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“The ‘commoners’ of the past are the ‘stakeholders’
of the present and future” (Bonnie J. McCay 2000).

1.1 Introduction

Half of the world’s population today lives in urban areas, a proportion expected to increase to 2/3 within 50 years. With a greater proportion of humans living in metropolitan areas¹, urban ecosystems will experience increased land-use and land-cover change, including the loss of ecosystems and their associated services, such as the provisioning of habitat for species. Currently, urbanization endangers more species and is more geographically ubiquitous than any other human activity, with urban sprawl rapidly transforming critical habitats of global value such as the Atlantic Forest Region of Brazil, the Cape of South Africa and coastal Central America (Elmqvist et al. in press). Urbanization not only leads to increased homogenization of fauna and flora (McKinney 2002) but also to impoverished biological metropolitan areas, arguably serving as a constant reminder of the presumed unimportance of biodiversity which may contribute to ‘environmental generational amnesia’ among the greater public (Miller 2005).

To gain the much needed, broad-based public support for a sustainable use of ecosystems, inside and outside cities, the places where people live and work need to offer opportunities for meaningful interactions with functioning ecosystems (Miller 2005; Rosenzweig 2003; Andersson et al. in press). In this respect and in order to help mitigate the growing disconnection of urban residents from nature (Pyle 1978, 1993), property right dynamics determining human relationships to land can have powerful ramifications worthy of scholarly analyses by providing propositions about the manner in which land ownership in cities evolves (Webster 2003), and the potential outcomes hereof such as the provisioning of critical ecosystem services necessary for human well-being (MA 2005; Daily 1997). It is increasingly recognized that today's institutions poorly match current changes in ecosystems and their dynamics (MA 2005; Folke et al. in press).

In this chapter I argue that urbanization results in an increasing proportion of people becoming landless. Two critical outcomes result from this: First, ecological illiteracy among people run the risk to increase as a consequence of that direct human forms of interaction with land diminishes. Second, prospects for ecosystem management, which depends on local stakeholder involvement, become further limited in urban areas.

As outlined here the dynamics of property rights act as one of the most prominent causes behind the observed pattern of ecosystem (or, green-area) loss in urban areas. Urbanization in market-driven, industrialized countries inevitably leads to scarcity of land accompanied by a rise in land prices and the increasing subdivision of land that favours the growth of private land ownership (e.g. club goods). The current shift to private organisations for providing and managing urban services is so pervasive that some property rights scholars regard it is a global phenomena, independent of a

country's wealth or political ideology (Webster 2003; Lee and Webster 2006). As a result lands held in the public domain increasingly become privately enclosed, and often turned into urban development, further reducing opportunities for the greater majority of urban residents to have meaningful interaction with urban ecosystems.

While it may make economic sense for governments to sell public land to private actors, this change may not always provide desirable socio-environmental outcomes in cities. In this context, I bring forward the notion that common property-rights regimes offer important institutional arrangements for providing a range of ecosystem services in urban settings, as well as for promoting ecological literacy and environmental stewardship among urban citizens. Both considerations represent critical tools for tackling the increasing challenges associated with environmental change and the loss of biodiversity and ecosystem services. In common property-rights regimes, management rights to natural resources are in the hands of an identifiable community or group of users that may craft their own institutions for management of their resources within given legislative forms of society (Berkes and Folke 1998; Berkes et al. 2003).

The chapter is organized as follows: Part 2 begins by providing some general land characteristics of urban settings. In part 3 I describe how the dynamics of property rights provide a powerful explanatory theory behind much of the land development patterns occurring in urban areas, of which green area loss often is an inevitable outcome. The theoretical underpinnings for this argument is largely based on the work by Webster and colleagues (Webster 2002; Webster 2003; Lee and Webster 2006). Part 4 deals with examples of 'urban commons' from various parts of the world, based on a literature inventory. Examples cover community gardens in the U.S., allotment areas in Europe, and some recently emerging forms of collectively managed

lands. In part 5 I suggest ways in which urban commons could contribute to the sustainability making of metropolitan areas including promoting ecosystem services, and discuss their applicability in urban ecosystem management. The chapter ends by a summary of the broader insights generated in this essay.

2. Urban land characteristics and implications for land interaction

While quantified data on urban land cover do not always come readily to hand, a key characteristic of urban land is that it comprises built-up patches to a greater extent than any other landscape type. This proportion differs, of course, among cities, with the size of cities, and depending on where along rural-urban continuums analyses are made. For example, in a land-use survey of Leicester residential and commercial areas accounted for 65% of the land cover (Carr and Lane 1993). In Brussels about 50% of the land area consists of built-up lands (Gryseels 1995). In the heart of London open spaces only make up some 7,5% of the urban landscape, of which nearly half is regarded as 'green' (Plummer and Shewan 1992). In Berlin vegetation cover ranges from 32% in the built-up areas of the city to 95% in the outer suburbs (Sukopp et al. 1979). Often, however, the actual coverage of urban green space is considerably greater than what official estimates suggest when semi-natural lands are taken into account (Kendle and Forbes 1997). For example, private gardens in residential areas in and around Stockholm city cover over 16% of the total land area, but are officially registered as built-up land in land classification statistics (Colding et al. 2006).

Ownership to land in city-regions also differs markedly from ownership patterns of other landscape types. As one moves from the rural settings towards metropolitan areas, and especially urban core areas, an increasing proportion of people become landless due to that they live in multi-family dwellings without associated land

(**Figure 1**). At this scale green spaces tend to be owned by state authorities such as a local municipality or by powerful private organizations. Examples include public parks, churchyards, street alleys, and various types of green space associated with large organizations such as schools, hospitals and industrial parks (Kendle and Forbes, 1997). As one proceeds outward from the city-center, suburban green patches cover quite extensive and cohesive chunks of the metropolitan green space with a progressively increasing amount of green areas located in the semi-rural urban fringe (Colding et al. 2006). With this outward progression also often follows an increase in the proportion of per capita ownership to land. For example, at some 5 to 7 km from the center of Stockholm city, the proportion of persons living in one- and two-dwelling buildings with domestic gardens increases quite substantially.² With ownership of land also follows different bundles of property rights (Ostrom and Schlager 1996), of which rights of access, withdrawal, management, exclusion, and alienation are the most prominent (**Table 1**). While green spaces in urban cores for most part allow for public access³, not all do. For instance, over a third of the open land in the more central parts of London is closed to public access (Plummer and Shewan 1992). While public green spaces may exist in densely populated neighbourhoods with multi-family dwellings, residents are often denied both withdrawal rights and management rights to these lands. Hence, much of the urban population is removed from the opportunity to own land, to have an input into the use of urban land, and arguably, the ability to understand or have concern for land conservation outside and inside cities (Rhode and Kendle 1997). Instead most bundles of property rights associated with green space tend to be vested in governmental authorities, such as some traditional local authority maintenance staff or private contractors that favour simple, structurally monotonous land use designs with large

tracts of uniform grass with or without planted trees ('pet' tress) which can be characterized as 'green deserts' (Kendle and Forbes 1997). Emphasize in such management is on aesthetic ideals ('clean and tidy') rather than ecological ones (Colding 2007).

3. 1 Dynamics of property rights and the transformation of urban land

Descriptive accounts of urban areas seldom consider the dynamics of property rights as an explainable factor behind land transformation and green area loss in growing metropolitan regions. It has, however, been proposed that the same mechanisms that were in operation behind the transformation of common land in Great Britain also pertain to the land development pattern observed in many city-regions in market-driven, industrialized countries. This ultimately plays out as a game of property rights change. In rural Britain, a substantial amount of common land rights were formally in existence until the 16th century when a historical change in the agricultural land value occurred as the demand for wool and clothes quickly rose and sheep farming became the most profitable form of agriculture (Lee and Webster 2006). With the rising value of land driven first by national and then international trade, common land became increasingly scarcer with private property rights increasingly prevailing throughout England and Wales (Lee and Webster 2006). This was driven by technological and economic development, which lead to a significant change in the yield of land.⁴

Central in this economic property right argument is that as the value of land increases; there is an inescapable secular trend towards the subdivision of property rights, with common rights giving way to private rights (Barzel 1997; Lee and Webster 2006) with a further likelihood of subdivision proceeding within an organized system of exchange (North 1990). Clearer boundaries (read privatization)

make for more efficient exchange, equating to a lowering of *transaction costs* – or the costs of creating and policing contracts that establish ownership over a commodity (e.g. land) (Webster 2002). A fundamental proposition behind the property-right argument made by Lee and Webster (2006:31) is that “the more accessible land is, the more scarce it is and central, land becomes increasingly scarce as city grows”. They use the growth of Manhattan as an illustrative example:

“Prior to the Dogan Charter of 1686 which conferred on the municipality ownership of all land in Manhattan, no land was granted or sold to individuals. Under municipal ownership, however, land became the ultimate source of funds required to manage the municipality and to maintain its famous low taxes. Parcels of common land, whose boundaries were still irregular, were sold to individuals during this period. By the last quarter of the 19th century, private ownership had become prevalent in parts of the island [...]” .

Privatization of land still helps push New York’s economy. Today, more housing units are being built in New York City than in any time since the height of the post-World War II boom in the early 1950s with large sections of the former industrial waterfront in Brooklyn and Queens being rezoned for residential development (Solecki and Leichenko 2006).

Urban spatial order can also emerge spontaneously without explicitly planned government control over land use (as was the case in Manhattan), through numerous bilateral exchanges in the marketplace. Lee and Webster (2006) use the subdivision in the suburbs of Bangkok, Thailand, as an instructive example where

urban transformation began with squatters occupying the narrow strips between rice paddies and canals:

“As the value of agricultural land increased with the size and wealth of the urban population, rice paddies were subdivided into higher vegetable gardens. At some stage the value of land increased to the point where land was sold to developers who turned strips of paddy land into housing estates. As the value of land continued to rise, further subdivision progressed through densification and by further spatial subdivision and by building upwards” (32).

Certain dimensions to public domains are particularly important for understanding the enclosure of cities and which affect the stability of a public domain space (land)⁵ (Lee and Webster 2006). One is ‘congestion’, referring to the degree of competition within a public domain, or “the numbers of individuals who jointly consume it, and the range of tastes amongst those individuals (or groups)” (ibid: 34). When congestion generates excessive costs⁶ then there is likely to be pressure to reform property rights and subdivide the public domain either into private domains or smaller public domains (e.g. club goods). When public domains become congested, they need governing in such a way that use rights become clear and enforceable; however, to design, create and administer such a system of rights (i.e. transaction costs) is a costly business, and if costs for establishing such rights are politically or financially too high, “then the public domain remains contested and unsubdivided and effectively becomes unsustainable” (ibid: 36).

Another dimension is ‘separation of attributes’ which is likely to be established if it is cost effective and a sufficient demand exists for this. For example, the rights

regarding the different attributes of a lake can be separated and allocated to various groups of consumers such as recreational space for wind surfers, habitat for fish, swimming areas, etc. In a congested public domain, markets and governments will strive towards a separation of these rights according to different attributes (Lee and Webster 2006). A telling example of the separation of attributes happen to some public green spaces as a consequence of increasing financial costs on behalf of maintenance for local governments. In Stockholm city, for example, there are several instances of public parks that have degraded due to underfunding. In conjunction with restoration of these parks, local government agencies open up for several types of private establishments, such as cafés, amusement areas, etc. While income from rents and property taxes make park restoration and management feasible, this occurs at the expense of transforming patches of green space into built-up areas.

As a result of excessive costs related to congestion and maintenance of public domain space⁷ there has been a rapid emergence of club-based organization of such land. Examples include the rise of privately governed ‘common-interest housing developments’ (CIDs), including gated communities⁸, townhouse and condominium projects, and other planned communities (McKenzie 2003). In the U.S. this massive privatization of local government functions constitute over 230,000 housing developments containing about 47 million people, or one-sixth of the U.S. population (c.f. McKenzie 2003). It has been argued that this world-wide trend towards ‘club goods’ (Buchanan 1965) can be explained by the emergence of property rights that more effectively deal with the problems related to increasing transaction costs associated with public domains (Lee and Webster 2006). Club-based organization of public land may also include whole miniature cities with

securities, financial, and business headquarters (Lee and Webster 2006). The shift towards privatization in urban areas not only pertains to land ownership but also to the provisioning and management of urban infrastructure and other services in cities (Lee and Webster 2006).

4. Urban commons

Research show that active land management can contribute to promote understanding about the feedback links between ecosystems and people by increasing environmental knowledge among urban populations where such knowledge tends to be low (Theodori et al. 1998; McDaniel and Alley 2005; McKinney, 2002). Kaplan and Kaplan (1989) even argue that people who do not experience nature early and regularly are less likely to develop strong emotional ties that motivate costly conservation efforts in society. Hence, reconnecting (or, reconciling) humans to nature in urban areas is critical if future generations are to have the necessary knowledge, attitudes and skills to make decisions that take the natural environment into account (Palmer et al. 2005).

Several different types of reconciliation approaches to nature have been suggested in recent years (Colding et al. 2006; Rosensweig 2003; McDaniel and Alley 2005), including urban designs and adaptive co-management approaches (Colding 2007). However, little tinkering has been devoted to how lands managed as commons could contribute to mitigate ecological illiteracy in urban settings by promoting land management approaches and by promoting ecosystem services.⁹

In the following I provide some examples of what I here refer to as urban commons in the sense that users hold all bundles of property rights to these lands with the exception of ownership rights. Hence, these common property systems for most

part represent systems where users are proprietors (see Table 1). Examples dealt with include community gardens in the U.S., allotment areas in Europe, and some recently emerging forms of collectively managed lands. This is followed by a discussion of how urban commons provide ecosystem services and how they more broadly could be designed to promote ecosystem management approaches in urban areas.

4.2. Community gardens

In 1998 some 23% of all land in the cities of U.S. was classified as vacant (Bowman and Pagano 1998).¹⁰ Many neighborhood communities transform these urban spaces into ‘community gardens’, which represent publicly or privately held lots which residents do not own but grow food, flowers, or greenery on (Schukoske 2000). Community gardens have been described as “neighborhood commons” (Linn 1999) that build social capital by encouraging neighbors to work together and socialize, providing opportunity for residents to “bond” with others of their own group, but also to serve as a “bridge” among diverse groups (Shinew et al. 2004). As of 1994, some 300.000 households in the U.S. conducted community gardening (Linn 1999).

Community gardening is a grass root movement that depends upon collaborative efforts of diverse residents to succeed (Shinew et al. 2004).¹¹ In community gardening people work together on a vacant lot, usually located in the downtown of a city or in a low-density suburban area (Janson Waddick 2000).¹² The vacant-lot gardens are usually small, such as in New York City where gardens constitute 5-by-15 meter lots (Schmelzkopf 1996). If residents want to lease city-owned property, they need to organize an association, clear up the lot, bring in soil and negotiate for gardening supplies as well as take certain requisite workshops before actual management takes place (Schmelzkopf 1996).¹³

From a property-rights perspective community gardens, at least in the U.S., represent an extremely unstable type of property right domain, usually representing an interim use for vacant land awaiting construction. In fact, less than 2% of the community gardens are permanent in the U.S. (Linn 1999). In some city-jurisdictions where publicly owned vacant lands are used for gardening, the duration of garden lot leases is specified in authorizing laws. These durations may range from as long as five years (renewable) in Seattle, to two years in Boston, and as short as one growing season under New York Law (Schukoske 2000). Interestingly, lot lease durations closely correlate with the appearance of gardens, with gardens having long-term leases demonstrating a sense of permanency with an abundance of slow-growing trees, perennials, lawns and features such as benches, gazebos, and brick paths (Schmelzkopf 1995). Hence, as property rights theory would predict, community residents are more willing to invest in gardening activities the longer the leases they have.¹⁴

Of key importance for securing land for community gardens has been the formation of the Metropolitan gardening organizations, or MGOs, that support thousands of gardens in the United States (Janson Waddick 2000).¹⁵ In addition, the Trust for Public Land also secures public land for community gardens, and helps community organizations establish themselves legally as non-profit organizations to purchase and administer open space for gardens (Linn 1999). Also, public agencies and private non-profit corporations, e.g. public housing authorities, public schools, churches, and settlement houses have made land available for community gardens by their own constituencies (Linn 1999). Another way of securing land for community gardens is through their incorporation in the comprehensive planning process. For example, the city of Seattle, Washington, was first in the U.S. to include community

gardens in its comprehensive plan, aspiring to have a community garden within walking distance of every 2,500 residents and with a performance measurement for community gardens (Janson Waddick 2000).

4.3. Allotment areas

A considerably more stable form of common-property rights regime in urban areas is allotment gardens. An allotment area can be defined as an area with tiny pieces of garden plots with individual or family management rights to land, usually owned by a local municipality and located in urban or semi-urban areas, usually on prime, fertile soils¹⁶ (Colding et al. 2006). These areas may differ quite widely in size; e.g. in the Stockholm metropolitan area they range between 3450 m²-70,000 m² (Andersson et al. in press). Allotment areas represent well-demarcated, green lush areas that often are considerable old (sometimes over one-hundred years), constituting well-managed flower, bush, and tree rich areas that provide cultivated vegetables and fruits to its users for self-sufficiency. Currently, Europe holds some 3 million allotment gardens (Björkman 2000) of which Germany holds an estimated 1.4 million gardens, covering an area of 47,000 ha (Parker 2003) and involving nearly 5% of the Germans population (Holmer 2002).¹⁷

Allotment gardens originate from a social movement that sought to improve worker's health conditions in the beginning of the 1900s, having its earliest roots in Germany and Britain (Parker 2003). Hence, in contrast to the situation for many community gardens in the U.S., various governmental bodies early on supported allotments. This is also reflected in that leaseholds are usually written on long-term basis. For example, renewable leaseholds up to 25 years between a local allotment association and the local municipality is common in Stockholm City.¹⁸

Furthermore, and in contrast to community gardens, membership to an allotment plot is not determined by adherence to a neighborhood community. In Sweden, for example, gardeners may travel long distance to their plots, living in a different neighborhood than the one in which the allotment area is located. Often, however, they are required to be residents in the municipality in which the allotment site is situated, and only residents living in multi-family dwellings qualify to lease plots. European allotment areas are also effectively organized, nested all the way from the local level to the international, and some even have internet home pages, including magazines.¹⁹

During World Wars I and II, allotment areas were so common in Europe that they became a secondary avenue by which urban dwellers could survive in times of crisis. During World War I allotments played a crucial role in supplying the British with food. The government gave permission to local authorities to transform unoccupied lots into gardens (Parker 2003) and the number of allotment gardens surged from 600,000 to 1,500,000. By 1918 allotment gardens had provided the British with 2,000,000 tons of vegetables (Select Committee 1998). World War II sparked a new explosion in allotment gardening when the number of allotments rose from around 800,000 to 1,400,000. Today England holds some 200,000 allotment gardens (Björkman 2000).

France had about 600,000 allotments during World War II. After the war ended urbanization increased pressure on areas with allotments. In 1979 the French Environment Ministry passed reforms on allotment gardens, attempting to secure existing sites where possible, and provide alternative sites when this was not possible. Funding was also created for the formation of new sites (Crouch and Ward 1988).

The allotment garden movement spread from Holland and on to the Scandinavian

countries in the beginning of the 20th century (Crouch and Ward 1988).²⁰ In Sweden the first allotment area was established in 1904. During World War I and the 1930's economic depression, approximately 10% of the garden products produced in Sweden were supplied by the nation's 130,000 allotment gardens (Parker 2003).

4.4 Emerging urban commons

Urban commons not only encompass gardening activities. In England a number of so-called 'community forests' have emerged in recent years. These represent lands that are collectively managed by a diverse set of stakeholders. One example constitutes the community forests in the London Green Belt that encompass several hundred hectares of land with diverse ownership, including farmers, local authorities, nature conservation organizations and local businesses (<http://www.thameschase.org.uk/index.html>). Activities include the restoration and creation of woodlands through active management, volunteer days, the planting of new hedgerows and the creation of paths to make areas more accessible for the public. Community forests in England represent a mosaic of wooded landscapes, located on the edge of major towns or cities, close to where people live and work.²¹

In some municipalities of Stockholm County there is an increasing trend towards the establishment of partnership contracts between a local municipality and local neighborhood groups. Such contracts are referred to as "brukaravtal" (e.g. use right agreements) that transfer management responsibility to portions of state-owned lands (often degraded habitats) to local neighborhood groups that can use them for various activities, such as habitat restoration and improvement.²²

5. Urban commons and sustainability making of cities

While common lands face similar, if not even greater dissipation than public land in city-regions, they may offer an effective alternative to land privatization for governments to more closely consider. For example, governments may reduce transaction costs related to the maintenance and management of much public land by devolving management rights down to local user groups (Colding et al. 2006). In such institutional arrangements, governments may retain ownership to land, but transfer other bundles of property rights to local user groups that will bear most of the costs related to maintenance and management of land. Hence, and as argued here, urban commons could contribute to that a larger proportion of urban green space is adequately maintained, managed and preserved.

As the reviewed examples of urban commons presented in this chapter suggest, governments need to provide sufficiently stable property rights conditions in order to stimulate self-organizing, long-term investments in active land management. As touched upon here, such incentives include the establishment of long-term leaseholds of state-owned lands or by incorporating urban commons in local comprehensive plans. While there might exist profound economic rationales behind an increasing loss of public land in urban settings, the long-term environmental consequences of such path-dependent development need to be adequately addressed in the sustainability making of growing cities. For example, the development of housing units at the former industrial waterfront in Brooklyn and Queens may be positive for the economic and community vitality of New York city, but may have potential negative implications for the longer-term sustainability of the city by taking place with limited consideration of environmental factors. Currently, thousands of housing units are being built in low-lying, coastal, flood-prone

locations that are subject to the increased flooding threat associated with climate change, including induced sea level rise (Solecki and Leichenko 2006).

Furthermore, governments need to consider land-use designs with a capacity to mitigate the current and global dissipation of ecosystem services (MA 2005), of which many are locally and regionally generated by the green spaces of cities. In **Table 2**, I have summarized a range of ecosystem services provided by the urban commons dealt with in this chapter. Furthermore, **Box 1** constitutes examples of ecological benefits provided by allotment areas. Most of these represent services that can be described as public goods and for which efficient property rights are difficult, if not impossible, to establish. Such services tend also to be extremely difficult to value in economic terms (Hougnier et al. 2006; Carpenter et al. 2006).

5.2 Applicability of commons in urban areas

While urban commons may be used in the redesign and modification of already developed urban core areas, it is not easy to modify existing urban green patches or to enlarge them (Colding 2007).²³ Throughout the world, urban core areas have seen little or moderate growth in recent years, while the surrounding suburban and peri-urban territories have grown at faster rates with a typical development of new suburban expansion spilling out from the core cities (Solecki and Leichenko 2006). Urban biodiversity usually also peaks at the suburban scale of the cityscape, where species tend to be ‘urban adapters’ (Blair 2001; McKinney 2002). Hence, opportunity for the development of urban commons is therefore likely greatest at the suburban parts of metropolitan areas, for example, when development of new housing and associated real estates are to take place. Alternatively, urban commons should be considered when it comes to transformation and management of many green patches

of cities that are biologically impoverished, such as much uniform tracts of land that exist in cities representing 'green desserts'. These could, for example, be transformed into community-gardens, or be managed by residents through leaseholds such as in the Swedish form of 'brukar-avtal'. As described in this chapter, several forms of ecosystem services could be promoted through such institutional arrangements.

Urban commons could also be explicitly designed in order to promote ecosystem management in cities. For example, local governments could certify that certain land be collectively managed through partnership arrangements between local governments, conservationists and nature stewardship groups to reach certain ecological goals. This may involve adaptive co-management designs²⁴ in different parts of the urban landscape. Such participatory designs could be created by governments as part of local Agenda 21 to lower transaction costs in ecosystem management, most notably costs incurred for monitoring ecosystems, designing regulations, coordinating users and enforcing regulations (Colding et al. 2006). Such designs could involve 'wildlife gardening' where the goal is to manage and restore the missing components in a landscape that will best meet animal needs (Colding et al. 2006; Colding 2007). Alternatively, they could be used to promote 'focal species', which are known to have broad-scale ecosystem effects and include species considered keystones and umbrella species (Bani et al. 2002; Dale et al. 2000) as well as 'mobile link species' that transfer matter and energy across trophic levels or link ecosystems over space (Lundberg and Moberg 2003). Urban commons with adaptive co-management could also serve as arenas for 'designed experiments' to improve ecological functions in cities (sensu Felson and Pickett 2005).

Presently demands for lands managed as commons is great in many cities. In the U.S., for example, it has been estimated that some 6.7 million households would take

up community gardening if an organized program were nearby (Jansson Waddick 2000). Demands for allotment gardening is also high in many countries (Björkman 2000; Select Committee 1998). Due to that many consumers in rich countries want a return to locally supplied foods to cut the air miles traveled by their daily bread, and that fast growing megacities in poor countries often lack the means of organizing their food imports, there is presently a huge demand for urban farming in many cities throughout the world (New Scientist 2006). Maintaining options for urban agriculture through wise local policies in urban areas should therefore be considered in the capacity building of growing cities, and in this context both community-gardens and allotment areas should be more widely supported. Furthermore, a number of environmental organizations and neighborhood associations are demanding a voice in zoning and planning decisions that affect their local communities (McDaniel and Alley, 2005), however, few approaches exist for their inclusion in ecosystem management activities (Colding 2007).

6. Conclusions

The various implications of property rights designs in urban areas have received scant interest by institutional scholars and researchers working at the interface of social and ecological systems. Based upon an economic theory of property rights, I have in this chapter described why many public domain spaces, including green areas, are inherently unsustainable and increasingly face dissipation in many cities throughout the world. As accounted for urbanization inevitably leads to increased privatisation and subdivision of land, driven by market incentives. Local governments often lack adequate funding for efficient maintenance and management of public domain spaces. As a consequence local governments are often compelled to sell out public land

and/or subdivide it. In parallel, and as a result of urbanization, a greater proportion of humans become landless. All of these factors contribute to an overall risk of increased ecological illiteracy among a greater number of city-residents and to a further erosion of urban ecosystem services. In this context, it becomes essential for governments to develop and promote opportunities for people to actively partake in land management schemes. As proposed here, urban commons represent viable alternatives for governments to consider when it comes to cost effective ecosystem management. As has been described and exemplified here, urban commons could contribute in the reconciliation of humans to nature in many urban settings and promote the generation of ecosystem services. As proposed they should be much more widely studied and considered in this context. While common property designs so far have received scant interest in the sustainability making of metropolitan areas, I have in this chapter sought to illuminate ways in which the commoners of the past could become the stakeholders of tomorrow in urban settings.

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Notes

¹ Metropolitan areas are here defined as “extended urbanized zones that are demographically, economically, and socially interconnected, [...] and include a variety of urban forms, such as high-density residential and commercial areas, lower-density suburbs, and lower-density peri-urban sites that are often still used for agricultural production (Solecki and Leichenko 2006: 22).

²Private ownership to land increases, e.g. with some 16,2% of the total land area representing private gardens within a radius of 20 km from the Stockholm city-center (Colding et al. 2006).

³ Access here refers to “the right to enter a defined physical area and enjoy nonsubtractive benefits” (Ostrom and Schlager 1996).

⁴ The social costs for the enclosure of common land in Britain adversely affected the welfare of the landless; however, many of the displaced peasants and their descendants became, in the longer-run, co-beneficiaries of the rural land enclosure, and yielded long term gains for society as a whole (Lee and Webster 2006)..

⁵ A public domain is defined as a “sphere of resource consumption within which consumption rights are unallocated” (Lee and Webster 2006:33). In cities these include parks, public transport, places of entertainment and worship, schools, hospitals and roads

⁶ Lee and Webster (2006) provide the examples of costs of queuing and costs of resolving conflicts between users.

⁷ This has for example been the case in parts of the London greenbelt where habitats due to underfunding have become degraded and largely avoided by the public (Colding et al. 2006).

⁸ According to the 2001 American Housing Survey, about 6% of the U.S. households are currently located in developments behind walls and fences (Solecki and Leichenko 2006). These so-called ‘gated communities’ are becoming the fashion in many U.S. metropolitan areas and several other countries, including China. Privately built, managed and governed neighbourhoods are the predominant form of new development in the U.S. with over 15% of housing stock in so-called common interest development in the year 2000 (c.f. Lee and Webster 2006).

⁹ Common lands have become rare in industrialized countries with few examples in cities. However, collectively owned and managed lands are more common in developing countries, although privatization of land increasingly replaces them (Pretty and Ward 2001). Examples of common lands include village woodlots, pastures, and irrigation water systems (Ostrom 1990), community-managed forests (Alcorn and Toledo 1998), pastoralist systems (Niamir-Fuller 1998), and the Main clam and lobster fishery in the U.S. (Acheson 1988; Hanna 1998). In many cases though, local communities’ land claims may be highly contested by governments, such as those of indigenous societies. Hence, stable common property systems need support and recognition by local governments (Alcorn and Toledo 1998).

¹⁰ Vacant land includes publicly and privately owned unused or abandoned land that once had structures on it and land with structures that have been abandoned, derelict, boarded up, partially destroyed or razed (Bowman and Pagano 1998).

¹¹ A telling account about the development of this grass-root movement is given by Schmelzkopf (1995) in her study of the Loisaida neighborhood in New York City. Loisaida was severely affected by the fiscal crisis that New York City endured during the 1970s when funds for public services were cut by more than 30 percent, followed by disinvestments, as landlords abandoned properties and banks and insurance companies withdrew investments. Because of foreclosures due from nonpayment of

taxes, much of the properties reverted to city ownership, and more than 3,400 housing units were demolished and at least 70 percent of the population displaced. The vacant lots became open space, which in 1973 became a resource for urban gardeners beginning by a small group of people who later called themselves the Green Guerillas.¹¹ Today Loisaida contains more than seventy-five gardens, of which 35 are on land leased from the city, two or more leased from private owners, and almost forty represent squatters on either private or city-owned land. New York City became involved in urban gardening in 1976 when the Department of Housing Preservation and Development (HDP) designed and built gardens throughout the city at an interim use basis of vacant land that awaited construction; however, gardens were quickly vandalized and abandoned due to that the city failed to consult or include neighborhood residents in the design and building of these gardens (Schmelzkopf 1995). Instead, the city created Operation Green Thumb (OGT) in 1978, a program devoted to support gardeners rather than to build gardens. OGT is now one of the largest city-run gardening programs in the United States.

¹² Public land that has been made available for this activity has usually been marginal, located next to railroad tracks or industrial sites (Linn 1999).

¹³ This includes dividing up the lots into individual plots, decide on membership dues or other means to cover costs of the garden, and finally start to till, fertilize, plant, and manage the gardens (Schmelzkopf 1996).

¹⁴ Some leases are terminable on short notice, such as the Adopt-A-Lot program in Baltimore, Maryland, that provides renewable one-year leases, but can be terminated upon thirty days notice for use of the lot for another public purpose by the city. In Chicago, community garden organizations are permitted to use sites that the city has agreed not to develop for three years, but the city refuses to enter into any leases with community garden groups (Schukoske 2000).

¹⁵ MGOs work with individuals and local associations to secure land for community gardens, organize effective garden groups, and expand resources for urban gardening (Janson Waddick 2000).

¹⁶ Colding et al. (2006) found that about one fifth of all allotment areas in greater Stockholm was located next to nature reserves.

¹⁷ In the United States and Canada allotment gardening did not develop until relatively late in the Nineteenth Century as a result of economic crises and war. The urban gardens in these countries also follow the pattern found in the European countries, after crises waned gardens fell into disuse. At the peak of the gardening movement 20 million gardens existed in the United States (Parker 2003). In 1988 there were a reported 5 million allotment holders in the United States (Crouch and Ward 1988).

¹⁸ Even though there exist many cases where European allotment areas has been expropriated, or removed and relocated to other parts (often from urban cores to more suburban settings), allotment areas constitute a quite stable common property right regime.

¹⁹ E.g. in Sweden each allotment area is organized in an allotment association to which plot-holders are members having equal votes and shares. Plot-holders pay an annual fee of 4000-5000 SEK in rent per year for the plot. Currently, some 275 local allotment associations exist in Sweden that in turn is organized into a Regional Allotment Association. This organization acts on behalf of the plot holders to negotiate lease agreements with the municipality, and assisting in evaluating prices for cabins and associated equipment when owners wish to alienate their holding. The regional associations are in turn members in a national organization with some 27 000

members. The Swedish Allotment Association is a member in the Nordic allotment association, which in turn is a member in the International allotment association. The national organization also has its own magazine, *Kolonisten*, where useful gardening tips and other relevant issues are communicated among plot-holders.

²⁰Denmark holds some 40.000 allotment gardens, Finland 5000, and Norway 2 500 (Björkman, 2000).

²¹ One example constitutes the Thames Chase community forest to the east of London, with plans to plant 5.5 million trees on some 2.000 ha of land by 2030 to increase woodland cover. Since 1990 over 1.3 million new trees have been planted equaling 470 ha of woodland (<http://www.thameschase.org.uk/index.html>).

²²One example constitutes Enskede where some 20 “brukaravtal” has been established (Peter Grimms, Enskede Parkförvaltning, pers. com. 20050427).

²³One interesting exception constitutes Shanghai, where green areas have increased in parallel with urban expansion from less than 9 km² in 1975 to more than 250 km² in 2005 (Elmqvist et al. in press).

²⁴Adaptive co-management is an approach tailored to specific places and situations and supported by, and working with, various organizations at different levels in society (Gadgil et al. 2000; Folke et al. 2003; Olsson et al. 2004). Adaptive co-management emphasizes learning-by-doing in management, where management objectives are treated as ‘experiments’ from which people can learn by testing and evaluating different management policies (Walters 1986).

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FIGURE CAPTIONS

Figure 1. The proportion of persons living in one- and two-dwelling buildings decreases successively with population density, typically with major, larger cities having the lowest proportion. Examples derived from Sweden. SOURCE: SCB (2007).

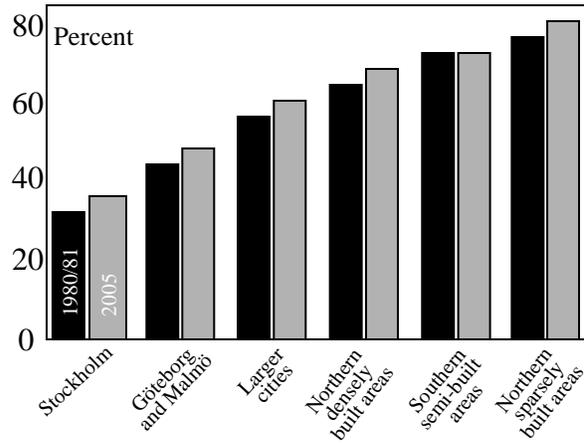


Figure 1.

TABLE 1. Bundles of property rights associated with positions.

	Owner	Proprietor	Claimant	Authorized user	Authorized entrant
Access	X	X	X	X	X
Withdrawal	X	X	X	X	
Management	X	X	X		
Exclusion	X	X			
Alienation	X				

The five property rights in the table are independent of one another, but are frequently held in the cumulative manner arranged as shown. They include the rights of *access* (i.e. “the right to enter a defined physical area and enjoy nonsubtractive benefits”); *withdrawal* (“the right to obtain the resource units or “products” of a resource”); *management* (“the right to regulate internal use patterns and transform the resource by making improvements”); *exclusion* (“the right to determine who will have an access right, and how that right may be transferred”); and *alienation* (“the right to sell or lease either or both of the above collective-choice rights”) [Ostrom and Schlager 1996: 133]. The bundles of property rights are held by individuals with different positions and named accordingly.

Source: Adapted from Schlager and Ostrom (1992:252).

TABLE 2. Ecosystem services provided by community gardens and allotment areas.

These include provisioning services (the products obtained from ecosystems); regulating services (the benefits obtained from the regulation of ecosystem processes); cultural services (the nonmaterial benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation, and aesthetic experiences); and the supporting services (those that are necessary for the production of all other ecosystem services). (MA 2005).

Provisioning services

Food (fruits & vegetables) *Source of food and subsistence income* (1)

Ornamental resources (flowers) (2)

Cultural services

Aesthetic values

Bringing some sense of nature into an area (3); *greening of areas* (4); *significant positive effects on surrounding property values* (5)

Inspiration

Act as a mental stimulus for elderly people delaying the onset of dementia (6)

Nature education

Gardens as arenas where urban residents can shape their relation to nature and may learn the importance of positive human inputs into landscape most clearly (7)

Recreation

Safe environment for outdoor activities (8); *Physical health benefits* (9); *Mental health benefits* (10)

Social relations

Build a sense of community among neighbors; improve social contact (11); *abate criminal activity* (12); *Fostering positive interracial relationships* (13)

Regulating services

Air filtration (14)

Erosion regulation

Noise reduction

Nutrient retention

Pest regulation

Regulation of microclimate

Surface water drainage

Supporting services

Habitat for flora & fauna (15)

Seed banks for rare vegetable species (16)

Soil formation

Seed dispersal

Pollination (17)

Water cycling

Sources: (1) Linn 1999, Björkman 2000, Select Committee 1998; (2) Björkman 2000, Colding et al. 2006; (3) Schmelzkopf 1996; (4) Schukoske; (5) Voicu and Been 2006; (6) Grahn 1993; (7) Rodhe and Kendle 1997; (8) Shinew et al. 2004; (9) Kaplan and Kaplan 1989; (10) Select Committee 1998; (11) Lewis 1992, Select Committee 1998; (12) Schmelzkopf 1996, Linn 1999; (13) Shinew et al. 2004; (14) Select Committee 1998; (15) Select Committee 1998; (16) Select Committee 1998; (17) Colding et al. 2006; Andresson et al. in press; see also Box 1.

BOX 1. Ecological values of allotment areas.

Few scientific studies exist on the ecological values of allotment areas. However, their role in contributing to biodiversity conservation in urban settings is presumably large. A study from United Kingdom reveals that allotment garden plots and allotment sites hold on average up to 30% higher species diversity than urban parks (Select Committee 1998). Also, in a study from Stockholm City, allotment sites were found to hold a much higher abundance of bumblebees than cemeteries and urban parks (Andersson et al. in press).

While allotment areas only cover some 0.3% of the land in greater Stockholm, they tend to be extremely biodiversity-rich (Colding et al. 2006). In Stockholm City, for example, an allotment plot was found to contain 447 different plant species on a mere area of 400m² (Björkman 2000). Allotment gardeners adopt several practices that promote conditions for pollinating insects that are declining in many European countries and which represent key a functional group for many wild plants, and food cultivars associated with agriculture (Colding et al. 2006). Due to the cultivation of colorful flowers that increase flower richness and due to intensive management that extends the length of the flowering period compared to other areas, allotment gardeners provide a prolonged supply of nectar for pollinators. Moreover, 45% of the allotment gardeners in Stockholm City intentionally plant flowers with the sole intent to attract pollinators. In addition, many native plant species which do not fit the aesthetic ideals of entrepreneurial-managed cemeteries and public parks, such as *Salix* spp, are allowed to grow on allotment sites that provide a key food source for early-flying bumblebee species (Andersson et al. in press). Hence, management practices in allotment gardens of Stockholm City clearly benefit pollinators, and the difference between the areas seem to increase the total number of species with several

Comment [SB1]: Bumblebees?

bumblebee species only found in allotment areas (i.e. *B. sylvarum*, *B. subterraneus*, *B. ruderarius* and *B. norvegicus*) (Andersson et al. in press). In fact, the network of allotment sites in the Stockholm urban core is likely to be functionally connected by several invertebrate metapopulations (Colding et al. 2006).