ENVIRONMENTAL BEHAVIOUR OF URBAN ALLOTMENT GARDENERS IN EUROPE

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KEYWORDS

Urban (allotment) Gardens, Environmental Consciousness, Environmental Behaviour, Motivation, Horticultural Practice

ABSTRACT

Across Europe, urban gardening is receiving an emerging interest from the public as well from planning authorities. Urban allotment gardens have a particular role integrating social benefits, recreation, health, food, and urban ecology issues. Differences are seen in the historical context, local regulations, gardener's motivations, and knowledge which result in different gardening behaviour. This behaviour, i.e. the use of fertilisers or pesticides, has effects on the quality of soil, water and the habitat. We report on the results of a series of questionnaire surveys undertaken between 2012-2015 by members of the COST Action (TU1201) 'Urban Allotment Gardens in European Cities' which addressed motivations, environmental attitudes and ecologically relevant behaviour. Urban regions in Poland, Austria, Portugal, Estonia and West of Scotland were studied. In Austria and Poland about 80% of the respondents identified recreational motivation dominated over food production. These results confirm former studies on Central Europe. In contrast, the supply of fruits and vegetables is the most important motivation in our Estonian, Scottish and Portuguese cases. Also in Poland and Austria food production is still of importance for those gardeners who are interested in a healthy food. Since in some cities (e.g. Warsaw, Salzburg), the majority of respondents use chemical fertilisers and pesticides, this is not the case in our Scottish and Estonian case studies. Even with this use most gardeners believe that their grown products are healthier than store bought and that their gardens are sustainable and environmental friendly. Results show the need for deeper investigation of the relation of environmental relevant garden practices, environmental risks and environmental attitudes.

INTRODUCTION

Today, urban gardening appears in a great variety types from the traditional allotment, i.e. a plot that is aimed at individual, non-commercial gardening, to more recently emerged forms such as community or neighbourhood gardens (Ernwein, 2014). In general, urban allotment gardens (UAGs) are seen to provide food and sustain human well-being, health and recreation, contributing to the provision of habitats for plants and animals and to a number of regulating ecosystem services on the local scale such as water retention and microclimate regulation (see e.g. van den Berg et al., 2010; Breuste, 2010; Guitart et al., 2012; Barthel and Isendahl, 2013; Breuste and Artmann, 2014). The natural conditions for urban gardening differ widely between the European countries as do the respective historical background, local regulations and policies for the management of UAGs as well as the gardeners' motivations resulting in different gardening practices. UAGs are often subject to environmental pressures not only as a result of contamination from former and current industrial and traffic activities, but also through the practice and behaviour of the gardeners themselves (Breuste et al., 1996). This behaviour, i.e. the use of fertilisers or pesticides, has effects on the soil, water and habitat quality. Despite the growing understanding of the multiple benefits humans can derive from UAGs, the environmental and ecologically relevant behaviour of UAG gardeners is not well understood. Do they behave in an environmentally friendly manner? Is their kind of behaviour related to their motivation and their environmental attitudes? With the aim to examine these relationships, we present and discuss the first results of an international survey on urban gardening in six European urban regions.

CASE STUDIES

Between 2012-2015, members of COST Action TU1201 'Urban Allotment Gardens in European Cities' undertook a series of questionnaire surveys (n~396) focused on the motivations, environmental attitudes and ecologically relevant behaviour of gardeners in Salzburg in Austria, the Polish cities Warsaw and Poznań, Lisbon in Portugal, Paide in Estonia, and in a number of locations in the West of Scotland. The aim was (a) to capture the motivations for urban gardening, assess also why gardeners consume their self-grown produce and what they had changed in the garden in recent years; (b) to comprehend the environmentally relevant practice by looking at the improvement of soil conditions and the use of pesticides. In addition, (c) we asked the gardeners to self-estimate their ecological behaviour.

Most of the surveys took place in traditional UAG colonies (Poland, Scotland, Estonia, and Austria), some of them existing for decades in the city centre or in suburban areas. In Lisbon, community gardens have been surveyed. Criteria for the selection of the study sites differ due to the specific scientific objectives of the respective research team. For example, the criteria were to comprise areas subjected to different urban pressures (e.g. road and industry proximity) or on the basis of previous concerns with soil quality (Lisbon, Scotland). Other criteria were to cover a broad range of different UAGs in respect to age, size, number of plots or positions within the urban structure (Salzburg, Poznań, Warsaw). In Paide, a colony founded by employees of a former dairy factory was selected as a result of convenience sampling. Despite that, the same questionnaire was used as a base in all case studies, only slightly adapted to the respective local situation and to the specific research focus and translated in the native language. For the same reasons, some questions were not used in all national studies.

In Salzburg, the questionnaires were distributed by the directors of the four sites (added up 284 plots); 156 gardeners answered. In Poznań 100 (21 sites) and in Warsaw 90 (three sites) gardeners completed the questionnaires. 15 gardeners were asked face-to-face in one site in Paide, 15 in West Scotland, and 20 in Lisbon (six community gardens). The survey can thus be considered as a pilot study, but the data provides a standardized insight into urban gardening practice in Europe.

RESULTS

Please note that percentages shown in tables do not always sum to 100% as multiple answers were sometimes given; the hyphen (-) means 'not asked'.

As shown in table 1, in Salzburg (Sb), Warsaw (Wa) and Poznań (Pz) relaxation and recreational motivations as well as connectivity to nature dominated over food production. This contrasts with Paide (Pa), West Scotland (WS) and Lisbon (LI), where the self-supply with fruits and vegetables were the most important motivation for urban gardening.

Table 1: What were the main motivations for choosing an allotment? (Multiple answers possible)

Motivation	Sb	Wa	Pz	Pa	WS	Li
Recreation and recovery	80.3%	82.3%	80.0%	6.7%	-	35.0%
Space for children to play	18.5%	24.3%	23.0%	0%	-	0%
I love gardening / gardening is my hobby	64.3%	51.3%	26.0%	20.0%	20.0%	55.0%
Silence/ fresh air	57.3%	60.0%	64.0%	6.7%	13.0%	25.0%
Self-supply with fruits and vegetables	45.9%	24.7%	30.0%	86.7%	66.0%	85.0%
Compensation for missing balcony, terrace or garden	32.5%	10.0%	21.0%	53.3%	0%	10.0%
Community spirit / to establish ties with others	22.9%	25.0%	21.0%	13.3%	0%	20.%
Connectivity to nature	65.0%	68.5%	58.0%	40.0%	0%	-
Number of answers, n=	156	90	100	15	15	20

Most gardeners had changed the usage of their garden in the last 10 years. In Poland, gardeners clearly increased the proportion of lawn, covering ca. 40% of total plot area (data not shown); in the West of Scotland, Poznań and Salzburg the number of flower beds has increased.

Table 2: What have you changed in the last years in your garden? (Multiple answers possible)

Changes	Sb	Wa	Pz	WS
More lawn	24.8%	57.6%	58.0%	-
Less vegetable patches	23.6%	29%	24.0%	47.0%
More flower beds	41.4%	55.7%	49.0%	53.0%
More space for leisure time (e.g. terrace, pergola...)	27.4%	-	34.0%	-
More possibilities / bigger area for children to play	5.7%	14.6%	13.0%	-
Nothing	17.2%	3.0%	10.0%	-
Number of answers, n=	156	90	100	15

In addition, we asked the gardeners, why they consume their home-grown vegetables and fruits in particular. In all countries, large percentage thought that their own produce was healthier than that from the supermarket, but apart from this, answers differ widely. In Estonia an important additional reason was to save money, in contrast in Poznań, where almost a quarter did not cultivate fruit or vegetables, only 2 % indicated this cause (see table 3).

Table 3: Why do you consume your home-grown vegetables and fruits in particular? Attention: in Salzburg and Poznań only one answer was possible, in Warsaw and Paide multiple.

Reason of Consumption	Sbg	Pz	Wa	Pa
It was produced and has to be consumed	11.1%	19.0%	12.3%	0%
Quality (taste) is better	31.3%	18.0%	50.0%	20.0%
It is healthier /less harmful substances	47.5%	37.0%	56.7%	86.7%
I can save money	-	2.0%	28.7%	66.7%
It is fun / I simply like it	-	-	71.0%	40.0%
Others	10.1%	-	-	26.7%
I don't cultivate fruits nor vegetables	-	24.0%	7.0%	-
Number of answers, n=	99	100	90	15

When asked how they improve the soil conditions, in all countries gardeners indicated self-generated compost, manure or other organic fertilizers. In Salzburg, Poznań and to a minor degree in Lisbon chemical fertilizers were used; only the gardeners in Paide indicated not to use chemical fertilizers (see table 4). In Warsaw 48.7% of gardeners apply natural fertilizers regularly; however 56.33% still use also chemical fertilizers (data not shown).

Table 4: How do you improve the soil conditions in your allotment? (Multiple answers possible)

Soil Improvement	Sb	Pz	Pa	Li
Compost, manure, other organic fertilizers	84.7%	72.0%	93.3%	90%
Peat	7.6%	48.0%	13.3%	15%
Chalk	34.4%	42.0%	0%	0%
Mineral multi-range fertilizers	27.5%	33.0%	0%	5%
Nitrogen	15.4%	8.0%	0%	5%
Phosphate	8.9%	2.0%	0%	0%
None	1.9%	8.0%	-	0%
Number of answers, n=	155	100	15	20

In relation to the use of pesticides, big differences are observed across the case studies. In most locations, respondents admitted to use pesticides at some stage or regularly during the year. Only in Scotland was this practice absent and only a minority in Paide identified that they occasionally used pesticides (see table 5).

Table 5: Do you use any pesticides?

Usage of Pesticides	Sb	Wa	Pz	Pa	WS	Li
Regularly	1.9%	6.0%	5.0%	0%	0%	0%
Sometimes	54.2%	20.1%	53.0%	0%	0%	25.0%
On rare occasions	-	22.2%	-	13.3%	0%	35.0%
Never	43.9%	51.7%	42.0%	93.3%	100%	40.0%
Number of answers, n=	155	90	100	15	15	20

Do gardeners think that they behave in an ecological manner on their UAG? Results show that most respondents estimated themselves that they always or most often behave in an ecological and sustainable manner, in all countries (see table 6). In Warsaw plot holders were asked if in their opinion their UAG is ecologically sustainable or not. 94.3% of them gave a positive response.

Table 6: Do you think that you behave in an ecological/ sustainable manner in your allotment?

Ecological behaviour	Sb	Pz	Pa	WS	Li
Yes, always	19.7%	23.0%	66.7%	53.3%	80.0%
Mostly / more often	70.4%	58.0%	26.7%	46.7%	5.0%
Sometimes	-	-	0%	0%	10.0%
Hardly/ rather seldom	5.3%	13.0%	0%	0%	0%
Never	0,7%	0%	0%	0%	0%
I don't know	4.0%	6.0%	0%	0%	5.0%
Number of answers, n=	152	100	15	15	20

DISCUSSION

Despite some differences in the format of questions and in the total number of respondents, these results give interesting insights into urban gardening practice across Europe, showing a number of differences and some common aspects of behaviour. They point to some aspects which raise questions for further and deeper research.

Interestingly, there seem to be two contrasting clusters of behaviour. In Poland and Austria, UAGs are increasingly seen and used as a place for recreation and relaxation. We did not ask how people behave in detail on the UAGs and what they do for recreation.

Even if some gardeners might see exhausting physical gardening practices as recreation, the change of plot use to more easy-maintenance lawn indicates a reduction of work load. Edible plants are successively replaced by lawns and ornamental species. In Poland, the country with the highest number of UAGs in relation to the population in Europe (Wycichowska, 2013), some gardeners even stop to grow fruits and vegetables (which is not permitted in other countries such as UK and Austria). These results confirm previous insights (see Breuste, 2010; Pawlikowska-Piechotka, 2011; Szkup, 2013; Breuste and Artmann, 2014) regarding the use of traditional UAGs. In contrast, the supply with fruits and vegetables is the most important motivation for the gardeners in our Estonian, Scottish and Portuguese cases. This is still of importance in Poland and Austria, for those gardeners who are interested in a healthy food production and do not trust the quality and taste of vegetables and fruits they can buy.

These differences in motivation might be also due to the current life situation of the gardeners as well as costs of gardening. In countries which experienced early industrialization, UAGs were specifically created to improve the quality of life of urban workers at the beginning of the 20th century. The two World Wars as well as the communist period in Eastern Europe forced the urban population to grow for subsistence and authorities to provide space. In communist Poland, UAGs were crucial for food provision that in present days clearly is of less importance than recreation. The economic situation for the majority of Polish people has changed significantly, and numerous supermarkets offer cheap fresh products. In Salzburg, even if the UAG lease is low, plot holders have to pay a transfer fee to the former plot holder for the garden cabin, tools, plants etc. This transfer fee has risen and leads to social selection (Atzensberger 2005). In addition, waiting lists are long. Due to these barriers, the younger generation who are interested in growing their produces, tend to join or organize new forms of urban gardening that are much cheaper, less compulsory and meet their expectations in organic gardening (Voigt, 2014).

In contrast, the contribution of UAGs to food security has recently emerged as an issue during the worldwide financial crisis of the mid 2000's, particularly across Southern Europe Countries (Cabannes and Raposo, 2013). Also Portugal, with previously little tradition of UAGs, shows a recent increase in urban gardening. The UAGs surveyed have emerged spontaneously or are introduced recently due to the Lisbon 'Urban Allotments Gardens Programme' that has come to existence to help people with low financial status (Mata, 2014). For Lisbon gardeners it is cheaper to pay the small fee to the city council instead of buying the products. So food security might be the main reason why the supply with fruits and vegetables is the most important motivation in the Lisbon case. The UAGs in Scotland were established for many decades. Legislation restricting activity may be the main motivation for produce growth for consumption. By definition of the UK Allotments Act an AG must be wholly or mainly cultivated for the production of vegetables or fruit crops for consumption by the tenant or his/her family. In addition, digging for subsistence is a powerful cultural tradition in the UK.

In relation to environmentally relevant practice, the high percentage of people using organic fertilizers is striking. However, keeping in mind that producing and using compost is a quite obvious and usual practice in gardening for both the disposal of the organic garden waste and for soil improvement this result is not so surprising. In Poland, plot users are even obliged to compost organic wastes. Our results show that a lot of gardeners also use mineral fertilizers. For this and other means of soil improvement such as adding chalk or peat, it would be interesting to compare the practices with the resulting soil properties on the plots. Are the practices appropriate for the improvement of local soil conditions? However, sampling soil now will show conditions accumulated over a long time; soil properties may be related to diverse practices of past tenants and not to what is done now.

There seem to be big differences in the use of pesticides. These disparities between the case studies cannot be wholly explained by differences in national regulations. In Lisbon UAGs, pesticides are forbidden, but this does not mean that they are not used. In Poland, gardeners are obliged to combat plant diseases and pests by application of chemical plant protection treatments selected by the National Council of Polish Allotment Gardeners. In Scottish and Estonian UAGs, pesticide use is allowed, where commercially available. However, but people do not use them (much). Perhaps this could be explained by disparities in perception or education. The use of pesticides is perceived to be linked to a wide range of health problems and environmental impacts. It would be interesting to review the detailed understanding and motivation of UAG users in this activity across the EU dimension.

Interestingly, despite the use or absence of these substances, most gardeners believe that their grown products are healthier (and tastier) than store bought and that they behave in a sustainable and environmentally friendly manner. It would be interesting to investigate the gap between self-perceptions and attitudes of gardeners as environmentally friendly and their actual behaviour.

CONCLUSION

Urban allotment gardens provide a unique combination of productive land and recreational places to European cities, which in turn provide multiple benefits to urban inhabitants. To increase these benefits it is useful to look on gardeners motivations, their attitudes and practices. Our results highlight the wide range of motivations for urban gardening in Europe with emphases on recreation

and food supply and disparities in environmentally and health relevant behaviour and attitudes.

In further research it would be interesting a) to link the questionnaires results on environmental practices with results from soil, water and food sample analysis. This will allow understanding the suitability of gardening practices as well as resulting qualities and problems, and to assess potential public health risk due to inadequate horticultural practices. b) Another task would be to study the gap between self-perceptions and attitudes of gardeners and their actual behaviour.

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Graphic Design: Tuumik Stuudio OÜ

ISBN 978-9949-536-97-9

Edited by the Department of Landscape Architecture,
Estonian University of Life Sciences
Tartu, Estonia
Tartu 2015

ORGANIZED BY

Department of Landscape Architecture,
Estonian University of Life Sciences
On behalf of
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