

Urban green space as a commons: does social capital matter?

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Abstract

Common pool resources, or commons, are natural or artificial resources which due to non-excludability and rivalry in their consumption face serious risks of overexploitation, mismanagement and degradation, leading, in some cases, to total destruction; a situation known as “the tragedy of the commons”. The tragedy can be avoided with the provision of an appropriate governance regime that assigns clear, exclusive and secured property rights on the resource, giving the owners the incentives and authority to enforce its sustainability. Three such governance regimes have been identified in the literature: privatisation, nationalisation and community-based management, with the last one to gain increased popularity due to its capacity for increased equity, democracy, local empowerment and community bonding.

This research comes to define urban green space as an urban commons and to explore empirically the possibility of its collective management, using Volos city, one of the major urban areas in Greece, as a case study. A survey of more than two thousand people has been conducted for this purpose, which examines, *inter alia*, the condition and qualities of urban green space, the preferred allocation of property rights on the resource, and the willingness of users to collaborate towards the sustainable management of urban green. The results indicate that users are rather reserved towards this end, something which is attributed to the lack of trust both among them and towards state authorities and institutions.

Key words: urban green spaces, commons, property rights, trust, social capital, Volos, Greece.

1. Introduction

The rapid urbanization of the last decades and the increased population density of urban centres, had a significant effect on urban natural environment causing many problems to modern cities, both environmental and social. Urban green spaces (UGS) have a key role to play in addressing those problems, since they are not only the “lungs” of the cities, but also places for healthy socialisation (Swanwick *et al.*, 2003). The protection and efficient management of UGS, therefore, becomes important and constitutes high priority in countries like Greece, which exhibit one of the lowest level of UGS per inhabitant in Europe (Ntouros, 2001; Arvanitidis and Ntontou, 2011). In addition, the reduction of resources available for UGS on the part of local authorities, in conjunction with the financial crisis the country faces, make it necessary to explore new and more innovative ways for UGS management and protection.

In this context, this research comes to define UGS as a common pool resource and to explore creative ways for their management and sustainable development. Using primary data through a survey conducted in the city of Volos (one of the top five most populated urban areas in Greece), the paper examines the views of citizens regarding the condition and qualities of UGS, as well as the possibility for bottom-up management, focusing on issues related to the funding of UGS, the preferred allocation of property rights on the resource to various stakeholders (authorities,

organisations, community and individuals), the social relations between users and their willingness to get involved in some kind of collective management.

The paper is structured as follows. The following section defines common pool resources and discusses issues of collective action and sustainable management. Section three identifies UGS as a common pool resource and section four presents briefly the key characteristics of Volos's UGS. The fifth and sixth sections outline the research methodology and the results of the analysis conducted, respectively. Finally, section seven concludes highlighting the key outcomes emerged.

2. The Commons and their Management

The common pool resources (CPR), or commons, is 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 someone 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, that is disregarding the social, long-term costs from overuse (Bromley, 1991; Stevenson, 1991). As a result, the resource is gradually depleted and eventually led to degradation and destruction, a situation known as "the tragedy of the commons" (Hardin, 1968).

Possible solutions to the tragedy could be to infuse stewardship ethic among users and to enhance moral and altruistic behaviour toward sustainability (Worrell and Appleby, 2000; Barclay, 2004), or/and, as Hardin (1968) and others (e.g. Demsetz, 1967; Libecap, 2009) have highlighted, to attribute clearly defined property rights, either to individuals or to the state, giving the owner incentives and authority to enforce the sustainability of the resource.

However, Hardin's solutions have been criticized on the basis that they restrict the rights and actions of the real users destroying the social relations (social capital) that characterize local society, to the detriment of both the local community and the long-term efficiency of the resource. Main 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 other scholars (such as Wade, 1987; Ostrom *et al.*, 1992; Stern *et al.*, 2002; Dietz *et al.*, 2003; Bollier and Helfrich, 2012; Colding *et al.*, 2013) demonstrated that communities can successfully manage commons by themselves, even in the absence of private property rights and a strong regulatory authority.

As a result, a third, more socially acceptable, management option emerges, where the users themselves overcome collective action problems and form strong and stable institutions for the sustainable management of their CPR. These institutions are particular social/informal arrangements (rules, norms, practices, etc.), which define and allocate rights and obligations among involved parties and provide the mechanisms for policing, enforcement and conflict resolution.

In addition this literature (*inter alia*: Wade, 1987, 1988; Ostrom, 1990, 2006; Baland and Platteau, 1996; Ostrom *et al.*, 1999; Agrawal, 2001, 2003; Briasouli, 2003; Arvanitidis *et al.*, 2015) has identified a number of characteristics that are common to all such management regimes. These can be organized under five headings. The first concerns the resource itself; resources, for example, of small size with definable boundaries can be preserved more easily. A second group refers to the characteristics of the users; small and homogeneous populations with a thick social network based on trust, with solid social values and with experience in self-regulation do better. The third group of conditions concentrates on the relationship between users and the resource; there must be a perceptible threat of resource depletion, the community (current and future generations) should depend to a high degree on the resource for its living, and it should locate close to it. The fourth group refers to the governance structure, that is, the institutional arrangements that should be developed to manage the CPR; locally-emerged, user-based, simple rules with simple, internal, accountable and low-cost policing and enforcement procedures are preferable. Finally the last group

concerns the external environment; clear and supportive state regulations (with formal incentives and sanctions), and accommodating local/regional authorities do help to a great extent.

3. Urban Green Space as a Commons

Over the years, several definitions have been given to describe what UGS is. Perhaps the most widely accepted is this of Levent *et al.* (2009, p.195) who view UGS as “*public and private open spaces in urban areas, primarily covered by vegetation, which are directly or indirectly available for the users*”. As such, UGS include parks, squares, play-yards, land trusts (school and church grounds, vacant plots, gardens, etc.) and other recreation spaces (Briasouli, 2003). UGS are of vital importance for the quality of life in cities, providing not only ecological, but also aesthetical, social and economic benefits (Swanwick *et al.*, 2003; Arvanitidis *et al.*, 2009).

UGS constitutes a special case of CPR (Briasouli, 2003; Colding and Barthel, 2013; Colding *et al.*, 2013). Being an open public space means that it is not possible to exclude people from using it (non-excludability), whereas use by some reduces the quantity/quality available to others (rivalry). In addition, the increase of the urban population worldwide (urbanization), the high pressure that the urban open space faces from real estate developers, the under-investment (due to lack of resources and/or political will) on urban green provision and maintenance by local authorities, and the environmental degradation cities are facing, lead to the decline of urban green, requiring new and innovative ways for its management so that the ‘tragedy’ to be avoided.

4. Urban Green Space in Volos city

Volos city is the capital of Magnesia prefecture and one of the five largest Greek cities with population over 140.000 residents (ELSTAT, 2014). Volos has a positive population growth rate¹ accommodating a number of secondary and tertiary economic activities, including tourism and tertiary education (it houses the University of Thessaly).

The city’s green space constitutes only the 5% of its total area (Karioti, 2009). The percentage of UGS per inhabitant is 6.4 m² (Greenkeys, 2008), which is too low as compared to those of other European cities of similar size, as well as to the European standard². As regards the distribution of UGS, most of them are located along the coast (except from the Municipal Cultural Park of Nea Ionia at the northeast), whereas the rest of the city suffers from lack of adequate such spaces (Municipality of Volos, 2006; Karioti, 2009). Although there are small parks scattered all over the city, these do not meet the standards that modern cities should follow (Greenkeys, 2008). The figure below (Figure 1) shows the distribution of the existing UGS in the city.

The quality of Volos’s UGS is quite low too. This is due to the limited and reducing resources of the local authorities and the absence of a long-term UGS strategy on the part of the municipality, which enable only the most essential works to be carried out, whereas acts of vandalism and littering are highly visible (Greenkeys, 2008; Arvanitidis and Ntontou, 2011).

Overall, UGS in Volos are low in quantity and quality, are concentrated and without cohesion, and enjoy medium levels of maintenance and care.

¹ Population growth rate during the last two decades is almost 8% (1991-01) and 15% (2001-11).

² The European Environment Agency acknowledges that UGS per inhabitant should extend beyond 9 m² for cities to be sustainable. UGS 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.

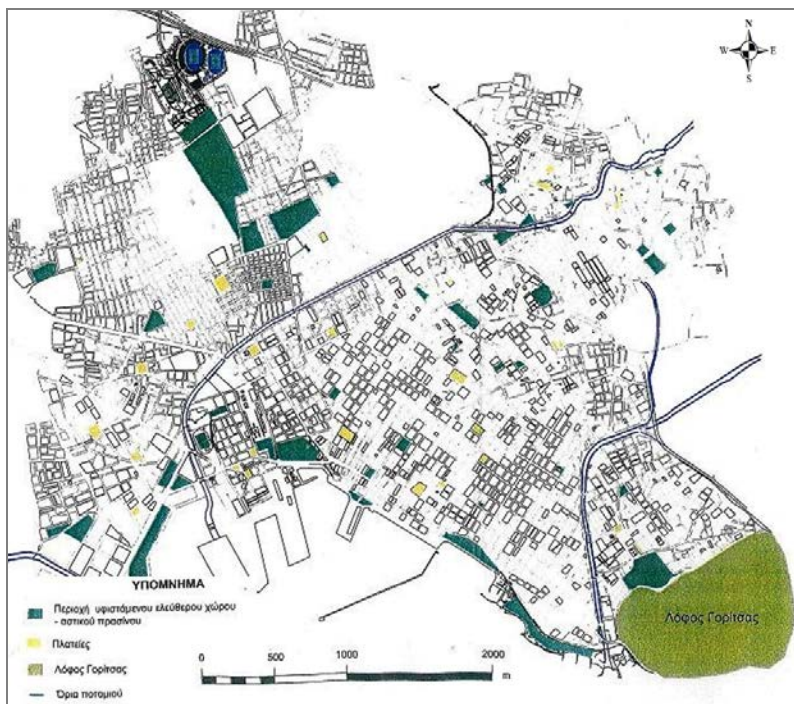


Fig. 1. UGS in the city of Volos
Source: Karioti (2009, p. 137)

5. Research Concept and Methodology

The previous section made evident the problems UGS in Volos encounter (in terms of shortage of both quantity and quality), highlighting the inability of the state to adequately address the issue. The research we conducted explored citizens' views on UGS and the possibility of user-based management towards sustainable maintenance and management of the resource. This was done through a survey, which, using structured interviews in the form of a questionnaire, examined the views and attitudes of the users on a number of relevant issues, such as: the condition of the resource, the willingness to pay for its management and maintenance, the intensity of use and the degree of citizens' dependence on the resource, the quality of social capital and the willingness of the citizens to be engaged in some form of bottom-up, user-based initiatives toward the sustainable management of UGS.

The questionnaire used consists of five parts containing 22 questions of all types: measurement, dichotomous, ordinal, as well as Likert-scale and semantic-differential ones scaled from 0 (denoting strong disagreement, negative opinion, etc.) to 10 (denoting strong agreement, positive opinion, etc.). The first part informs the respondents on the purpose of the research and ensures the anonymity of participation. The second part records views regarding the condition of UGS (adequacy, quality, accessibility, etc.) and the dependence of citizens on the resource. The third part records views regarding: the willingness of users to contribute financially to the maintenance of UGS, the capability of various stakeholders to efficiently manage the UGS, and the preferred allocation of property rights on the resource. The fourth part examines users' social capital and their attitude toward cooperation for self-governance of the UGS. The final part of the questionnaire gathers information about the respondents, such as age, gender, and education. Survey questions were pre-tested in a pilot study enabling fine-tuning of the instrument.

The survey was conducted in January 2013 and was repeated a year after, in January 2014. The interviews took place in the city's UGS and questionnaires were completed on the spot by the members of the research team. Questionnaires were collected, validated, and then coded and analysed to generate a number of statistics illustrating the respondents' views on the issues raised.

6. Analysis

6.1. Composition of respondents

A total of 2.130 validated questionnaires were collected. Gender composition of the total sample was about 50% male and 50% female (see Table 1), highlighting the fact that urban green space is used equally by both sexes. The average age of the sample was about 34 years and the '21 - 40' age bracket was the main group (56.7%), followed by the '41-60' (25.8%) and those 'below 20' (13.7%). The majority of the respondents holds a university degree (43.9%) followed by those that have completed secondary studies (26.1%). As regards household income, most respondents earn between 1000€ to 1500€, followed by those of 1500-2000€. Overall, the average user is a mature adult with a high educational level and medium to low household income.

Table 1. Composition of respondents

		Distribution (%)	N	M	S.D.	Median	Percentiles		
							25	50	75
Gender	Male (1)	49.2	2127	1,5	0,5	2	1	2	2
	Female (2)	50.7							
Age (years)	up to 20	13.7	2123	33.73	13.38	31	23	31	43
	21-40	56.7							
	41-60	25.8							
	above 60	3.8							
Education	Primary or less (1)	8.8	2123	3.16	1.16	4	2	4	4
	Secondary (2)	26.1							
	Post-secondary (3)	12.9							
	Tertiary (4)	43.9							
	Postgrad (5)	8.0							
Monthly household income (€)	Up to 300 (1)	4.4	2123	4.2	1.5	4	3	4	5
	301-500 (2)	6.7							
	501-1.000 (3)	22.2							
	1.001-1.500 (4)	28.1							
	1.501-2.000 (5)	20.9							
	2.001-3.000 (6)	11.7							
	3.001-5.000 (7)	4.0							
	5.001-10.000 (8)	1.2							
	above 10.000 (9)	0.9							

6.2. The condition of UGS

Firstly respondents were asked to evaluate the adequacy, accessibility and quality (care and effective management) of the existing UGS (see Table 2). As becomes evident from Table 2, respondents recognize the lack of urban green in the city of Volos (mean value of 4.6), its inefficient management (mean value of 3.6) and care by the users (mean value of 3.8). They also regard that UGS enjoy relatively good accessibility (mean value of 5.8). Overall answers indicate that the citizens are not very pleased with the quality of UGS in their city.

The previous findings are also supported by the answers to the next two questions attempted to assess: the necessity of qualitative improvement of UGS and the UGS contribution level to the welfare of the city. In particular, respondents regard that qualitative improvement of UGS is necessary (mean value of 8.2) and that this will improve people's welfare and quality of life in general (mean value of 8.3).

Table 2. Condition of UGS

	0	1	2	3	4	5	6	7	8	9	10	N	M	SD	Median	Percentiles		
	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)					25	50	75
Adequacy	3.4	4.1	9.4	15.7	18.3	17.8	11.3	9.3	5.0	2.8	2.5	2127	4.6	2.2	4	3	4	6
Accessibility	1.7	3.2	6.2	7.8	10.1	15.2	12.0	15.2	13.5	9.3	5.4	2123	5.8	2.5	6	4	6	8

Care	8.6	12.2	12.6	13.6	15.4	16.4	7.6	5.8	4.1	1.7	1.7	2127	3.8	2.4	4	2	4	5
Management	10.7	12.8	14.3	12.2	14.6	16.6	6.1	4.6	3.9	2.3	1.6	2123	3.6	2.5	3	2	3	5
Qualitative improvement is necessary	0.8	0.5	0.7	1.5	2.8	5.7	6.5	11.5	16.2	17.5	36.3	2128	8.2	2.0	9	7	9	10
Contribute to welfare	0.7	0.6	1.0	1.4	2.3	5.8	5.4	9.2	15.4	21.0	37.0	2124	8.3	2.0	9	7	9	10

6.3. Financial contribution of citizens and willingness to pay

Given the chronic underfunding of UGS on the part of municipality (Greenkeys, 2008), the next questions which explore whether the respondents are willing to contribute financially toward the maintenance of the city's UGS, are of particular interest. Three questions were asked: whether respondents are keen to support financially the improvement and provision of UGS, what is the preferred way for financial contribution, and what amount of money they are willing to contribute on a monthly basis for the qualitative and quantitative improvement of UGS.

Interestingly it seems that respondents are divided on whether the citizens should contribute financially toward UGS provision and improvement (see Table 3). Though the vast majority of the respondents (33.2%) were quite positive, a 23.2% of them were negative and the rest 27.8% were indecisive. As regards the appropriate way for financial contribution, the 32.2% of the respondents answered that it should be based on the households income, 23.6% opt for a fixed amount, 17.4% said that it should be related to the degree of use (visits) and 13.5% that it should be based on proximity (see Table 4). In addition, a part of the sample (13.0%) differentiated from existing options arguing that existing charges are sufficient, and that the state is responsible for the improvement of existing UGS.

Table 3. Financial contribution of citizens

Table 5: Financial Contribution of Citizens											N	M	SD	Median	Percentiles		
0(%)	1(%)	2(%)	3(%)	4(%)	5(%)	6(%)	7(%)	8(%)	9(%)	10(%)					25	50	75
0: strongly disagree										10: strongly agree							
13.4	3.9	5.9	5.4	4.7	15.0	8.1	10.5	11.0	7.3	14.9	2129	5.5	3.3	6	3	6	8

Table 4. Proper way of financial contribution towards the maintenance of UGS

based on income	fixed amount	based on use (visits)	based on proximity	other: existing local taxes are enough	N
32.2 %	23.6 %	17.4 %	13.5 %	13.0 %	2120

The previous findings are also supported by the answers to the next question regarding the willingness of the respondents to contribute financially toward the maintenance of the resource (see Table 5). As can be seen, 20.0% of the respondents were not willing to provide any financial support. The rest of the respondents were willing to contribute offering even a small amount of money, with the vast majority (27.4%) to be willing to offer 5€ monthly, whereas some respondents (a 6.7% of the sample) did not hesitate to offer amounts over 20€. On average respondents were willing to contribute 11.7€ towards the improvement of UGS in their city.

Table 5. Willingness to pay monthly (€)

0	≤2	≤5	≤10	≤15	≤20	≤30	≤50	> 50	N	M	SD
20.0 %	13.2 %	27.4 %	22.5 %	3.1 %	7.1 %	2.1 %	3.2 %	1.4 %	2236	11,7	16,8

6.4. Allocation of property rights

A number of questions explored the views and attitudes of the respondents regarding the (re-)configuration of the property rights toward provision and financing of UGS. In particular, we asked whether citizens would be willing to accept, first, the introduction of entrance fee if successful

policing, maintenance and overall improvement of UGS is achieved, second, the introduction of controlled access if prevention of vandalism and degradation of UGS is achieved, third, the allocation part of UGS to other friendly (but profitable) uses if this provides necessary funding for their improvement, and finally, allocation of property rights to groups of citizens (i.e. environmental organizations, associations, schools) if this contributes to successful policing, maintenance and improvement of UGS.

As Table 6 reveals, the respondents were particularly negative to the idea of entrance fees as a means for qualitative improvement of UGS (mean value of 3.5), whereas they had a rather positive stance to the proposal for controlled access in order to prevent extensive acts of vandalism and degradation (mean value of 6.5). As regards the possibility of UGS financing through the assignment of property rights to friendly/profitable uses, the respondents were rather positive (mean value of 6.3). Similar were their answers regarding assignment of property rights to groups of citizens for maintenance reasons (mean value of 5.7).

Table 6. Views and attitudes on UGS issues

0(%)	1(%)	2(%)	3(%)	4(%)	5(%)	6(%)	7(%)	8(%)	9(%)	10(%)		N	M	SD	Median	Percentiles		
0: strongly disagree																25	50	75
10: strongly agree																		
Introduction of entrance fee if successful policing, maintenance and improvement of UGS is achieved:																		
32.4	7.2	7.8	7.1	4.9	13.5	5.6	6.1	5.3	2.8	7.4		2129	3.5	3.3	3	0	3	6
Introduction of controlled access if prevention of vandalism and degradation of UGS is achieved:																		
7.9	2.4	3.7	4.0	4.2	12.1	7.9	11.9	13.4	9.5	22.9		2128	6.5	3.1	7	5	7	9
Allocation of property rights to other 'friendly' uses if this provides necessary funding for the improvement of UGS:																		
6.4	1.5	3.2	4.2	5.6	16.2	10.8	15.1	15.5	6.8	14.6		2127	6.3	2.8	7	5	7	8
Allocation of property rights to groups of citizens (i.e. environmental organizations, schools) if this contributes to successful policing, maintenance and improvement of UGS:																		
11.2	3.2	5.6	5.4	4.8	15.1	9.0	11.5	11.8	6.9	15.4		2128	5.7	3.2	6	3	6	8

In the next question the respondents were asked to assess the degree of capability of various stakeholders/entities to manage the resource, in order for sustainability to be achieved (see Table 7). These were: central state, local authorities, specialized management bodies, environmental groups/organizations, organized group of citizens, all citizens, and private investors. The respondents regard that local authorities and environmental organizations are the more capable to manage efficiently the UGS (mean value of 7.4 and 7.2 respectively), followed by, local organized group of citizens (mean value of 6.6), specialized management organization (mean value of 6.3) and all citizens together (mean value of 6.1). They express doubts regarding the effectiveness of central state (mean value of 5.7), while private investors considered to be less appropriate (mean value of 4.6).

Summarizing the findings, there is a positive attitude toward management by citizen groups, either environmental or local, whereas both central state's (nationalization) and private sector's (privatization) capacity is called in question. Regarding the possibility of UGS self-management, the respondents are rather reserved and uncertain.

Table 7. Efficient management of UGS

	0	1	2	3	4	5	6	7	8	9	10		N	M	SD	Median	Percentiles		
	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)						25	50	75
Central state	13.1	4.6	6.9	5.4	5.0	10.3	6.7	8.7	9.3	7.2	22.2		2119	5.7	3.5	6	3	6	9
Local authorities	4.7	2.3	3.6	4.1	3.4	7.7	5.2	7.3	12.0	13.4	36.0		2124	7.4	3.0	8	5	8	10
Specialized bodies	8.2	1.8	4.3	4.6	4.1	13.5	8.8	12.6	15.8	10.4	15.2		2112	6.3	3.0	7	5	7	9
Environmental organizations	3.0	0.6	1.4	2.2	2.8	10.9	10.5	16.2	19.7	11.3	21.0		2120	7.2	2.4	8	6	8	9
Organized citizens	4.4	0.9	3.0	4.2	5.3	13.5	12.3	15.0	16.9	9.2	15.0		2121	6.6	2.6	7	5	7	8

All citizens	8.2	2.6	4.6	4.7	5.6	13.9	9.1	11.2	13.8	7.8	18.1	2120	6.1	3.1	7	4	7	9
Private investors	21.7	3.8	5.9	6.5	6.2	13.2	8.9	8.2	9.7	5.7	9.3	2114	4.6	3.4	5	1	5	7

6.5. UGS as a commons

The current section investigates the possibility of developing some bottom-up initiatives toward the sustainable management and improvement of UGS. This is done through a set of questions which explore the degree of dependence of users on the resource, the level of trust and the quality of citizens' social capital, and, finally, the willingness to cooperate with others toward self-governance of UGS as commons.

Four questions were set to assess the dependence of citizens on UGS and the city in general. The first question explored the frequency of UGS use. As Table 8 reveals, although there is a percentage of respondents who rarely use UGS (10.4%), more than 50% of the respondents visit UGS at least once a week, and over 80% at least once a month. The second question explored whether the respondents, *ceteris paribus*, would consider moving to another city. In this question the respondents appeared divided (see Table 9): a significant part of the sample (28.6%) would not consider moving (14.4% picked the lowest point), whereas 29.6% of the respondents would consider moving if conditions allowed this (the 27.5% remained indecisive). Finally, to assess the long-term citizens bonding with the city, the respondents were asked whether they believe their off-springs would stay in Volos (see Table 9). One in four respondents answered that off-springs will stay in their city, with the majority of the respondents placed on the middle or on the negative end of the scale (40.4% and 19.8% respectively). Overall, it became evident that citizens depend on UGS to some extent and that appropriation of UGS constitutes an integral part of living in Volos. However, the lack of bonding with the city in long-term raises questions whether the citizens would be willing to engage themselves and invest in long-term relations in order to manage and maintain its UGS.

Table 8. Frequency of UGS use

Daily (1)	At least 3 times weekly (2)	Once a week (3)	Twice a month (4)	Once a month (5)	Once in six months (6)	Rarely/ never (7)	N	M	Percentiles		
									25	50	75
10.5%	22.2%	25.2%	11.8%	11.6%	8.0%	10.4%	2124	3,6	2	3	5

Table 9. Relation with the city

	0 (%)	1 (%)	2 (%)	3 (%)	4 (%)	5 (%)	6 (%)	7 (%)	8 (%)	9 (%)	10 (%)	N	M	SD	Median	Percentiles		
																25	50	75
Consider moving	14.4	7.1	7.1	7.1	6.9	13.4	6.4	7.7	10.0	7.0	12.6	2126	5.0	3.4	5	2	5	8
Off-springs continue staying in the city	9.3	4.4	6.1	5.4	6.2	26.3	7.9	9.4	11.2	6.5	6.9	2119	5.2	2.8	5	4	5	7

The next two questions were set to assess the quality of citizens' social relations and trusting behaviour (a form of social capital), which constitute essential factor for breeding cooperation in collective-action situations. First, the trusting attitude of respondents was measured using a semantic-differential question with the following contrasting options: "I do not trust someone until there is clear evidence that (s)he can be trusted," indicating low trusting behaviour (scored 0), and "I trust someone until there is clear evidence that (s)he cannot be trusted," indicating high trusting behaviour (scored 10). Table 10 presents the results making apparent the lack of trust (and, thus, the social capital deficit) that characterizes the citizens in Volos. In particular, 38.5% of respondents described themselves as rather reserved and suspicious (14.3% picked the lowest point in the scale),

35.8% placed themselves on the middle of the scale, and only a low 25.5% put themselves on the high end of the trusting 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 on various people/entities: friends, neighbours, fellow citizens, organized citizen groups, technocrats/scientists, local authorities and central state. As Table 10 reveals, friends is the most trustworthy group (mean value of 7.6), whereas, generally, it can be observed that 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 toward state, both at the central and local level. The above findings are also consistent with several other pieces of research, that make apparent the low and declining levels of social trust and lack of social capital that characterizes Greece (Paraskevopoulos, 2007; Arvanitidis *et al.*, 2015).

Table 10. Social capital - Trust

	0	1	2	3	4	5	6	7	8	9	10	N	M	SD	Median	Percentiles		
	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)							
	0: Not trust										10: Trust					25	50	75
Trusting attitude	14.3	7.0	9.1	8.1	10.0	18.2	7.6	8.2	8.3	3.9	5.1	2126	4.4	2.9	5	2	5	7
Friends	0.9	1.0	1.9	1.7	3.6	8.6	6.2	14.0	22.6	22.0	17.3	2126	7.6	2.2	8	7	8	9
Neighbours	7.4	6.2	9.2	10.7	12.1	19.1	14.3	10.3	6.1	2.5	1.9	2127	4.5	2.4	5	3	5	6
Fellow citizens	8.5	8.7	11.6	13.1	14.3	21.2	9.8	6.9	3.6	1.5	0.5	2127	3.9	2.3	4	2	4	5
Organized citizen groups	7.3	6.8	9.8	11.1	12.3	21.3	11.3	8.7	6.9	2.7	1.6	2127	4.4	2.4	5	3	5	6
Technocrats/scientists	9.7	6.3	8.1	7.7	9.6	19.9	10.1	11.4	9.6	4.7	2.6	2124	4.7	2.7	5	3	5	7
Local authorities	23.8	16.6	15.4	11.3	8.6	12.3	4.8	3.9	1.5	1.1	0.5	2125	2.6	2.3	2	1	2	4
Central state	43.8	16.9	11.2	8.2	5.9	7.6	2.6	1.5	1.1	0.4	0.6	2128	1.7	2.1	1	0	1	3

Finally, it has been examined whether respondents had previous cooperative experience and how willing they would be to cooperate with other citizens toward self-governance of UGS. As regards the former, only a small part of the respondents (17.0%) reported that they participate in associations, cooperatives, clubs, etc., something which is in accordance with the previous finding regarding trust. Of them, 54.3% report that they take part in one such organization, 29.4% in two, and the rest in three or more. The average experience in such organisations is something greater to 6 years of involvement.

As concerns their attitude toward cooperation for self-governance of UGS, 69.6% of the respondents were rather positive to cooperate with persons they know quite well (whereas 9.3% were reserved), 54.4% were positive to join forces with organized groups (associations, cooperatives, etc.) (whereas 13.8% were rather reserved), 50.3% were positive to cooperate with scientists (whereas 17.9% were sceptical), but only 28.8% were happy to work together with all interested parties, in contrast to 36.8% who were unwilling (see Table 11), indicating, once more, the low level of trust among citizens in general.

Table 11. Attitude toward self-governance of the UGS as a commons

Cooperation with:	0	1	2	3	4	5	6	7	8	9	10	N	M	SD	Median	Percentiles		
	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)							
	0: No										10: Yes					25	50	75
..citizens I know well	3.2	1.4	2.4	2.3	3.1	10.3	7.7	14.4	18.6	17.9	18.7	2101	7.1	2.5	8	6	8	9
..organized citizens groups	3.8	2.3	3.5	4.2	5.8	13.4	12.6	15.9	16.9	11.6	10.0	2100	6.4	2.6	7	5	7	8
.. Technocrats/ scientists	5.9	3.5	4.5	4.0	5.7	15.4	10.7	12.4	16.2	11.4	10.3	2100	6.1	2.8	7	5	7	8
.. all citizens	13.2	8.5	7.2	7.9	7.4	17.9	9.0	7.9	7.3	5.8	7.8	2103	4.6	3.1	5	2	5	7

7. Conclusions

UGS constitutes a typical case of urban commons that faces serious risk of mismanagement, degradation (both in terms of quality and quantity), and even destruction (the so-called “tragedy of the commons”). The conventional literature prescribed as appropriate solutions to the problem either privatization or nationalization of the resource. However, many countries (such as Greece to some extent) exhibit a number of characteristics (e.g., not clearly defined and reliable private property rights, deficient policing and enforcement mechanisms, rigid and bureaucratic institutions, limited financial capability of local authorities, etc.), which preclude successful implementation of such governance structures. On the other hand, as Elinor Ostrom and other scholars have established, the users themselves can develop collective institutional arrangements (more socially acceptable and with lower implementation costs) which enable them to ensure proper use and longevity of the managed resource.

Drawing on the analytical framework developed by Ostrom, the current paper has examined UGS management issues, using the city of Volos (one of the five largest Greek urban centres) as a case study. Issues examined include the condition of UGS, the possibilities of funding, management and maintenance of the resource, the users’ dependence on the resource, the quality of their social capital, and their willingness to join forces toward self-governance of city’s UGS. A number of emerged points should be highlighted.

In spite of their comparatively small quantity, UGS in Volos are considered sufficient and well accessible, but of low quality, in relatively poor condition and without efficient management. The UGS in Volos are frequently visited and the citizens highlight their important role for the city’s quality of life and welfare. On these grounds, it is deemed necessary more money to be spent in improving existing UGS. Therefore, the majority of the respondents are willing to contribute financially to qualitative and quantitative improvement of UGS. As regards a number of institutional arrangements that would increase funding and sustain the resource, the respondents are rather positive, approving the proposal for controlled access and allocation of property rights to groups (for sustainable maintenance of the resource).

Moreover, the respondents acknowledge the capacity of user-based governance schemes, disputing both central state (nationalization) and private sector (privatization) ability to efficiently manage UGS. As regards their willingness to participate in these management schemes, the respondents seem to be rather reluctant, something which might be due to lack of such culture, low bonding and dependence with their city and adherence to traditional schemes for the management and maintenance of public goods.

In addition, a serious obstacle toward the development of user-based management initiatives constitutes the lack of trust, both among citizens and towards other interested parties, including the state (both local and central). This highlights a deficit in social capital, raising doubts on whether governance structures can be based (at least at the present state) on users’ cooperation and participation. Due to the reluctance of the citizens to engage themselves and invest in long-term relations regarding the management and maintenance of the resource, the most pragmatic solution (at least in short or medium term) would be the development of an independent coordinative body with the involvement of environmental organizations, organized citizens groups, technocrats, scientists, and, more generally, individuals with both “sensitivity” and knowledge on the topic.

Concluding this paper, we should highlight a deep-rooted problem of Greek society, which is the lack of trust both among citizens and towards the state and its institutions. As we have argued elsewhere (Arvanitidis *et al.*, 2015), we believe that this attitude impinges on the possibility of developing bottom-up, user-based initiatives toward sustainable management, and constitutes an obstacle to local development and welfare. Therefore, attention needs to be paid from both the state and other stakeholders to this issue, on the basis of a well-designed and strategic approach towards its improvement.

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