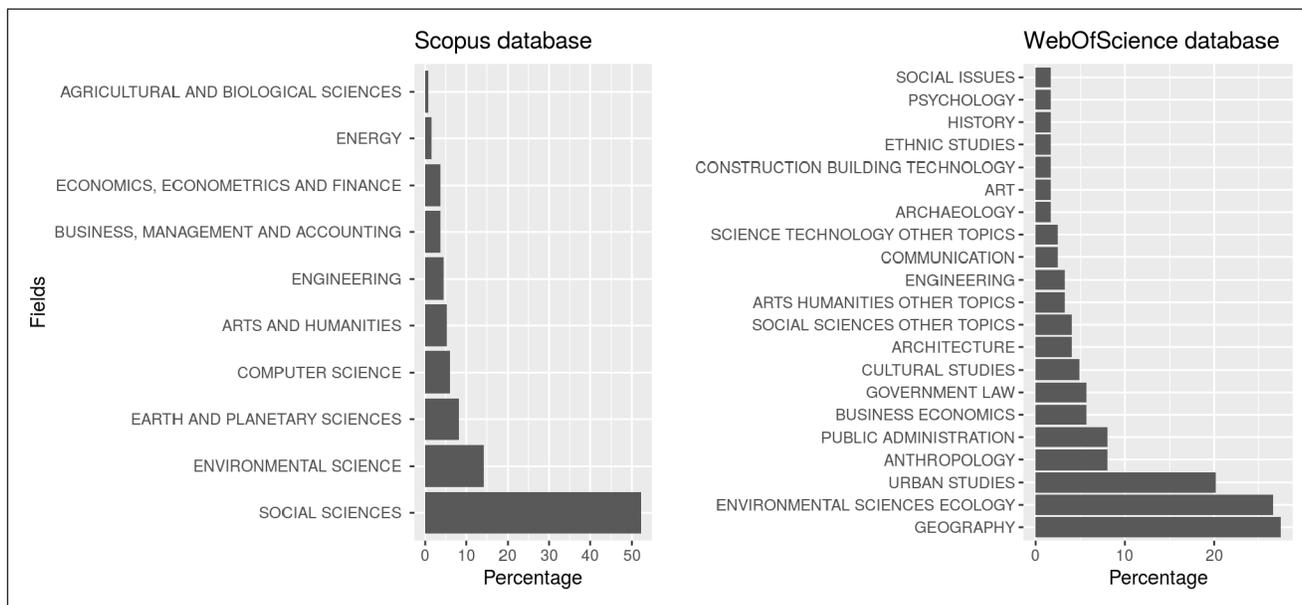


Figure 2 Weight of each research field in our urban commons corpus, expressed as a percentage of all articles and books, either in Scopus (left) or WebOfScience (right) database.

The “known” of the urban commons is thus forged by the “knower”. With the assemblage approach, we intend to embrace the heterogeneity projected above in a transparent process towards the “known”.

2.2 METHOD OF ANALYSIS OF THE URBAN COMMONS LITERATURE

Given the anticipated heterogeneity (*Figure 2*), we study the urban commons under the lens of Hess’s adapted map (*Figure 1*) to build an assemblage of knowledge on the urban commons.

In a first search using Google Scholar, we isolate several keyword synonyms with the notion of urban commons for further article selection: “urban green commons”, “urban ecological commons”, “cultural commons” and “digital commons”. The last two expressions must be linked to the keywords city or urban. We then opt for a snow-ball search in Scopus, WebOfScience and Proquest’s ABI/INFORM database, to only select relevant peer-reviewed publications. We select our initial corpus by browsing all peer-reviewed articles with abstracts or titles containing the exact expression “urban commons”, or recurrent synonyms of urban commons as found through Google Scholar.

After including the additional keywords in the initial query, ensuring they are meant in an urban context and removing the possible duplicates, we obtain a total of 167 results from Scopus, WebOfScience and Proquest (ABI/INFORM), spanning from years 1979 to 2019.

We build our analysis on a theoretically recognisable 2-dimensional structure. As we have already observed

the potential of the urban commons to trigger adaptive capacities, our first dimension follows a framing that is often used to evaluate adaptive and collaborative resource management systems (Conley & Moote, 2003; Plummer & Armitage, 2007) with three components: ecosystem, socio-economic and institutional factors. Our second dimension categorises our results across three practical characteristics: benefits for cities or communities, challenges and what can support the urban commons.

3 THE URBAN COMMONS IN PRACTICE

We provide through *Table 1* a roadmap of our literature review analysis.

The number of research articles which refer to each argument are mentioned in [brackets] in the coming subsections. The detailed count is accessible in appendix 3.

3.1 URBAN COMMONS TYPES

All new commons sectors in Hess’s typology are almost equally represented in the urban commons discourse (details in appendix 2), exceptions made for a minority of infrastructure commons, markets as commons and medical health commons (*Figure 3*). Those are generally public services under the responsibility of the welfare state (Susser & Tonnelat, 2013; Foster & Iaione, 2016). As for the Market Commons, there are only few cases of locally made goods being sold, exchanged or gifted: shopping centres (Berge & McKean, 2015), Smart City initiatives (Leitheiser & Follmann, 2019; Teli et al., 2015), free space or products

	BENEFITS	CHALLENGES	SUPPORTS
institutional		<ul style="list-style-type: none"> governance structure: rigidity, bureaucracy autonomous governance land availability and access group size and scaling-up 	<ul style="list-style-type: none"> direct/indirect institutional support beneficial multi-actor co-operation
socio-economic	<ul style="list-style-type: none"> livelihood economy: value co-creation and shield to crises recreation and health collective identity empowerment 	urban commons as a response to neo-liberal threats <ul style="list-style-type: none"> social tensions conflicting values and norms financial viability knowledge quality and mismanagement 	<ul style="list-style-type: none"> civic consciousness media communication expert and peer knowledge provision
ecosystem	<ul style="list-style-type: none"> ecosystem services: biodiversity, soil fertility, de-pollution, climate mitigation 	<ul style="list-style-type: none"> urbanisation: scarce land and pollution evolving interactions of urban society with urban greenery 	

Table 1 Summary of the practical analysis of our urban commons corpus.

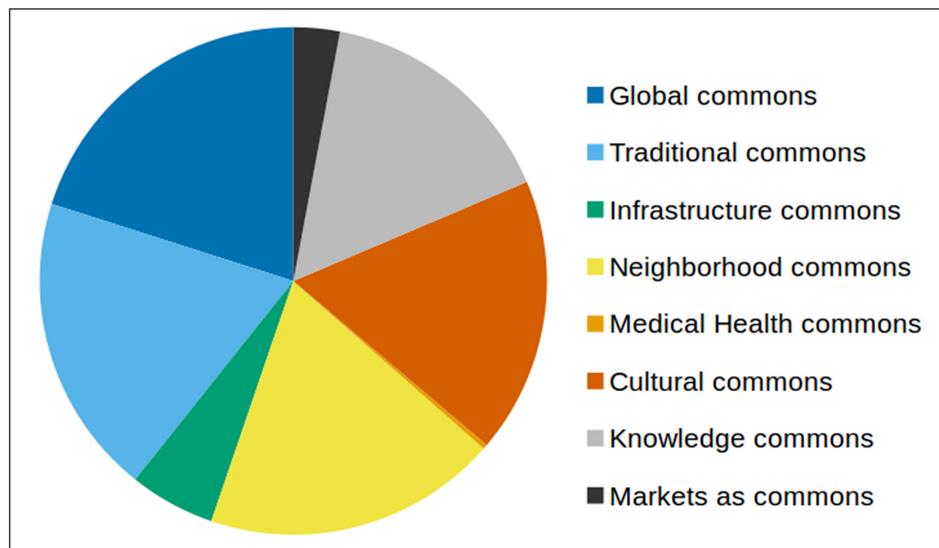


Figure 3 Urban commons sectors by proportion of occurrence.

(Arora, 2015; Susser, 2017a; Susser & Tonnelat, 2013). Most of the urban commons are generated and used by the community itself. This credits our initial intention of observing the socio-ecological processes of the urban commons.

Regarding the types of commons (appendix 2), the four new commons types most recurring in the urban context, after our literature analysis, are: land use and tenure, indigenous culture, parks and greenery, and peer production of knowledge. From the predominance of land use and tenure in literature (76 studies in our corpus), we can infer that space is a key resource for commoning in the city. It is the primary tangible commons in cities, from which

other commons directly derive: agriculture, parks, housing, education or infrastructure. It is the resource most affected by property-rights regimes. Given the growing urbanisation and the saturation of urban space (Di Feliciano, 2017b; Huron, 2015; Williams, 2018), we can understand to what extent the subsistence of a tangible urban commons is dependent on the availability of urban spaces. Indigenous culture belongs to the cultural commons and describes the lifestyle of urban citizens and their concerns for livelihood, which are the means to secure the necessities of life, and for alternatives to consumerist urban lifestyles (Bowers, 2009). Parks and greenery are associated with a quest for well-being, through recreational activities (Robson et al.,

2015) or connection to nature (Łapniewska, 2017). Finally, peer production of knowledge is a global term which often applies to digital technologies (Wi-Fi, online platforms) through which knowledge can be generated and shared among community users (e.g., Cantone et al., 2014). Art dissemination is another example of exchanged knowledge (Middleton & Crow, 2008).

3.2 BENEFITS

3.2.1 Socio-economic factors

Livelihood support

This is a recurrent argument not only in developing countries, but also in developed countries when it comes to urban farming, gardening and some cultural practices. The urban commons provides populations with means of subsistence [66]: agriculture, fishing, irrigation, sacred practices, household uses (e.g., Derkzen et al., 2017). Additionally, 12 studies reported the health benefits of commoning: through the de-pollution role of green spaces or through the positive effect of recreation in urban spaces on physical and mental health (e.g., Shah & Garg, 2017).

Recreation

The urban commons provides opportunities for recreation [19], connection with nature [18] and a global positive feeling [12] (e.g., Colding & Barthel, 2013;).

Identity

Commoning helps create both an individual and collective sense of identity: a social consciousness and system of values built progressively around experiences shared by different individuals [58] (e.g. Borch & Kornberger, 2015). It gives communities a way to deal with societal crises by triggering social resilience, which is the ability of social entities to cope with and adjust to environmental, political or social threats (Colding et al., 2013; Mundoli, Manjunatha, et al., 2017; Schauppenlehner-Kloyber & Penker, 2016; Shah & Garg, 2017).

Commoning additionally provides a strong sense of community empowerment [62]. For example, Community Land Trust housing projects include citizens in the development and construction phases (Aernouts & Ryckewaert, 2017; Bunce, 2016). Commoning is seen as a way to express or claim one's civic rights not only as an individual but also as a community. The gained autonomy gives the chance to shape products and services which best fit the community's interests. A key component for this are the democratic values which commoning promotes [56] (e.g. Łapniewska, 2017).

The urban commons represents place-making opportunities [40] for citizens. Places are claimed or re-used in

a way which fits a community's needs. Examples of this include meeting places (e.g., Aernouts & Ryckewaert, 2017), gardening lots (e.g., Camps-Calvet et al., 2015), housing through squats (e.g., Di Felicianantonio, 2017b,) or street contestation movements such as Occupy, Squares Movement, Indignados or Nuit Debout (Radywyl & Bigg, 2013; Stavrides, 2016; Susser, 2017a, 2017b).

These places also represent an opportunity for social integration [44], cultural diversity [45], education [35] and co-production [28]. They allow the expression of values such as mutual care, confidence, solidarity and a sense of security (e.g., Arora, 2015).

Economy

The urban commons can help increase or create economic value in the neighbourhoods [23], through the provision of goods and services (e.g. Foster & Iaione, 2016).

The socio-economic context is usually a strong motivation for commoning [40], such as economic crises (Di Felicianantonio, 2017a; Huron, 2015), housing crises (Aernouts & Ryckewaert, 2017; Bunce, 2016) or the welfare state drawback (e.g., Camps-Calvet et al., 2015). In the case of economic depression, urban disinvestment, decay and fiscal cuts can happen, eventually leading to insufficiently maintained public parks and a weak provision of social goods: this is the welfare state drawback (Berge & McKean, 2015; Camps-Calvet et al., 2015). This phenomenon fuels the urban commons, as a replacement either bottom-up, such as in Cape Town (Colding et al., 2013), or through local politicians' initiatives, such as in Berlin after the collapse of the Berlin Wall (Colding & Barthel, 2013). Subsidiarity enables the local government to delegate some of its responsibilities to the citizens in order to provide lacking goods and services (e.g. McShane, 2010; Foster & Iaione, 2016). Opportunities also emerge from innovation and economic development, such as with the booming of information technologies through which the digital commons spreads (Rao, 2013).

3.2.2 Institutional factors

No direct institutional benefits of the urban commons were identified in our corpus. However, some factors described in Section 3.2.1 may contribute to shaping, improving or renewing institutions: e.g. empowerment, identity building and place-making.

3.2.3 Ecosystem factors

The urban commons provides major ecosystem services such as greenery-driven climate regulation [13], urban biodiversity preservation [18], soil fertility upkeep and air, water and noise pollution reduction [18] (e.g. Shah & Garg, 2017).

To sum up, in addition to nurturing community empowerment and social production, the urban commons seems to provide all the ecosystem services types identified by the Resilience Alliance report (Resilience-Alliance, 2007):

- provisioning: the urban commons provides products and goods;
- regulating and supporting: the urban commons involving greenery can regulate cities' pollution and the risk of natural hazards, and support the preservation of biodiversity and soil fertility;
- cultural: the urban commons often favours identity, cultural diversity, spirituality and recreation.

Numerous studies have mentioned that the urban commons supports resilience within urban communities [24].

3.3 CHALLENGES

3.3.1 Socio-economic factors

Political critique

A large part of our corpus contributes to the critique of neo-liberalism [55]: socio-economic mechanisms are viewed as driven by the interests of global finance capital, rather than by the interests of the society or, more generally, human rights (Harvey, 2012; Simpson, 2014). Neo-liberalism affects in many ways the urban commons (Kalb, 2017): resource enclosure [49], privatisation [49], commodification [27], gentrification (Bresnihan & Byrne, 2015; Newman, 2013), displacements [22] and alienation [21]. These serve as an argument for commoners to claim spaces in the city and reverse neo-liberalism (Hodkinson, 2012; Petrescu et al., 2016; Ruggiero & Graziano, 2018). In some cases, the enclosure or social exclusion may result from the commoning activities themselves (Cooke et al., 2019; Parker & Schmidt, 2017) to ensure their functioning.

Social tensions

A high potential for exclusion of specific users or groups of users exists [24], particularly in contexts of urban land congestion (Colding et al., 2013). The exclusion rule may originate from the commoners themselves (Cooke et al., 2019; Gilmore, 2017), the local government (Di Feliciano, 2017b, 2017a) or planners (Mundoli, Manjunatha, et al., 2017). Access to the commons needs to be restricted in order to ensure a certain quality or target usage of the commons (Webster, 2007; Williams 2018). Interests and uses of a commons may also evolve over time, eventually leading to urban redevelopments and

exclusions of past users (Nagendra & Ostrom, 2014). This occurs especially in developing countries, where traditional communities depending on natural resources for livelihood become excluded when the land is redeveloped into a recreation area, with potential pollution issues arising. It is often wealthier populations who benefit from the redevelopments at the expense of the urban poor (e.g. Baviskar, 2011). This phenomenon is one of the main arguments of the critical discourse on smart cities and, more generally, on market-driven developments: the conversion of commons spaces into private or public spaces, usually implying an ecological loss and the intervention of external funding and speculation, hinders marginalised populations and has unclear sustainability achievements (Mundoli, Unnikrishnan, et al., 2017).

However, it is also argued that no-one can be excluded from the commons, because it belongs not only to its immediate users, the commoners, but also to its potential future users; commoners become caretakers or guests of the commons (Bruun, 2015; Han & Imamura, 2015). The boundaries of the urban commons, somewhat porous, are not always as clearly defined as those from the commons described by Ostrom (Hess, 2008; Parker & Johansson, 2011; Huron, 2017; Zapata & Zapata Campos, 2019), and therefore can be contested (Bresnihan & Byrne, 2015). We come back to this point in our discussion.

Another source of social tensions, which can also lead to exclusions, is the diverse cultures existing [31] (Bogadi, 2017; Di Feliciano, 2017b) and divergent interests or views [28] (D'Souza & Nagendra, 2011; Rao, 2013), potentially causing conflicts (Gilmore, 2017; Huron, 2015). Post-socialist countries witness a double discourse about the urban commons: it is conceived either for a collective or for a more conservative use (Grabkowska, 2018).

Social tensions may also result from an uneven distribution of resources or power [20] (e.g. Batliboi et al., 2016), amplified by the issue of contested or unclear boundaries, mentioned above. Regarding institutions, the local governments are still perceived as the "ultimate sovereign" (Foster, 2011, p.113). In modern Western societies, commoning may hardly be considered as a total emancipation from authorities and market, since both state and market are strongly woven into cities (Jerram, 2015). However, control does not always come from local governments and can be exerted up to a certain extent by a minority of users, such as in club goods or private organisations (Colding et al., 2013).

Values

Values are often put forward as a challenge [33]. The social norms built by our modern society may contradict

with the values required to care for the urban commons. Primary and secondary education [3], for example, lack basic instruction about food production systems and sovereignty (Tornaghi, 2017), which could drive citizens to join community gardens. This type of education supports a socio-cultural change favourable to re-evaluate the urban commons (Grabkowska, 2018), and trigger resilience thinking (Petrescu et al. 2016).

The lack of rooting or common norms is another downforce (Gilmore, 2017; Sobol, 2017). This can originate from policies oriented towards only individual incentives (e.g. home-ownership, median income) without considering collective efficacy (O'Brien 2012). In addition, needs and norms evolve, as visible in the differentiated effects of urbanisation on urban communities (Derksen et al., 2017).

Lastly, the urban commons can lack incentives [26] to attract or maintain its community. The reasons are multiple and relate to values or to the socio-ecological context [4]: lack of experience with commonality (Huron, 2015; Rocha et al., 2016), lack of interest (Middleton & Crow, 2008; Teli et al., 2015), no individual material or ownership benefit (e.g. Grabkowska, 2018), unattractive degraded resources (Ling et al., 2014; O'Brien, 2012), lack of recognition (Correa et al., 2018; Lang, 2014) or the absence of life-threatening conditions (Petrescu et al., 2016). We could summarise these issues with: “everyone’s responsibility is no-one’s responsibility” (Blomley, 2008; McShane, 2010). Several scholars in our corpus insist on the importance of not looking at individual incentives per se, rather at their interaction with local customs and regulations (Łapniewska, 2017; Schauppenlehner-Kloyber & Penker, 2016). By doing so, they highlight a context specificity in collective-action problems (Ghorbani et al., 2013; Ostrom, 1990).

Financial viability

The urban commons suffers from financial instability [22]. Institutional protection, source of direct or indirect financial help, seldom happens (Radywyl & Bigg, 2013), either by disinterest [7] (Scharf et al., 2019) or distrust [17] (Follmann & Viehoff, 2015; Sancho, 2014) of the state towards commoning. In this case, the commons often goes underground, making it less visible to the authorities, but also to citizens. This increases the financial burden on the existing commoners, especially when land needs to be rented or purchased (Bresnihan & Byrne, 2015; Huron, 2015). While legal barriers to subsidies need more investigation (Aernouts & Ryckewaert, 2017), recent research proposes to focus more on socio-economic concerns and contradictions within the community

(Noterman, 2016), to prevent control aversion situations (Correa et al., 2018).

Knowledge

Knowledge, from science or practice, generally acts as a support of the urban commons (see subsection 3.4). However, 25 articles discuss certain issues relating to knowledge retention by private actors (Becker et al., 2015; Teli et al., 2015), by software proprietary systems (Crichton et al., 2012) or within governed/governing partnerships (Schauppenlehner-Kloyber & Penker, 2016). Beside the problem of missing data, there is a risk of knowledge bias which may threaten the understanding of the interactions between society and the governance of a given commons (Unnikrishnan et al., 2016). Urban communities may struggle with knowledge re-appropriation, for example about the personal narratives in the neighbourhood (Wise, 2013), about DIY network technology (Unteidig et al., 2017) or about urban food production systems, the knowledge of which has been externalised for a long time (Tornaghi, 2017).

A second challenge regarding knowledge is that data management may be unsatisfactory, eventually leading to non-reliable (Teli et al., 2015) or incomplete (Camps-Calvet et al., 2015) user-generated knowledge, or to a non-inclusive use of spaces, as in the case of cultural heritage sites in Cyprus (Artopoulos et al., 2019). Better designs of information flows can facilitate collective action (Łapniewska, 2017).

Communication challenges occur: e-participation can suffer from too many users or superficial interactions (Rao, 2013; Sobol, 2017), a lack of exchanges between the various actors (Durusoy & Cihanger, 2016) and the unequal access to IT resources (Batliboi et al., 2016). Communication quality also alters the image given of the urban commons to the public or to the authorities, and therefore influences their support of the initiative (Chiu & Giamarino, 2019).

3.3.2 Institutional factors

Governance

A lack of institutional support is often described (e.g., Radywyl & Bigg, 2013), through the difficulties to reach and maintain collaboration and polycentricity [34]. Several institutional challenges potentially hinder the urban commons: a weak internal structure [20] can make it more vulnerable to changes of purpose imposed by the local political context (Giannini & Pirone, 2019). This weak structure may be a choice to stay open and allow possibilities of coexistence, or “compossibilities” (Corsin Jiménez, 2014).

Oppositely, a commons can struggle with rigid institutions [16]: these persist over time not taking into account

circumstances which could, otherwise, make the commons more adaptive. This occurs through static urban design or bureaucratic stalling (e.g., Arora, 2015; Chatterton, 2016). Institutions may also be flagged as non-effective [15]: young and weak democratic structures (e.g., Grabkowska, 2018), improper implementation of governmental protection plans (Mundoli, Manjunatha, et al., 2017) or of property rights (Ling et al., 2014) and the incapacity to prevent speculative real estate in case of city bankruptcy (Goldman, 2015; Safransky, 2017). In the case of Central Park in New York, a badly managed public space leads to the formation of safe “socio-spatial bubbles” intended for the elite and bourgeoisie (Sevilla-Buitrago, 2014). The last two institutional issues are over-regulation [6], for example through monopolies (Webster, 2007), and fragmented institutions (e.g. Nagendra & Ostrom, 2014). Ironically, giving people roles disempowers them (Radywyl & Bigg, 2013): instead of taking direct action, they tend to only make decisions. A hierarchical division of responsibilities may lead to ignore the potential of citizens (Schauppenlehner-Kloyber & Penker, 2016). An excessive enforcement of cultural and institutional conventions, including public order and safety, may result in the formation of “atmospheric walls” which segregate the population, thereby diminishing the commoning possibilities (Borch & Kornberger, 2015).

Finding the appropriate level of autonomy [19] regarding the local authorities represents another difficulty: while some initiatives struggle to secure formal recognition [26] (e.g. Scharf et al., 2019), others enjoy a fruitful partnership with local authorities, which could turn into exacerbated inequalities (Unnikrishnan et al., 2016) or co-optation by the state (e.g. Cooke et al., 2019). In the latter case, the project is integrated in the agenda of a political party or of an NGO at the cost of its autonomy (Pithouse, 2014). A major form of control exerted over commoning practices is the granting of short-term land leases rather than ownership for the group of commoners (Bunce, 2016; Camps-Calvet et al., 2015). Such partnerships could restrict the freedom of action only to what benefits the government (Bresnihan & Byrne, 2015), meaning a partial or total loss of autonomy (Łapniewska, 2017).

Commoning practices often lack the authority to enforce their internal rules, such as sanctioning which may happen through municipal enforcement only (Schauppenlehner-Kloyber & Penker, 2016). This points to the issue of accountability [11]: commoners lack the institutional legal support which could help them make better decisions and ensure a good use of the resources. The issue closely relates to legitimacy. However, according to several commons critical thinkers, the creation of proper commons strongly relies on the involvement of the state (Cumbers, 2012; Harvey, 2012; Kalb, 2017).

A commons also undergoes external pressures. A government may act distrustfully towards individuals, for example through controlling a part of a city’s population by inhibiting popular uses of space [17]. In a post 9/11 world, States tend to tolerate fewer groups that act collectively outside known institutional frameworks (Susser, 2017b). Sanitary reasons may also be evoked as a reason to hinder commoning (Gillespie, 2016; Vrasti & Dayal, 2016), as we have witnessed during the 2020 pandemic. The inhibition is performed through institutions such as “vigilante” monitoring in Paris (Newman, 2013), police patrolling (e.g., Sevilla-Buitrago, 2014), evictions of squatters (Di Felicianantonio, 2017a), stalled procedures for stigmatised populations (Aernouts & Ryckewaert, 2017) and internet surveillance (Rao, 2013).

Land availability and accessibility

In a dense urban habitat, there is usually limited land availability [21]. High development pressure [20] drives challenges such as the commodification of space, strict definition of property and competition with financial activities. Urban commons may even threaten each other (Huron, 2015; Petrescu et al., 2016). The commons is often considered as “res nullius”, which is the open-access property regime, as much unassigned as any other form of wasteland. Local governments may use this argument to appropriate these lands (Mukherjee & Chakraborty, 2016). 37 studies mention struggles with property rights, one of which is access: social reproduction, for example with urban agriculture, requires access to resources such as water, waste and sewage (Tornaghi, 2017). The management of these property rights affects the commons, for example through street use regulation (Jain & Moraglio, 2014; Young, 2014), and may drive exclusionary regimes (Colding et al., 2013; Garnett, 2012; Nagendra & Ostrom, 2014). For these reasons, it is often proposed to restructure the property rights in place (Blomley, 2008; Safransky, 2017).

Scale

Scale is the last significant institutional challenge, expressed through the problems of size [8]. Larger groups may be chaotic and smaller groups, although more convivial (Parker & Schmidt, 2017), can have an insufficient number of actors for effective stewardship of the commons (Nagendra & Ostrom, 2014). Scaling-up requires additional levels of bureaucracy, which can fence off most initiatives (Pithouse, 2014; Radywyl & Bigg, 2013).

3.3.3 Ecosystem factors

The urban commons faces urbanisation [25], i.e. the expansion and densification of the urban territory (Shah & Garg, 2017). Densification (Webster, 2007) and resource

over-consumption [14] are the two major identified tragedies of the urban commons. They can be linked to the weak management of spaces by the authorities, also called regulatory slippage [7] (Foster, 2011). Urbanisation also has consequences in terms of land use change, degradation or pollution and encroachment (e.g. Derkzen et al., 2017). In India, unplanned urbanisation may irreversibly destroy peri-urban natural areas (Mukherjee & Chakraborty, 2016; Mundoli et al., 2015; Rao, 2013). In other cases, speculation and short-term individual gains exert pressure on urban land (e.g. Huron, 2015): in smart cities, the commons tends to be converted into public or private goods under a technocratic use of the term resilience, in a more corporation-driven and capitalist perspective (e.g., Petrescu et al., 2016; Teli et al., 2015). Newer land uses, turned towards recreation, Special Economic Zones or renewed transport infrastructure, also diminish the urban commons (Goldman, 2015; Rao, 2013; Unnikrishnan et al., 2016). A general consequence of urbanisation is pollution, which for example in India directly affects the urban green commons (Nagendra & Ostrom, 2014). Urbanisation is also a driver of space saturation which causes competition, harmful to the urban commons (Di Felicianantonio, 2017b; Huron, 2015).

Regarding the biodiversity discourse, one study questioned the adequation of urban vegetation and legal zoning: plant mobility indeed crosses the existing parcels boundaries (Cooke et al., 2019), which may require additional framing of the urban green commons.

3.4 SUPPORTING THE URBAN COMMONS

3.4.1 Socio-economic factors

Socio-cultural background

Opportunities span across several aspects: civic and well-being concerns [25], shared norms [22], a pre-existing street culture [15], existing links and proximity [14] and diversity [9]. A public democratic culture supports the urban commons (Arora, 2015; Wise, 2013). The most relevant discourse is the call for urban justice, for the right to the city or an overall tradition of organised opposition through practices of activism [14] (e.g., Becker et al., 2017). Indignados and Occupy discourse have helped to produce a commoning consciousness (Susser, 2017b), leading to shared norms, which result in collective efficacy (O'Brien, 2012): culture industries and artistic neighbourhoods are the drivers of urban regeneration (Frenzel & Beverungen, 2015; Vrasti & Dayal, 2016). Traditions of collective care or collective attachment to a place are an example (e.g., Datta, 2013; Derkzen et al., 2017). Finally, a diversity in community members, expressed for example through an explicit anti racial-focused or immigrant-opposed

discourse, provides a fertile ground to commoning (Colding & Barthel, 2013; Susser, 2017a).

Media technologies

Media coverage provides a strong communicative and organisational support [19], both offline and online. Digital technologies may be used to engage a community around an issue [22], such as public transportation, education or activism (Crichton et al., 2012; Crow et al., 2008; Rao, 2013; Teli et al., 2015).

Expert and peer-produced knowledge

Knowledge strongly supports commoning [22]. Two types exist in our corpus: expert knowledge [20] and knowledge generated through commoning [27]. High-quality data helps to formulate adequate and relevant policies (Shah & Garg, 2017), to ensure evaluation and monitoring (Ni'mah & Lenonb, 2017) or to help kick-start or manage an urban commons initiative (Gilmore, 2017; Lang, 2014; Łapniewska, 2017; Petrescu et al., 2016). Knowledge can also be co-generated through and for community engagement (Aernouts & Ryckewaert, 2017). Social learning, experimentation and knowledge transfers are expected to help achieve resilience (Chatterton, 2016; Schauppenlehner-Kloyber & Penker, 2016), such as through mutual exchange with other initiatives, which helps building adaptive capacity. Overall, more knowledge about the urban commons increases potential participation and social resilience (Mundoli, Manjunatha, et al., 2017; Shah & Garg, 2017).

3.4.2 Institutional factors

Institutional support comes directly (aimed at a specific commoning initiative) or indirectly (as part of a larger discourse or set of policies).

Direct support

It may originate from social organisations (Di Felicianantonio, 2017a), local governments (e.g., participatory budgeting in Poland (Grabkowska, 2018; Łapniewska, 2017) and in Brazil (McFarlane, 2011)) or from the public through petitions (Follmann & Viehoff, 2015) and donations (Giannini & Pirone, 2019). The formal recognition of the commons directly leads to financial support [15] or logistic help [28], such as providing spaces or initiating the design phase. In Quebec, a street Wi-Fi network has been approved as a bottom-up urban commons precisely because the municipality failed in setting partnerships with private telecommunication companies (Middleton & Crow, 2008). In the case of housing, direct support is needed for the provision of decent housing

for low-income people (Huron, 2018). In São Paulo, Brazil, part of this housing is organised by the housing movements or co-op organisations. However, property remains the keyword when it comes to housing access (D'Ottaviano, 2018).

Laws and treaties

The environmental discourse [13] is a good example of indirect support; the related legislation concerns issues of soil and water remediation, biodiversity, greening the city or renewable energy which also affect urban land. Germany's Renewable Energy Sources Act from 2014 (Deutsches Bundesministerium für Wirtschaft und Energie, 2014) promotes decentralised energy systems, of which citizen initiatives in Berlin and Hamburg have benefited (Becker et al., 2017). In India, the Smart Cities Mission, launched in 2015, has among its objectives to ensure a clean and sustainable environment (Mundoli, Unnikrishnan, et al., 2017). However, in some cases, these treaties lead to resource access restrictions, negatively impacting the lives of nearby communities: the Ramsar intergovernmental treaty for wetland protection is one of them (Derksen et al., 2017).

Polycentricity

A multiplicity of actors [25], often shaped into a decentralised governance system, can drive adaptive capacity (Becker et al., 2017; Gilmore, 2017; Mundoli, Manjunatha, et al., 2017). Typical actors are the local government, social organisations, NGOs, knowledge or design experts, cultural partners, companies and of course citizens (Aernouts & Ryckewaert, 2017; Batliboi et al., 2016; Nagendra & Ostrom, 2014; Ni'mah & Lenonb, 2017; Rocha et al., 2016). A close interaction between a community and its local government is generally observed as beneficial [19]: it generates urban rejuvenation programs (D'Souza & Nagendra, 2011), fosters tactical urbanism solutions (Batliboi et al., 2016; Radywyl & Bigg, 2013) or participatory budgeting (Grabkowska, 2018; Łapniewska, 2017), offers autonomy and legal protection to commoners (e.g., Aernouts & Ryckewaert, 2017; Schauppenlehner-Kloyber & Penker, 2016) and helps ensure continuity (Rocha et al., 2016).

3.4.3 Ecosystem factors

The global environmental discourse, including ecosystem issues, drives certain policies supporting the urban commons at multiple levels: international to municipal. We have described them together with the institutional factors in subsection 3.4.2.

4 DISCUSSION

We have found a high variety of urban commons types in our literature body of 167 papers. The context of the urban commons greatly matters when referring to benefits, challenges or supports (Vitale, 2010): a geographical focus, a local or national institutional focus, or a socio-economic focus can help understand why commoning happens and along which dynamics. We have seen examples of contestation movements, claims to social or environmental objectives but also of urban poor relying on the commons for their livelihood.

Unlike in the traditional commons literature, boundaries are not always clear in cities (Zapata & Zapata Campos, 2019): “[m]aybe this is what is urban about the urban commons: this attention to the needs of as-yet-unknown members, and a willingness to keep boundaries somewhat porous” (Huron, 2017, p.1065). Urban commons initiatives are not bound to physical or digital infrastructures. What makes them new commons is not the physical infrastructure, the floor, the walls, the shops or any other visible amenity that may become a “collective good”, but the atmospheres created by users passing by or gathering: a transit space created by informal socializing (Löfgren, 2015). This is in line with the idea of a city as assemblage, a collective composition (McFarlane, 2011). We highlight the need to rethink what commons means in the urban context, because of urban complexity and many existing informal arrangements. “[T]hicker, more ethnographic accounts of the commons” (Blomley, 2008, p.320) are needed. By using Hess' frame of non-traditional Common-Pool Resources, or new commons, we embraced a significant part of this diversity in our review.

Commoning practices embody the dynamics of the urban commons which currently lack in Hess's classification. Through such practices, more cases are perpetuated and therefore, more knowledge is generated. Commoning covers other types of communalities such as streets and transit places (Löfgren, 2015) which become urban commons through action (Bruun, 2015; Harvey, 2012).

In the philosophy of Lefebvre (1968, 1974), the city represents a social space, in the sense of a complex social construction (Smith, 1998; Huron 2015). How space is used (or *socially produced*, in Lefebvre's terms) through practices, matters more than space itself, thus “redefining identity and collective strategies” (Le Galès, 1998, 502). Urban space thus becomes the output of shared visions of the world (Moss, 2014), and offers good opportunities for the commons (Harvey, 2012; Huron, 2015). In this perspective, the urban space should remain accessible, for example through the idea of “social function of property”

(Foster & Iaione, 2016, 307-308), in which a State grants private ownership but with an obligation to guarantee its social function. When the urban space is no longer accessible (Sassen, 2015), it becomes the object of claims. All publications from our literature review brought valuable input to this assumption, and property rights are seen as a major challenge. Under various neo-liberal threats, market-driven, urbanisation-driven or both, Lefebvre's idea of "right to the city" resonates through the urban commons.

4.1 CRITICAL POINTS IN THE LITERATURE CORPUS

Two points stood out in our corpus. The first one is knowledge. While expert-generated or peer-produced knowledge is generally considered a support to the commons, multiple studies warn about the quality, extensiveness and management of this knowledge. In addition, learning driven by commoning may trigger adaptive capacity of the involved communities, but education is sometimes subject to cultural norms, which may retain the social resilience potential (Grabkowska, 2018; Tornaghi, 2017).

The second point is governance. Commoning initiatives propose an alternative governance approach, independent from conventional urban planning, which brings issues of legitimacy and accountability. Maintaining the initiative's activity over time may require various forms of institutional support, which raises concerns on their autonomy, on their trust relationship with local authorities, on the effectiveness of such partnerships and on the unequal access to formal help (Bianchi, 2018; Foster & Iaione, 2016; Giannini & Pirone, 2019). Democracy in such institutional arrangements is still debated. Another issue is the internal management structure of urban commons initiatives. It may be unstructured to favour openness to change and to possibilities, but this also makes these initiatives more vulnerable (to forced changes). Nonetheless, a solid structure with too rigid institutions hinders the capacity to adapt, as illustrated by formal roles given to participants, which eventually disempower them by locking them in non-productive decision-making processes (Radywyl & Bigg, 2013).

We, therefore, introduce the following paradox: on the one side, commoning is perceived as a claim to certain civic rights and expression of a collective identity. On the other side, multiple studies have revealed the need for an overarching authority, for formalisation or support. This paradox is embodied by the duality of the social contract as described by Jean-Jacques Rousseau (1762). In his view, people form a community to overcome certain obstacles. To do so, they make a "social pact" consisting in alienating one's natural rights in favour of the sovereign society and an associative pact to form a cohesive society. Every member

of this society is then both a citizen, as a participant to the sovereign authority, and a subject to its laws. In Western societies, commoning can hardly function without the coordination of a governmental authority, because state and market are strongly present in the functioning of Western cities (Jerram, 2015).

Cities' values of production and capitalisation often oppose commoning logic. A third of our corpus explicitly positions neo-liberal agendas as a "productive threat" to the commons: urban dwellers engage in commoning as a result of services, spaces and in general means of social reproduction which are not provided by the state, because of their pursuit of private interests.

4.2 LIMITS IN OUR APPROACH

We used the broad new commons map of Hess (2008) to select papers for our literature review. Yet, corpus boundary has remained an issue: until what point can we talk about an urban commons? Are municipality-initiated active citizenship projects part of them? Does peri-urban farming count?

We have outlined the importance of the commons for such communities, which gives relevant insight to the commoning practice (Bruun, 2015). Co-production is an alternative framework of study for the urban infrastructure provision (Becker et al., 2017). However, we have not looked at the urban commons from a circular economy or co-production perspective in this study. Interesting results may come from such analysis with a different focus: given the variety of fields talking about the commons (*Figure 2*), there are potentially strong and diverse contribution opportunities.

4.3 DIRECTIONS FOR FUTURE RESEARCH

We have uncovered several blind spots within the urban commons field. In line with Huron (2015), we emphasize here the lack of theorising on the urban commons, particularly the urban part of it.

In the urban context, we still lack knowledge on the level of democracy of institutional linkages between the different commoning actors and the stakeholders, along with their underlying motivations and interests. Legal barriers also need more investigation. We lack an overview on the role of equity-oriented decision-making processes, such as sociocracy, in commoning. The *Théorie des Cités* (Boltanski and Thévenot, 1991) and its regimes of justification, or shared visions of the world, could bring certain answers regarding institutions and interactions within co-construction processes. This theory has been connected to the concept of communities of practice (Wenger, 1999; Bussels et al., 2016), but lacks at the moment empirical applications.

Given the urban complexity and its multiple overlapping realms of values, we doubt that empirical studies alone provide sufficient knowledge in order to formulate applicable guidelines and recommendations. The field of computational social sciences is growing and may significantly contribute to this. Agent-based modelling is a type of computational model which allows the exploration of complex systems such as governance schemes or behavioural dynamics, with unlimited varying conditions and parameters (Ghorbani & Bravo, 2016; Janssen & Ostrom, 2006). We have for example applied agent-based modelling to study behavioural and institutional mechanisms in urban community gardens and cooperatives (Feinberg et al., 2020; Feinberg et al., 2020).

Finally, after having introduced the main property regimes in section 1.3, it turns out, through many examples, that the conditions of use and access are more relevant than the question of ownership. Analysing these conditions with respect to the urban commons, in a context of unclear public space definition, seems to be a priority.

5 CONCLUSION

We aimed to build foundations on which future research and future planning guidelines and policy recommendations could be formulated regarding the urban commons. Through our straightforward analytical structure of benefits/challenges/supports, we made our analysis as practical as possible: usable both for researchers and practitioners.

The urban commons spans widely from tangible to less tangible resources, well-described by Hess' map of the new commons. The diversity also extends to its associated bundles of rights: from open-access to private property-rights regimes.

The urban commons is not a new phenomenon after all. It is a transposition of an old tradition of commoning, usually on agricultural and natural land, to urban systems: this can be a necessity for displaced populations due to urbanisation, a way to socialise in neighbourhoods, generate urban goods and services or finally, make a political claim. This transposition is however not straightforward and justifies the distinction between traditional commons and new commons.

Several factors initially thought of as threats to the urban commons become opportunities or reasons to reinforce or reproduce the urban commons. Privatisations, resource enclosures, urbanisation, authoritarian regimes, weak welfare state: all these drive people to engage into commoning and claim the rights and freedom which otherwise would be destroyed. By providing major ecosystem services, the urban commons is indeed a major

contributor for livelihood in developing countries: it provides goods and services necessary for the urban poor to survive in growing cities, it helps shape a collective identity and values beyond multicultural issues, it generates local value through products, jobs or geographical added-value, and it helps maintain important ecological services. Last but not least, through the collective identity and values, adaptive capacity and capacity building within most initiatives, the urban commons has the potential to trigger social resilience to better face societal and environmental crises. The diversity of views and interests may also, under certain conditions, drive social resilience. A precondition to that is knowledge about the urban commons, itself becoming a commons, which increases potential participation in these initiatives.

However, the urban commons still struggles with land access, exclusion of specific users, a lack of formal recognition, autonomy and rigid institutions. This hinders an urban commons initiative's potential to trigger social resilience and to survive over time. A failing urban commons initiative is like a living organism's cell dying; its death does not affect the overall tissue or organism. Cells are renewed constantly to ensure a functioning tissue. The renewal of urban commons initiatives is the key to their survival.

Our urban commons analytical framework, as proposed in [Table 1](#), is a summary of the existing results about the urban commons from an ecosystem, socio-economic and institutional perspective. Further research could use this structure to evaluate the potential of the urban commons for adaptive cities and communities. In addition, the benefits/challenges/supports scheme offers practical applications for potential research and field use. The institutional axis remains to be further investigated, for example through social simulations of the context-dependence and behavioural mechanisms in the commons.

Further research in the field of the commons could benefit from the assemblage approach, originally proposed by Deleuze and Guattari in 1980. For example, to gather knowledge, or as a foundation to study behavioural, political or economic dynamics, happening within commons examples, each of which can be seen as a component of the commons assemblage.

ADDITIONAL FILES

The additional files for this article can be found as follows:

- **Appendix 1.** Initial corpus on the urban commons. DOI: <https://doi.org/10.5334/ijc.1033.s1>
- **Appendix 2.** Urban commons types according to Hess (2008) in our bibliography. DOI: <https://doi.org/10.5334/ijc.1033.s2>

- **Appendix 3.** Detailed benefits, challenges and supports for each initial corpus item. DOI: <https://doi.org/10.5334/ijc.1033.s3>

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COMPETING INTERESTS

The authors have no competing interests to declare.

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