Urban Open Greenspace as a Commons

An Exploratory Case Study in Greece

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This paper defines urban open greenspace as an urban commons and empirically explores the possibility of its collective management, using Volos city, one of the major urban areas in Greece, as a case study. A survey of about two thousand people was conducted for this purpose, which examined, inter alia, people's perception of the condition and qualities of urban greenspace, their views on a possible reconfiguration of property rights on the resource, and their willingness to collaborate on the self-governance of urban greenspace. Moreover, using ordered logit models, we explore the conditions, values, opinions and characteristics that affect the likelihood of people getting involved in collective management arrangements. The results indicate that users have reservations about such arrangements, which may be attributed to a lack of trust both in each other and in public authorities and institutions. This reveals a considerable deficit in social capital, which is regarded as essential for fostering cooperation in collective-action situations.

1 Introduction

Rapid urbanization over the past decades and increasing population density in urban centres have had a significant effect on the urban natural environment, causing many problems to modern cities, both environmental and social. Urban open greenspaces (UOGs) have a key role to play in addressing these problems, since they are not only the lungs of the city, but also places for healthy socialization (Swanwick et al. 2003; Wolch et al. 2014). The protection and efficient management of UOG, therefore, constitutes a high priority, especially in countries like Greece, which has one of the lowest levels of urban green per inhabitant in Europe (Ntouros 2001). In addition, the reduction of public resources available for UOG makes it necessary to explore new and more innovative ways for UOG management and conservation. A number of scholars, policy makers and organizations have placed emphasis on bottom-up approaches, acknowledging (at least implicitly) that open greenspace is, in essence, a common pool resource (CPR) and as such the public, together with the local authorities and other stakeholders, should collectively engage in its planning, management and protection (Rohring and Gailing 2005; Ernstson et al. 2008).

Theoretical and empirical studies of urban commons have been rather limited (Blomley 2008; Colding et al. 2013). By and large, the literature has explored the commons in rural settings (e.g. irrigation water systems, pastoral systems and local fisheries), and it was not until recently that scholars turned their attention to urban CPRs and their management problems (inter alia Blomley 2008; Foster 2012; O'Brien 2012; Colding and Barthel 2013; Colding et al. 2013; Huron 2015; Shah and Garg 2017). Yet, given the complexity and diversity of the urban commons, many aspects remain under-researched (Moss 2014).

The current paper contributes to this literature, defining UOG as a commons and exploring creative ways for its management and sustainable development. The research questions it addresses include the following: How do urban dwellers perceive and value UOG? Are they willing to get involved in its management and protection? What factors affect their disposition for participating in collective management schemes? To do so, the paper uses primary data collected through a survey conducted in the city of Volos to examine people's views on the condition and qualities of UOG as well as the possibility of collective management, focusing on a possible reconfiguration of property rights on the resource, the management competency of various stakeholders (authorities, organizations, community and individuals), the social relations between users and their willingness to get involved in forms of collective management. Moreover, using logistic regression, the paper explores which conditions, values, opinions and characteristics affect users' likelihood to participate in possible commons schemes of UOG management.

The paper is structured as follows. Section 2 defines CPRs and discusses issues of collective management. Section 3 identifies UOG as a commons and section 4 presents briefly the key characteristics of UOGs in Volos. Sections 5 and 6 outline the research methodology and the results of the analysis conducted, respectively. Finally, section 7 concludes.

2 Common Pool Resources and their Management

CPRs are a special category of resources (either natural or man-made) which share two main characteristics: non-excludability, meaning that it is too difficult (i.e. too costly) to exclude anyone from using them, and rivalry, meaning that consumption by someone reduces availability to others. These features enable rational individuals to use as much of the resource as they like without taking full responsibility for their actions by disregarding the social, long-term costs from overuse (Bromley 1991). As a result, the resource is gradually depleted, which eventually leads to its degradation and destruction, a situation known as "the tragedy of the commons" (Hardin 1968).

Possible solutions to this tragedy would be to instil a stewardship ethic in users and to encourage moral and altruistic behaviour (Worrell and Appleby 2000; Barclay 2004), and/or, as Hardin (1968) and others (e.g. Demsetz 1967; Libecap 2009) have highlighted, to attribute clearly defined property rights, either to individuals (privatization) or to the state (nationalization), giving the owner incentives and the authority to enforce resource sustainability.

However, Hardin's dichotomic governance solutions (privatization vs. nationalization) have been criticized on the basis that they restrict the rights and actions of users in real life, destroying the social relations, networks and values (i.e. the social capital[1]) that characterize local communities, to the detriment of both these communities and the long-term efficiency of the resource. The most prominent exponent of this view is the 2009 Nobel laureate in economics, Elinor Ostrom. Drawing on a number of empirical studies across the world, Ostrom (1990, 1992, 1999, 2000, 2008, 2010) and others (inter alia Wade, 1988; Ostrom et al., 1992; Stern et al., 2002; Bollier and Helfrich, 2012) demonstrated that communities can successfully manage commons by themselves, even in the absence of private property rights (privatization) and a strong regulatory authority (nationalization).

As a result, a third, more socially acceptable governance regime emerges, where the users themselves overcome collective-action problems and form strong and stable institutions for the sustainable management and appropriation of their CPR within the given legislative framework. These institutions are specific social/informal arrangements (rules, norms, practices etc.) and formal regulations (laws, constitutions etc.) which define and allocate rights and obligations among the involved parties and provide the mechanisms for policing, enforcement and conflict resolution.

In addition, this strand of the literature (inter alia: Ostrom 1990, 2006; Baland and Platteau 1996; Ostrom et al. 1999; Agrawal 2003; Briasouli 2003; Arvanitidis et al. 2015) has identified a number of characteristics that are common to successful collective governance regimes. These can be organized under five headings. The first group of characteristics concern the resource itself; for example, resources of small size with definable boundaries can be preserved more easily than large-scale resources. The second group refers to the characteristics of the users: Homogeneous groups with a dense social network based on trust and with experience in collective action do better than others. The third group of conditions concentrates on the relationship between the resource and its users: Collective governance is more likely to be successful if there is a perceptible threat of resource depletion, if the community (current and future generations) depends on the resource, and if the community is geographically close to it. The fourth group refers to the governance structure and the arrangements to be developed to manage the CPR: Simple structures that emerge locally, are user-based and have simple, internal and low-cost policing and enforcement procedures are preferable. Finally, the last group concerns the external environment: Trusting and accom-

[1] Social capital refers to "features of social life - networks, norms, and trust- that enable participants to act together more effectively to pursue shared objectives" (Putnam 1995 664-665). Social capital helps reduce information deficiencies and transaction costs, enhancing the scope for interaction, cooperation, coordination and collective action.

modating local and central authorities as well as clear and supportive state regulations (with formal incentives and sanctions) help greatly.

In a nutshell, a collective governance regime is successful when the resource is managed collectively by an identifiable community of interlinked users and stakeholders, who regulate appropriation of the CPR in line with local preferences, practices and modes of collective action (formal and informal). This perspective is essentially instrumental in nature (Blomley 2008). Moreover, it approaches the commons through an institutional or economic lens, placing emphasis on the internal characteristics and structure of the governance regime and downplaying its political dimension. In contrast, other scholars (inter alia: Klein,2001; Harvey 2003, 2012; De Angelis 2007) perceive the commons in a rather different way. For them, the commons depend upon, and are produced in relation to, a constitutive outside, e.g. in the form of political opposition or a conflict or struggle against the forces of market enclosure. This literature highlights the rights of the community to the resource on the basis of ingrained practices of appropriation, collective habitation and investments made. By virtue of being on site for a long time and using and relying upon the commons, users both acquire and sustain legitimate rights to it. In that way the commons are socially constructed and politically produced. This process of commons creation or reclamation has further spatial, social and political implications. As De Angelis (2007) and Harvey (2012) have argued, in this way, the commoners proclaim their "right to the city", opening up new horizons for more participatory forms of governance which promote socio-spatial justice and the (re)imagination of the city. Evidently, this line of thought has a more global perspective than the Ostromian approach, which is mainly local and focuses on practical issues of long-term CPR management and maintenance (Huron 2015). Our work aligns with the latter perspective.

3 Urban Open Greenspace as a Commons

Several definitions have been given to describe urban greenspace, reflecting varying disciplines and contexts (see Taylor and Hochuli 2017). For the purpose of the current work, we draw on Briasouli (2003), Levent et at. (2009) and Lo and Jim (2012), amongst others, to define UOG as public and private urban open spaces that are primarily covered by vegetation and generally accessible to the public. As such, UOGs include parks, squares, playgrounds, land trusts (school and church yards, vacant plots etc.) and other recreational open spaces. UOGs are of vital importance for the quality of life in cities, as they provide not only ecological, but also aesthetic, social and economic benefits (Swanwick et al. 2003; Arvanitidis et al. 2009; Wolch et al. 2014).

UOG is a special type of CPR (Briasouli 2003; Huron 2015; Shah and Garg 2017) in that it is not possible to exclude people from using it (non-excludability), whereas use by some reduces the quantity or quality available to others (rivalry). The latter fact stems from the "saturated nature of cities", i.e. the fact that cities house an increasingly large number of people in a relatively small amount of space (Huron 2015). This situation creates great pressure on urban land, forcing urban dwellers to either share or compete for the resource. In addition, under-investment in the provision and maintenance of UOG by the local authorities (due to a lack of means and/or political will) leads to a decline of urban green (GreenKeys 2008; Colding et al. 2013), requiring new and innovative ways for its management so as to avoid the "tragedy". The regime of collective governance may constitute such an option.

The collective governance of UOG as a commons concerns a system of institutional arrangements (rules, norms, mechanisms etc.) that regulate the appropriation and maintenance of the CPR. These institutions are developed collectively by a trusting community of local users and stakeholders who depend on the resource for their well-being. Membership in the community may be defined formally or according to ex post criteria, such as residence or acceptance by current members. The interest groups participating in the governance regime play different roles and have different sets of (de jure or de facto) rights that are unlikely to be either exclusive or easily transferable. It is important to note that the practical management of the resource constitutes a critical feature of the governance regime and as such, its success depends not so much on land ownership per se but on the provision and allocation of diverse bundles of rights to the parties involved (Colding et al. 2013; Shah and Garg 2017). The way in which these rights are structured and used has a great impact on the benefits generated, on equity issues and, ultimately, on the sustainability of the resource (Colding and Barthel 2013). Inequalities emerge when different groups derive different levels of benefits from the resource, creating winners and losers. Power asymmetries between groups play a key role in these processes, usually reproducing existing societal inequalities in the access to and appropriation of the resource (Shah and Garg 2017).

4 Urban Greenspace in Volos City

The previous section defined UOG as a commons and explored the prospects of collective governance. It was argued that this regime provides an innovative and promising solution to economic and social challenges that modern cities are facing. Successful development of such governance structures depends to a great extent on the importance the local community attaches to the resource, on the strength of their social ties and trust relations and on their willingness to participate in the management

and protection of the resource. We use these concepts and ideas to analyze UOG in Volos city. The choice of this specific case rests on the fact that Volos is a typical, large enough Greek city with recorded grassroots initiatives and movements (Lowen 2012; Streinzer 2014).

Volos city is the capital of the Magnesia prefecture and one of the five largest Greek cities with a population of over 140,000 residents (ELSTAT 2014). Volos has a positive population growth rate[2] and accommodates a substantial number of secondary and tertiary economic activities, including tourism and tertiary education.

The city's greenspace covers only about 5% of its total area (Municipality of Volos 2006). The percentage of UOG per inhabitant is 6.4 square meters (GreenKeys 2008), which is quite low compared to other European cities of similar size and the European standard[3]. As regards the distribution of UOG, most of it is located along the coast, which leaves the rest of the city suffering from a lack of adequate UOG (Municipality of Volos 2006). Although there are small greenspaces scattered all over the city (small squares, playgrounds, vacant plots etc.), they do not meet the standards that modern cities should follow (GreenKeys 2008).

The quality of UOG in Volos is quite low, too. This is due to the local authorities' limited and now shrinking resources and the absence of a long-term municipal greenspace strategy, so only the most essential works are carried out, whereas acts of vandalism and littering are highly visible (GreenKeys 2008). Overall, the quantity and quality of UOGs in Volos are low, they lack cohesion and enjoy only medium levels of maintenance and care.

5 Research Concept and Methodology

The previous section outlined the poor conditions of UOG in Volos, indicating the inability of the local authorities to adequately address the issue. Clearly, a new approach to UOG management seems necessary to sustainably maintain and protect the resource. Collective governance by the community seems an interesting option.

To that end, the research we conducted explored citizens' views regarding UOG, the value and importance they attach to the resource, the strength of their social ties and trust relations, and their willingness to get involved in various tentative schemes of collective UOG governance. Data were collected through a survey, which, using structured interviews in the form of a questionnaire, examined the views, attitudes and behaviour of users concerning a number of relevant issues, such as the condition of the resource, intensity of use and the degree of dependence on the resource, the quality of social capital and the users' willingness to be engaged in some form of collective initiatives for the sustainable management of UOG.

The questionnaire we used consists of five parts containing 22 questions of all types: measurement, dichotomous, ordinal as well as Likert-scale and semantic-differential questions on a scale from 0 (denoting strong disagreement, negative opinion etc.) to 10 (denoting strong agreement, positive opinion etc.). In the first part, the respondents were informed of the purpose of the research and the anonymity of participation. The second part recorded their views regarding the condition of UOGs (adequacy, quality, accessibility etc.) in Volos and their dependence on the resource. The third part focused on their views on the capability of various stakeholders to efficiently manage UOG and on a possible reconfiguration of property rights on the resource. The forth part examined users' trusting attitude (a key dimension of social capital) as well as their attitudes towards cooperation for collective governance of UOGs. Finally, the last part of the questionnaire gathered socio-demographic information, such as age, gender, education and income level. The survey questions were pre-tested in a pilot study enabling fine-tuning of the instrument.

The survey was conducted in January 2012 and was repeated after two years, in January 2014, using a random sample of people visiting UOGs at the time of data collection. The questionnaires were distributed in person by the members of the research team, and respondents were asked to complete them on the spot. In order to increase response rate and quality, participants could choose whether to have the questions read to them (with the responses being recorded by the researcher) or to complete the questions by themselves in their own time. The questionnaires were collected, validated, and then coded and analyzed to generate a number of statistics illustrating the respondents' answers to the issues raised.

6 Analysis

6.1 Response rate and composition of respondents

A total of 2,200 questionnaires were collected, of which 1,976 (89.82%) were valid. The gender composition of the valid sample was about 49% male and 51% female (see

[2] The population growth rate during the past two decades was almost 8% (1991-01) and 15% (2001-11).

[3] The European Environment Agency acknowledges that UOG per inhabitant should extend beyond 9 m² for cities to be sustainable. UOG per inhabitant in other European cities is approximately 144 m² in Dresden, 35 m² in Zurich, 27 m² in Amsterdam, and 9 m² in London, Rome and Paris.

Table 1), indicating that urban greenspace is used equally by both sexes. The average age of the respondents was about 35 years, with the youngest respondent being 17 years old and the oldest 88. The majority of respondents hold a university degree (47.5%), followed by those that have completed secondary education (27.7%). As regards their monthly household income, most respondents (27.9%) earn between € 1,000 to € 1,500, followed by those in the € 500 to € 1,000 bracket (22.4%), figures indicative of the financial stress that Greek households have been experiencing due to the recession and the austerity measures taken.[4]

6.2 Evaluation of UOG

First, users were asked to evaluate the adequacy, accessibility and quality (management effectiveness and actual condition) of the existing UOG (see Table 2). They indicate that UOG quantity is about medium (mean: 4.4), enjoy the relatively good accessibility of UOGs (mean: 5.9), but find the quality of management on the part of the city lacking (mean: 3.4) and believe that UOGs are in a medium to low condition (mean: 3.6). In addition, users were asked to assess the necessity for qualitative improvements of UOGs and the contribution this would make to citizens' well-being.

			Distribution (%)	Sample size	Mean	Standard deviation	Median	Percentiles		
								25	50	75
Gender	Male		49.3	1,975						
	Female		50.7							
Age (years)	Below mean		57.7	1,969	35.2	12.8	32	24	32	44
	Above mean		42.0							
Education	Primary or less	(1)	2.2	1,969	*(3.3)*	*(1.0)*	*(4)*	*(2)*	*(4)*	*(4)*
	Secondary	(2)	27.7							
	Post-secondary	(3)	14.0							
	Tertiary	(4)	47.5							
	Postgrad	(5)	8.6							
Family	0: no children		39.8	1,317						
	1: one or more children		60.2							
Monthly household income (€)	Up to 300	(1)	4.6	1,963	*(4.2)*	*(1.5)*	*(4)*	*(3)*	*(4)*	*(5)*
	301-500	(2)	6.9							
	501-1,000	(3)	22.4							
	1,001-1,500	(4)	27.9							
	1,501-2,000	(5)	20.9							
	2,001-3,000	(6)	11.3							
	3,001-5,000	(7)	3.9							
	5,001-10,000	(8)	1.3							
	above 10,000	(9)	0.8							

Table 1: Composition of respondents
Source: UOG survey

They indicated that qualitative improvement is necessary (mean: 8.2, most responses in the highest value) and that this would improve people's well-being and the quality of urban life in general (mean: 8.3, most responses in the highest value).

[4] The country's long-standing public debt problem escalated to crisis at the beginning of 2010, resulting in a general collapse of the Greek economy. The European Commission, the International Monetary Fund (IMF) and the European Central Bank (ECB) provided financial assistance in two bailout programmes (in 2010 and 2012) in return for harsh austerity measures (deep budget cuts and steep tax increases imposed through 13 austerity packages) which contributed to a worsening of the recession. By the end of 2013, the economy had contracted by about 25%, unemployment had tripled to exceed 25% (above 50% for young people), average real gross earnings had fallen below their 2000 level by 9%, and a considerable number of individuals and families found themselves in conditions of extreme hardship (the proportion of the population below the 2009 poverty line exceeded 38%) (Matsaganis 2013; Matsaganis and Leventi 2014).

	0	1	2	3	4	5	6	7	8	9	10	Sample size	Mean	Standard deviation
	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)			
	0: Not at all/low								10: Very much/high					
Adequacy	3.5	4.4	9.7	16.3	19.0	18.2	11.7	8.8	4.4	2.2	1.8	*1,973*	*4.4*	*2.2*
Accessibility	1.7	2.9	5.8	7.1	10.0	14.9	12.6	15.5	14.3	9.6	5.5	*1,969*	*5.9*	*2.4*
Management quality	11.4	13.6	15.2	12.7	14.6	15.5	5.8	4.3	3.7	1.9	1.3	*1,969*	*3.4*	*2.4*
Condition	9.0	12.7	13.4	14.0	15.8	15.9	7.5	5.1	3.4	1.6	1.5	*1,973*	*3.6*	*2.4*
Qualitative improvement is necessary	0.8	0.5	0.8	1.5	2.3	5.1	6.3	11.3	16.6	17.9	36.9	*1,974*	*8.2*	*2.1*
Contribute to well-being	0.7	0.5	1.0	1.4	2.0	5.0	5.5	9.1	15.0	21.4	38.4	*1,970*	*8.3*	*2.0*

Table 2: Condition of UOG
Source: UOG survey

6.3 Property rights configuration

A number of questions explored the respondents' views and attitudes regarding the (re-)configuration of property rights for the provision and financing of UOGs. In particular, we asked whether people would be willing to accept, first, the introduction of an entrance fee to ensure successful policing, maintenance and overall improvement of UOGs, second, the introduction of controlled access to help prevent vandalism and degradation of UOGs, third, the allocation of part of UOGs to profitable but friendly uses (e.g. cafe, snack bar, soda fountain etc.) to provide necessary funding for their improvement, and finally, the allocation of property rights to organized groups of citizens (i.e. environmental organizations, elderly associations, schools) to help ensure successful policing, maintenance and improvement of UOGs.

As Table 3 reveals, the respondents were particularly opposed to the idea of entrance fees as a means to ensurethe qualitative improvement of UOGs (mean: 3.5, with a majority of respondents favouring the lowest value), where as they took a rather positive stance to the proposal for controlled access in order to prevent acts of vandalism and degradation (mean: 6.5, with most respondents favouring the highest value). Their answers were similar regarding the assignment of property rights to organized groups of citizens for maintenance reasons (mean: 6.7). As regards the possibility of UOG financing through the assignment of property rights to profitable but friendly uses, most respondents (52.1%) had a rather positive view (mean: 6.3), while a few (32.5%) were neutral or undecided.

In the next question, people were asked to assess the competency of various stakeholders to efficiently manage the resource (see Table 4). The stakeholders were the central state, local authorities, specialized management bodies, environmental groups/organizations, organized groups of citizens, all citizens, and private investors. Respondents thought that local authorities and environmental organizations are the most capable of efficiently managing UOGs (mean value of 7.4 and 7.2, respectively), followed by locally organized groups of citizens (mean: 6.6), specialized management bodies (mean: 6.3) and all citizens together (mean: 6.1). At the bottom of the list were the central state (mean: 5.8) and private investors (mean: 5.1).

0	1	2	3	4	5	6	7	8	9	10	Sample size	Mean	Standard deviation
(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)			
0: Strongly disagree					10: Strongly agree								
Introduction of an entrance fee to ensure successful policing, maintenance and improvement of UOGs													
32.8	6.9	7.5	6.9	5.0	13.9	5.6	6.3	5.1	2.8	7.3	*1,975*	*3.5*	*3.3*
Introduction of controlled access to help prevent vandalism and degradation of UOGs													
8.1	2.5	3.5	4.1	4.0	12.2	8.2	11.7	13.1	9.6	23.2	*1,974*	*6.5*	*3.1*
Allocation of property rights to profitable but friendly uses to provide necessary funding for UOG improvement													
6.4	1.5	3.1	4.5	5.5	16.1	10.9	15.0	15.7	6.4	15.0	*1,973*	*6.3*	*2.8*
Allocation of property rights to organized groups of citizens to contribute to successful policing, maintenance and improvement of UOGs													
4.8	1.9	2.4	3.8	4.3	14.6	11.5	13.7	14.7	7.9	20.3	*1,975*	*6.7*	*2.7*

Table 3: Views and attitudes towards UOG issues
Source: UOG survey

Summarizing the findings, it seems that there is a positive attitude towards management by organized citizen groups, either environmental or local, whereas the competency of both the central state (nationalization) and the private sector (privatization) is called in question. Regarding UOG self-management by all citizens, respondents were positive but somewhat sceptical.

degree of people's dependence on the resource, the level of their trust, and their willingness to cooperate with others in the management of UOG as a commons.

Four questions were used to assess people's dependence on UOGs and on the city in general. The first question explored the frequency of UOG use. Although there is a

	0 (%)	1 (%)	2 (%)	3 (%)	4 (%)	5 (%)	6 (%)	7 (%)	8 (%)	9 (%)	10 (%)	Sample size	Mean	Standard deviation
Central state	13.2	4.6	6.7	5.0	4.9	10.2	6.8	8.7	9.6	7.3	23.0	1,965	5.8	3.5
Local authorities	4.9	2.3	3.5	3.9	3.2	7.5	5.0	7.2	12.2	13.5	36.9	1,970	7.4	3.0
Specialized bodies	8.3	1.7	4.3	4.7	4.0	13.4	8.7	12.6	16.3	10.5	15.4	1,958	6.3	3.0
Environmental organizations	3.0	.6	1.5	2.2	2.8	11.2	10.8	16.0	19.7	11.1	21.0	1,966	7.2	2.4
Organized groups of citizens	4.5	1.0	3.1	4.4	5.2	13.6	12.2	15.0	16.9	8.8	15.3	1,967	6.6	2.6
All citizens	8.5	2.7	4.6	4.9	5.3	14.2	9.0	11.1	13.6	7.6	18.5	1,966	6.1	3.1
Private investors	13.0	3.5	5.9	6.5	7.5	16.6	11.6	13.3	9.9	5.7	6.4	1,960	5.1	3.0

Table 4: Efficient management of UOGs
Source: UOG survey.

6.4 UOG as a commons

As discussed above, the literature has identified a number of design principles for sustainable management of the commons. In particular, it was found that successful collective governance emerges when the community (present and future generations) appreciates the resource and depends on it for its well-being, when users have strong, trust-based social relations, and when they feel comfortable collaborating both with each other and with other interested parties. Taking these factors under consideration, the current section investigates whether collective governance schemes can be developed for UOGs in Volos. This is done through a set of questions which explore the percentage of people who rarely visit UOGs (10.7%), more than 50% of respondents visit them at least once a week, and over 80% at least once a month (see Figure 1). These figures are low in comparison to European standards but are typical of greenspace usage in Volos and in Greece generally (GreenKeys 2008).

The second question explored whether respondents would, ceteris paribus, consider moving to another city. On this issue, respondents appeared divided (Table 5): a significant part of the sample (36.3%) would not consider moving (14.4% picked the lowest value), whereas 37.6% of respondents would consider moving if conditions were favourable (the remaining 26.1% were undecided). Finally, to assess people's intergenerational (long-term) commitment to the city and its resources, respondents were asked whether they believe their offspring would stay in Volos (Table 5). One out of three respondents (34.3%) thought their children would stay in the city, whereas the majority of respondents (40.9%) did not have a clear answer (placed on the middle of the scale) and one-fourth (24.7%) were rather sceptical. Overall, it became evident that people depend on UOGs to some extent and that appropriation of UOGs constitutes an integral part of living in Volos. However, a significant number of people do not feel particularly committed to the city, which raises questions about whether they would be willing to get involved and invest in long-term relations in order to manage and maintain UOGs.

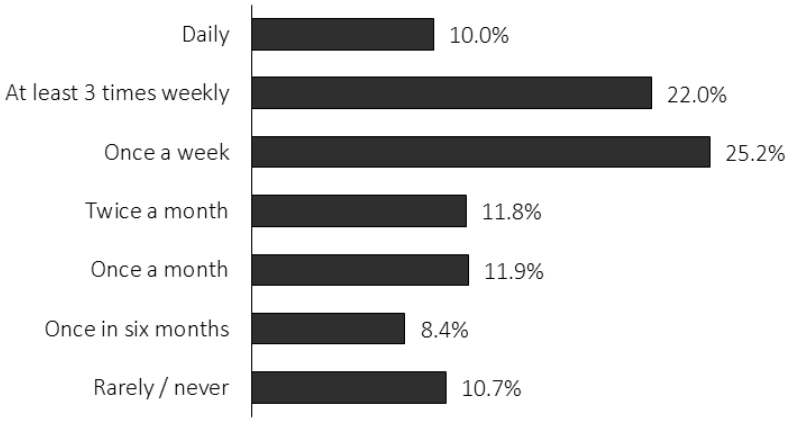

Figure 1: Frequency of UOG use
Source: UOG survey.

The next two questions were designed to assess the quality of trusting relations (the essence of social capital)[5], which are a vital factor in fostering cooperation in collective-action situations (Ostrom and Ahn 2003). First, the trusting attitude of respondents was measured using a semantic-differential question with the following options: "I do not trust someone until there is clear evidence that (s)he can be trusted" indicating low trust (score of 0) and "I trust someone until there is clear evidence that (s)he cannot be trusted" indicating high trust (score of 10). Table 6 presents the results, which clearly show the lack of trust (and thus the social capital deficit) that characterizes the citizens of Volos (Arvanitidis et al. 2015; Arvanitidis and Nasioka 2015) and of Greece in general.[6] Specifically, 38.8% of respondents described themselves as rather reserved and suspicious (14.6% picked the lowest value), 35.4% placed themselves in the middle of the scale, and only 25.9% put themselves on the high end of the trust spectrum.

Since interpersonal trust is a relative concept, depending on who it is directed at, the next question attempted to assess the degree of trust respondents have in various people or entities: friends, neighbours, fellow citizens, organized citizen groups, technocrats/scientists, local authorities and the central state. As Table 6 reveals, friends are perceived as the most trustworthy group (mean: 7.5), whereas people are rather reserved and cautious in their relations with all people/entities (in trust order: technocrats/scientists, neighbours, organized groups and fellow citizens) and especially towards the state, both at the local and central level.

Finally, we examined whether respondents had previous experience in civic participation and how willing they would be to cooperate with others in the self-governance of UOGs. As regards the former, only a small share of

	0	1	2	3	4	5	6	7	8	9	10	Sample size	Mean	Standard deviation
	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)			
	0: Definitely no										10: Definitely yes			
Consider moving	14.9	7.3	7.2	6.9	7.0	12.5	6.6	7.8	10.0	7.2	12.6	*1,972*	*5.0*	*3.4*
Offspring will stay in the city	9.2	3.9	6.2	5.4	6.0	26.8	8.1	9.7	11.2	6.8	6.6	*1,965*	*5.3*	*2.8*

Table 5: Relation with the city
Source: UOG survey

		0	1	2	3	4	5	6	7	8	9	10	Sample size	Mean	Standard deviation
		(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)			
		0: Definitely no										10: Definitely yes			
General level of trust		14.6	6.9	9.1	8.2	9.7	17.9	7.8	8.4	8.4	4.1	5	*1,972*	*4.4*	*3*
Trust in	Friends	0.8	1.1	1.9	1.9	3.6	8.7	6.4	14.2	22.3	22	17.1	*1,972*	*7.5*	*2.2*
	Neighbours	7.5	6.5	9.4	10.7	12.2	19.5	14.1	10.1	5.9	2.3	1.8	*1,973*	*4.5*	*2.4*
	Fellow citizens	8.6	9	12.1	12.7	14.3	21.1	9.9	6.6	3.4	1.6	0.5	*1,973*	*3.9*	*2.3*
	Organized citizen groups	7.2	7.1	10.2	10.9	12.3	20.9	11.6	8.4	7	2.5	1.7	*1,973*	*4.4*	*2.5*
	Technocrats/ scientists	9.5	6.1	8.1	8.2	8.9	20.3	9.8	11.7	9.9	4.8	2.6	*1,970*	*4.7*	*2.7*
	Local authorities	24.4	16.6	15.7	11.4	8.4	12	4.8	4	1.3	1.1	0.4	*1,971*	*2.6*	*2.3*
	Central state	44.3	17.1	11.5	8.3	6	7.1	2.5	1.3	1.1	0.3	0.5	*1,974*	*1.7*	*2.1*

Table 6: Trust
Source: UOG survey

respondents (17.2%) reported that they participate in associations, cooperatives, clubs etc., which ties in with the previous finding regarding trust. Of those who reported membership in an organization, 53.2% indicated that they participate in one organization, 29.8% participate in two organizations, and the rest in three or more organizations.

As concerns their attitude towards cooperation for the self-management of UOGs, 68.9% of respondents were rather positive about cooperation with people they know quite well (9.7% were reserved), 53.9% had a positive attitude towards joining forces with organized groups (associations, cooperatives, etc.) (14.1% were rather reserved), but only 29.2% were happy to work together with all people, in contrast to 36.6%

[5] Although trust, norms and networks are all different (though interconnected) dimensions of social capital, it is the attitudinal aspect (i.e. trust) that drives its effects and constitutes the essence of the notion (Coleman 1990; Putnam 1995). On these grounds, trust is used as the key, if not the only, indicator of social capital (Paldam 2000).

[6] Several other studies (inter alia Paraskevopoulos 2006; Jones et al. 2008) report similar findings, that is, low and declining levels of social trust in Greece, offering a number of possible explanations: a rise in individualistic mentality and utilitarian political culture, increasing income disparities, strong clientelistic relations, increasing disappointment and distrust in political institutions, and the long period of authoritarianism along with a problematic transition to democracy during the first post-dictatorship period (1974-mid-1990s).

who were unwilling (see Table 7). These results reveal, once more, the low level of trust among citizens in general.

Cooperation with:	0	1	2	3	4	5	6	7	8	9	10	Sample size	Mean	Standard deviation
	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)			
	0: No										10: Yes			
… persons I know well	3.4	1.4	2.5	2.4	3.2	10.5	7.8	14.5	18.6	17.5	18.3	1,947	7.2	2.5
… organized groups	3.9	2.4	3.6	4.2	6.0	13.2	12.8	15.8	16.8	11.2	10.1	1,946	6.4	2.6
… everybody	13.3	8.7	7.3	7.3	7.3	17.9	9.0	8.0	7.2	5.9	8.1	1,949	4.7	3.1

Table 7: Attitude towards self-governance of UOGs as a commons
Source: UOG survey.

6.5 Determinants of UOG collective governance

The study uses ordered logit models to investigate which characteristics, views, stances and behavioural tendencies affect users' willingness to get involved in the collective management of UOG. We examine three slightly different arrangements which are reflected in three dependent variables: cooperation with people they know well, cooperation with organized groups and cooperation with everybody. In turn, the explanatory variables examined are (1) the socio-demographic characteristics of users (age, gender, education, income and family size), (2) their stances and views regarding UOGs (frequency of use, perceive increase in well-being due to UOG and the competency of local authorities to efficiently manage urban green), and (3) behavioural characteristics (commitment to the city and its resources, intergenerational commitment, trust attitudes and civic participation). Table 8 provides a description of the variables used.

In order to explore whether (and if so, to what degree and how) the aforementioned exploratory variables affects users' willingness to engage in the collective management of UOGs, we run ordered logistic regressions. Table 9 presents the estimated models with the variable coefficients, significance, standard errors and model statistics. It turns out that the following five variables do not seem to exert any significant effect on users' likelihood to get involved in the self-management of UOGs: age, the perceived efficiency of local authorities in managing the resource, users' commitment to the city and its UOGs (both current and future generations), and the frequency of UOG usage, which indicates that people's willingness to participate in such schemes is not really affected by the relationship they have with the resource.

The statistically significant indicators exert the expected influence on the likelihood of people to participate in the collective management of UOGs. A uniform effect across all models is observed for gender, with women reporting a higher willingness (probability) than men to participate in such schemes with either known individuals, organized groups or the general public. A significant and positive effect is also found for the importance of greenspace for their well-being and the quality of urban life. The higher this perceived importance, the greater the probability that people join forces for UOG management with those they know well and organized groups. The trust variables also perform well and have the expected signs. We see that, in general, higher levels of trust lead to an increased likelihood for participation in collective action. In particular, a higher level of trust in organized groups raises the likelihood of involvement in collective arrangements of all forms, whereas a higher level of trust in friends goes hand in hand with a higher willingness to collaborate with both friends and organized groups, and a higher level of interpersonal trust or trust in the state raises the probability for cooperation with everybody. Prior experience with civic engagement also raises the probability for people to get involved in collective management initiatives with everyone or with organized groups, an effect that is particularly strong for the former kind of arrangement. Somewhat unexpectedly, education, income and family size appear to have a negative effect on the likelihood to participate, arguably reflecting the lack of time these individuals have. Education is statistically significant in the first and the third model, indicating that an increase in education status (and presumably in job duties, responsibilities, workload etc.) lowers the chances of an individual joining forces with friends, and to a smaller extent with all parties, for the management of UOG. Similarly, higher income levels lower the probability of an individual cooperating with organized groups (with the effect being rather small). Finally, having a family (as opposed to being single or married with no kids) significantly reduces the likelihood to participate in collective management initiatives both with organized groups and all people, since there is little time left for pursuing such interests.

Interestingly, the effect of time on the likelihood of individuals participating in schemes of collective UOG management is considerable and statistically significant in the first and the third model, i.e. concerning cooperation with people the respondents know well and cooperation with everybody, respectively. This suggests that as time elapsed and the economic recession deepened, Greek society showed signs of change (at least in this specific time of

crisis[7]), with people becoming more self-centred (perhaps more individualistic) and less interested in getting involved in collective UOG management, as they were possibly absorbed by other, more substantial problems of daily living.

Variable code	Description	Values
Dependent variables		
C-KNOWN	Respondents' willingness to cooperate with people they know well in the collective management of UOG	Scale from 0 to 10, with 0 denoting no willingness and 10 denoting very high willingness to cooperate (see also Table 7)
C-ORGANIZED	Respondents' willingness to cooperate with organized groups in the collective management of UOG	Scale from 0 to 10. 0 denotes no willingness and 10 denotes very high willingness to cooperate (see also Table 7)
C-ALL	Respondents' willingness to cooperate with everybody in the collective management of UOG	Scale from 0 to 10. 0 denotes no willingness and 10 denotes very high willingness to cooperate (see also Table 7)
Explanatory variables		
AGE	Respondents' age in years	Continuous variable. The lowest age is 17 and the highest is 88 years (see also Table 1).
GENDER	Respondents' gender	Dummy variable. Values from 0 to 1. 0 denotes male and 1 denotes female (see also Table 1).
EDUCATION	Respondents' education level	Scale from 1 to 5. 1 is the lowest education level and 5 is the highest (see also Table 1).
INCOME	Respondents' income	Scale from 1 to 9. 1 is the lowest income level and 9 is the highest (see also Table 1).
FAMILY	Respondents' family status and household size	Dummy variable. Values from 0 to 1. 0 indicates households with no children and 1 households with children (see also Table 1).
USAGE	Frequency of UOG use	Scale from 1 to 7. 1 stands for daily use, 2 is "at least 3 times a week", 3 is "once a week", 4 is "twice a week", 5 is "once a month", 6 is "once in 6 months", and 7 is "rarely/never" (see also Figure 1).
UOG WELL-BEING	Respondents' assessment on whether UOG increases their well-being and the quality of urban life	Scale from 0 to 10. 0 refers to the lowest value (i.e. "not at all") and 10 to the highest (i.e. "very much") (see also Table 2).
LA CAPACITY	Respondents' assessment of the local authorities' capacity to efficiently manage UOG	Scale from 0 to 10. 0 refers to the lowest capacity and 10 refers to the highest (see also Table 4).
CITY COMMITMENT	Respondents' inclination to move away from Volos (to a different city)	Scale from 0 to 10. 0 refers to the lowest value (i.e. unlikely to happen) and 10 refers to the highest (i.e. very likely to happen) (see also Table 5).
INTERGENERATIONAL COMMITMENT	Respondents' assessment on whether their offspring would stay in Volos	Scale from 0 to 10. 0 refers to the lowest value (i.e. unlikely to happen) and 10 refers to the highest (i.e. very likely to happen) (see also Table 5).
INTERPERSONAL TRUST	Respondents' general level of trust	Scale from 0 to 10. 0 refers to a lack of interpersonal trust and 10 refers to the highest level (see also Table 6).
TRUST FRIENDS	Respondents' level of trust in friends	Scale from 0 to 10. 0 refers to a lack of trust and 10 to the highest level of trust (see also Table 6).
TRUST ORGANIZED GROUPS	Respondents' level of trust in organized groups	Scale from 0 to 10. 0 refers to a lack of trust and 10 to the highest level of trust (see also Table 6).
TRUST STATE	Respondents' level of trust in the state	Scale from 0 to 10. 0 refers to a lack of trust and 10 to the highest level of trust (see also Table 6).
CIVIC PARTICIPATION	Current membership in associations, cooperatives, clubs etc.	Dummy variable. Values from 0 to 1. 0 refers to non-participation and 1 refers to any kind of participation in associations, cooperatives, clubs etc.
TIME	Survey year	Dummy variable. Values from 0 to 1. 0 refers to the year 2012 and 1 refers to 2014.

Table 8: Variables used
Source: Authors' compilation.

[7] This is the period between January 2012 and January 2014, when, under the terms of the two international bailout programmes, eight austerity packages were implemented, resulting in a substantial reduction of public spending (through pension cuts, wage cuts and layoffs of public employees), rising unemployment and falling incomes, along with steep increases in both direct (property and income) and indirect taxes paid by households.

Explanatory variables:	MODEL 1 Dependent variable: C-KNOWN	MODEL 2 Dependent variable: C-ORGANIZED	MODEL 3 Dependent variable: C-ALL
AGE	0.0015	0.0061	0.0058
	(0.0050)	(0.0052)	(0.0051)
GENDER	0.2975 ***	0.2610 **	0.1726 *
	(0.1017)	(0.1018)	(0.1015)
EDUCATION	-0.1495 ***	-0.0353	-0.0904 *
	(0.0505)	(0.0505)	(0.0503)
INCOME	-0.0357	-0.0872 **	-0.0049
	(0.0361)	(0.0358)	(0.0358)
FAMILY	-0.1714	-0.3047 **	-0.3174 *
	(0.1386)	(0.1386)	(0.1384)
USAGE	-0.0352	-0.0109	-0.0175
	(0.0281)	(0.0282)	(0.0282)
UOG WELL-BEING	0.0873 ***	0.1259 ***	0.0205
	(0.0266)	(0.0261)	(0.0258)
LA CAPACITY	0.0116	-0.0243	-0.0214
	(0.0170)	(0.0173)	(0.0171)
CITY COMMITMENT	-0.0087	0.0046	9.44E-05
	(0.0158)	(0.0159)	(0.0158)
INTERGENERATIONAL COMMITMENT	0.0045	0.0095	0.0317
	(0.0190)	(0.0192)	(0.0193)
INTERPERSONAL TRUST	0.0048	0.0110	0.0532 ***
	(0.0182)	(0.0179)	(0.0179)
TRUST FRIENDS	0.3012 ***	0.1150 ***	0.0203
	(0.0262)	(0.0252)	(0.0245)
TRUST ORGANIZED GROUPS	0.0912 ***	0.2756 ***	0.1217 ***
	(0.0237)	(0.0247)	(0.0239)
TRUST STATE	-0.0181	0.0080	0.1094 ***
	(0.0265)	(0.0261)	(0.0269)
CIVIC PARTICIPATION	-0.0440	0.2500 *	0.5020 ***
	(0.1325)	(0.1339)	(0.1327)
TIME	-0.3065 ***	-0.1008	-0.2330 **
	(0.1085)	(0.1077)	(0.1075)
Model statistics			
N	1,976	1,976	1,976
McFadden Rsq	0.0403	0.0462	0.0227
LR stat.	217.1150	260.4257	132.8681
AIC	4.1636	4.3295	4.6008
SIC	4.2700	4.4360	4.7072

Table 9: Determinants of UOG collective governance
Source: Authors' calculation.

, ** and * indicate significance at the 0.1, 0.05 and 0.01 levels, respectively. Standard errors are given in parentheses.*

7 Concluding Remarks

The current paper defined UOG as an urban commons and explored the prospects of developing collective governance regimes for it, using Volos, a typical medium-sized Greek city, as a case study. In doing so, the paper examined how urban dwellers understand and value their greenspaces, whether they would be willing to participate in schemes of collective governance and if so, with whom, and what determinants (personal characteristics, stances, views etc.) affect such a decision. The discussion and findings reported herein allow some inferences to be drawn.

Under-investment in the provision and management of UOGs due to a lack of means and/or political will by the local authorities leads to their degradation, so new and innovative approaches are required. In addition, the saturated state of modern cities makes UOG an increasingly scarce CPR, forcing urban residents to either compete for it or find ways to jointly consume and protect it. The regime of common governance provides such an opportunity. What is required for its development is a strong community of local users and stakeholders who collectively create and enforce a system of institutional arrangements (within the given legislative framework) to regulate the appropriation and maintenance of the common resource. We identified two basic elements for such a process to be successful: social trust between the parties involved (users, authorities, institutions) and (transgenerational) dependence on the resource. Both ingredients seem to be missing in Volos, despite recent experiences with social movements and grassroots initiatives. This state of affairs may be attributable, among other things, to the lack of a deep culture of collaboration and civic engagement, and to people's adherence to traditional perceptions and schemes of public good provision. If this is the case, then there is certainly scope for public education to increase people's knowledge, awareness and understanding of the issues at stake.

Overall what comes to the fore is that a lack of trust- both among citizens and towards other interested parties including the state (both local and central)- is a serious obstacle to the development of user-based collective-action initiatives. This reflects a deficit in social vcapital, which raises doubts about whether all-citizen cooperation and participation can form the basis of successful collective governance structures (at least at this stage). Due to people's reluctance to get involved and invest in long-term relations and responsibilities with regard to the management and maintenance of UOGs, the most pragmatic solution, at least in the short or medium term for cases like Volos, would be the creation of an independent body that coordinates environmental organizations, informal citizen groups (e.g. networks of friends), technocrats-scientists, and, more generally, people with awareness and knowledge of the topic. Interestingly, other scholars have come to similar conclusions (see Colding et al. 2013; Shah and Garg 2017); they, too, report varying levels and forms of user involvement in governing the commons, depending on local conditions, preferences, experiences and culture. Future research should explore these issues more closely.

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References

Agrawal, Arun (2003): Sustainable Governance of Common-Pool Resources: Context, Methods, and Politics. Annual Review of Anthropology, 32: 243-262.

Arvanitidis, Paschalis/ Lanenis, Konstantinos/ Petrakos, George/ Psycharis, Yiannis (2009): Economic Aspects of Urban green space: a survey of perceptions and attitudes. Environmental Technology and Management, 11: 143-168.

Arvanitidis, Paschalis/ Nasioka, Fotini (2015): Urban Green Space as a Commons: Does Social Capital Matter? IASC Thematic Conference on Urban Commons, Bologna: IASC.

Arvanitidis, Paschalis/ Nasioka, Fotini/ Dimogianni, Sofia (2015): Water Resource Management in Larisa: a „Tragedy of the Commons?". In: Filho, Leal Walker/ Sumer, Vakur (eds.): Sustainable Water Use and Management: Examples of New Approaches and Perspectives, Springer: 65-89.

Baland, Jean-Marie/ Platteau, Jean-Philippe (1996): Halting Degradation of Natural Resources: Is There a Role for Rural Communities? Clarendon. Oxford.

Barclay, Pat (2004): Trustworthiness and Competitive Altruism can also Solve the "Tragedy of the Commons". Evolution and Human Behavior, 25: 209-220.

Baycan-Levent, Tuzin/ Vreeker, Ron/ Nijkamp, Peter (2009): A Multi-Criteria Evaluation of Green Spaces in European Cities. European Urban and Regional Studies, 16(2): 193-213.

Blomley, Nicholas (2008): Enclosure, Common Right and the Property of the Poor. Social Legal Studies, 17(3): 311-331.

Bollier, David/ Helfrich, Silke (eds.) (2012): The Wealth of the Commons: A World Beyond Market and State. Levellers. Amherst MA.

Briasouli, Eleni (2003): The Commons- Resources of Collective Ownership and Collective Responsibility: Concepts, Problems and the Question of their Management. Aeihoros, 2(1): 36-57 [in Greek].

Bromley, Daniel W. (1991): Environment and Economy: Property Rights and Public Policy. Oxford University Press. Oxford.

Colding, Johan/ Barthel, Stephan (2013): The potential of 'Urban Green Commons' in the resilience building of cities. Ecological Economics, 86: 156-166.

Colding, Johan/ Barthel, Stephan/ Bendt, Pim/ Snep, Robbert/ van der Knaap, Wim/ Ernstson, Henrik (2013): Urban green commons: Insights on urban common property systems. Global Environmental Change, 23(5): 1039-1051.

Coleman, James S. (1990): Foundations of Social Theory. Harvard University Press, Cambridge, MA.

De Angelis, Massimo (2007): The Beginning of History: Value Struggles and Global Capital. Pluto, London.

Delhey, Jan/ Newton, Kenneth (2003): Who Trusts? The origins of social trust in seven societies. European Societies, 5(2): 93-137.

Demsetz, Harold (1967): Towards a theory of property rights. American Economic Review, 57(2): 347-359.

ELSTAT - Hellenic Statistical Authority (2014): Demographic and social characteristics of the Resident Population of Greece according to the 2011 Population- Housing Census revision of 20/3/2014, press release of 12 September 2014.

Ernstson, Henrik/ Sorlin, Sverker/ Elmqvist, Thomas (2008): Social Movements and Ecosystem Services- The Role of Social Network Structure in Protecting and Managing Urban Green Areas in Stockholm. Ecology and Society, 13(2): 39. URL: http://www.ecologyandsociety.org/vol13/iss2/art39/ (28.11.2016).

Foster, Sheila (2012): Collective Action and the Urban Commons. Notre Dame Law Review, 87(1): 57-133.

GreenKeys (2008): Urban Green as a Key for Sustainable Cities. European Union and German Federal Ministry of Transport, Building and Urban Affairs. Berlin.

Hardin, Garrett (1968): The Tragedy of the Commons. Science, 162: 1243-1248.

Harvey, David (2003): The New Imperialism. Oxford University Press, Oxford.

Harvey, David (2012): Rebel Cities: from the Right to the City to the Urban Revolution. Verso, London.

Huron, Amanda (2015): Working with Strangers in Saturated Space: Reclaiming and Maintaining the Urban Commons. Antipode, 47(4): 963-979.

Jones, Nikoleta/ Malesios, Chrisovalantis/ Iosifides, Theodoros/ Sophoulis, Costas M. (2008): Social Capital in Greece: Measurement and Comparative Perspectives. South European Society and Politics, 13(2): 175-193.

Klein, Naomi (2001): Reclaiming the Commons. New Left Review, 9(3): 81-89.

Libecap, Gary (2009): The Tragedy of the Commons: Property Rights and Markets as Solutions to Resource and Environmental Problems. Australian Journal of Agricultural and Resource Economics, 53(1): 129-144.

Lo, Alex Y.H./ Jim, C.Y. (2012): Citizen Attitude and Expectation Towards Greenspace Provision in Compact Urban Milieu. Land Use Policy, 29(3): 577-586.

Lowen, Mark (2012): Greece Bartering System Popular in Volos. BBC Europe, News. 12 April 2012. URL: http://www.bbc.com/news/world-europe-17680904 (10.3.2017).

Matsaganis, Manos (2013): The Greek Crisis: Social Impact and Policy Responses. Berlin, Friedrich-Ebert-Stiftung.

Matsaganis, Manos/ Leventi, Chrysa (2014): Poverty and Inequality During the Great Recession in Greece. Political Studies Review, 12(2): 209-223.

Moss, Timothy (2014): Spatiality of the Commons. International Journal of the Commons, 8(2): 457-471.

Municipality of Volos (2006): Strategic Development Plan of Volos 2006. University of Thessaly and Municipality of Volos, Volos [in Greek].

Newton, Ken/ Zmerli, Sonja (2011): Three Forms of Trust and their Association. European Political Science Review, 3(2): 169-200.

Ntouros, George (2001): Urban- Peri-urban Green. Observatory of Open Spaces. URL: http://www.asda.gr/elxoroi/ntouros.htm (28.11.2016) [in Greek].

O'Brien, Daniel Tumminelli (2012): Managing the Urban Commons. Human Nature, 23(4): 467-489.

Ostrom, Elinor (1990): Governing the Commons: the evolution of institutions for collective action. Cambridge University Press. New York.

Ostrom, Elinor (1992): Community and the Endogenous Solution of Commons Problems. Journal of Theoretical Politics, 4(3): 343-351.

Ostrom, Elinor (1999): Coping with Tragedies of the Commons. Annual Review of Political Science, 2: 493-535.

Ostrom, Elinor (2000): Reformulating the Commons. Swiss Political Science Review, 6(1): 29-52.

Ostrom, Elinor (2006): The Value-Added of Laboratory Experiments for the Study of Institutions and Common-Pool Resources. Journal of Economic Behavior and Organization, 61: 149-163.

Ostrom, Elinor (2008): The Challenge of Common-Pool Resources. Environment: Science and Policy for Sustainable Development, 50(4): 8-20.

Ostrom, Elinor (2010): Analyzing Collective Action. Agricultural Economics, 41(S1): 155-166.

Ostrom, Elinor/ Ahn, T-K. (eds.) (2003): Foundations of Social Capital. Edward Elgar, Cheltenham, UK.

Ostrom, Elinor/ Burger, Joanna/ Field, Christopher/ Norgaard, Richard/ Policansky, David (1999) Revisiting the Commons: Local Lessons, Global Challenges. Science, 284: 278-282.

Ostrom, Elinor/ Walker, James/ Gardner, Roy (1992): Covenants With and Without a Sword: Self-Governance is Possible. American Political Science Review, 86(2): 404-417.

Paldam, Martin (2000): Social Capital: One or Many? Definition and Measurement. Journal of Economic Surveys, 14(5): 629-653.

Paraskevopoulos, Christos J. (2006): Social Capital and Public Policy in Greece. Science and Society, 16: 69-105 [in Greek].

Putnam, Robert D. (1995): Tuning in, Tuning out: The Strange Disappearance of Social Capital in America. Political Science and Politics, 28(4): 664-683.

Rohring, Andreas/ Gailing, Ludger (2005): Institutional Problems and Management Aspects of Shared Cultural Landscapes: Conflicts and Possible Solutions Concerning a Common Good from a Social Science Perspective. Working Paper, Leibniz Institute for Regional Development and Structural Planning.

Shah, Arpit/ Garg, Amit (2017): Urban Commons Service Generation, Delivery, and Management: A Conceptual Framework. Ecological Economics, 135: 280-287.

Stern, Paul C./ Dietz, Thomas/ Ostrom, Elinor (2002): Research on the Commons: Lessons for Environmental Resource Managers. Environmental Practice, 4(2): 61-64.

Streinzer, Andreas (2014): The Real Utopia of Currency in Greece. Exchange, Distribution and the Value(s) of Currency in Volos. Paper presented at the XVIII ISA World Congress of Sociology, Yokohama, Japan, July 13-19, 2014.

Swanwick, Carys/ Dunnett, Nigel/ Woolley, Helen (2003): Nature, Role and Values of Green Space in Towns and Cities: An overview. Built Environment, 29(2): 94-106.

Taylor, Lucy/ Hochuli, Dieter F. (2017): Defining Greenspace: Multiple Uses across Multiple Disciplines. Landscape and Urban Planning, 158: 25-38.

Wade, Robert (1988): Village Republics: Economics Conditions for Collective Action in South India. ICS Press. Oakland.

Wolch, Jennifer R./ Byrne, Jason/ Newell, Joshua P. (2014): Urban Green Space, Public Health, and Environmental Justice: The Challenge of Making Cities 'Just Green Enough'. Landscape and Urban Planning, 125: 234-244.

Worrell, Richard/ Appleby Michael C. (2000): Stewardship of natural resources: definition, ethical and practical aspects. Journal of Agricultural and Environmental Ethics, 12(3): 263-277.