Urban and Peri-urban Agriculture in Kyiv (Ukraine): "Crisis Induced Strategy" versus Recreational Resource

Komirenko Z. [1], Hoermann D.M. [2]

[1] University of Alberta/Rural Economy Department, Edmonton, Canada
[2] Leibniz University of Hanover/Horticultural Economics, Hanover, Germany

Abstract — **For the study 240 Kyiv households with urban and peri-urban agriculture (UPA) have been surveyed in 2005. Quotas were assigned to four different types of plots. A standardized questionnaire was developed to collect data on crop and animal production, inputs, sales of produce for income, importance of the plot for self-sufficiency, recreation and leisure time. A factor analysis is employed to reduce attitudinal data. Based on factor scores a cluster analysis is conducted to segment the respondents into more homogeneous groups and to show multiple purposes of UPA. Four clusters labeled as "Seekers of leisure activities", "UPA-dependent growers", "Recreation-oriented growers" and "Little engaged growers" are created. Multiple purposes of UPA are shown by profiling the clusters due to demographic, socio-economic and other selected characteristics. The results show that depending on the type of plot the importance of UPA shifts from livelihood necessity to recreational resource or combines both.**

Keywords — **Urban and peri-urban agriculture, livelihood, Ukraine.**

I. INTRODUCTION

Urban and peri-urban agriculture (UPA) is practiced all over the world to cope with poverty, to provide household food security, to create additional working places and income as well as to enhance health by physical work. In the period of Soviet Union UPA served as an additional source of fresh food due to scarce market supplies and too small assortment in the stores. When Ukraine became an independent state in 1991 UPA turned to be a livelihood strategy for a significant number of Ukrainian households under conditions of economic crisis. Thus, the main aim of this study is to investigate UPA in Ukraine as one of the livelihood activities and a strategic barrier to the negative effect of economic shocks on the households' welfare as well as the source of recreation.

A. Definition of urban and peri-urban agriculture

Urban agriculture refers to areas within the city for growing crops and raising small livestock for self-consumption or sale on neighbourhood markets [1].

Peri-urban agriculture refers to production units close to town, which operate intensive semi- or fully commercial farms to grow vegetables and other crops, raise livestock, and produce milk and eggs [2]. The definition depends not only on the distance to the town, but also on the infrastructure of traffic system. In the case of good infrastructure the distance can be greater than in the case of poor infrastructure, since the time needed for transport can be reduced. Due to the different roles, which it plays in different countries and even cities, there is no common definition of UPA, embracing all aspects sufficiently.

B. Involvement in urban and peri-urban agriculture

Involvement of UPA households in agricultural production has been associated previously only with the survival strategy of poor in developing countries. More recent studies show a larger diversity of socio-economic groups including middle and higher income households practicing urban agriculture in many cities of Africa, Latin America, and NIS countries [3].

In the capital of Cuba UPA provides many people with cheap fresh vegetables and creates a lot of additional working places [4]. For the citizens of St. Petersburg in Russia there are the following reasons of practicing UPA: (a) self-sufficiency, especially for fresh food, (b) additional income from selling part of the produce, (c) access to "healthy" (i.e. organic) food, and (d) leisure and recreation [5]. In [6] urban food production is defined as a "crisis induced strategy" in developing and transition countries. In [7] the impact of UPA on food security is emphasized. It supplements food supplies from rural areas, increasing

its abundance at lower prices. Furthermore, products from UPA are rich in micro- and macronutrients due to their freshness, contributing to a healthier diet.

When economic conditions of the country are improving, many households tend to use their plots for leisure time activities. In this case UPA contributes more to human recreation rather than to "survival" [8]. Recent findings show a positive impact of physical exercises in gardens on public health (e.g. reduction of the risk of coronary heart disease, chronic diseases and overweight) [9].

II. RESEARCH OBGECTIVES AND HYPOTHESIS

The main objective of the study is to investigate the importance of UPA as a livelihood strategy versus recreational resource for Ukrainian households.

Based on the objective the following hypotheses are developed:

- the larger share of products from UPA is used for self-consumption;
- produce from UPA is an important relief to the household budget;
- UPA is a significant resource for recreation.

III. METHODOLOGY

A. Household survey

The target population for the survey is all households in Kyiv and its suburbs, which dispose of a plot of land used for growing crops and keeping livestock. However, since the complete set of addresses is not available due to an imperfect and decentralized system of plot registration, the survey sample could not be drawn by random. Therefore, the following quota sampling was applied according to the types of plots: 50 urban backyards, 50 peri-urban backyards, 60 dachas, and 80 individual subsidiary farms. For the face-to-face interview a standardized questionnaire was developed. The survey was conducted in summer 2005 by eight trained students of the National Agricultural University of Ukraine.

Because of the selected sampling method and a low number of interviewees the survey results cannot be considered as fully representative. However, they can provide valuable indications on the present situation and tendencies.

B. Types of plots

Urban backyards belong to families, which live in single-floor houses. They usually have a small plot of land (300 - 800 sq.m) at the backyard of their house.

Peri-urban backyards are also plots with single-floor houses, which are situated in villages around Kyiv. The size of plots differs from 600 to 3,000 sq.m and more. Often the production is of commercial character. Another distinctive characteristic of these two types is that the families are residing on the plots.

Dachas are summerhouses with a piece of land. In most cases the size of the plot is 600 sq.m. Some of them are located in the city. Others are rather distant from the city center, forming "small villages" with an own infrastructure.

Individual subsidiary farms are mainly plain plots outside the city. Households have been obtaining property rights for individual subsidiary farms of 0.6-2 ha according to the procedure of privatization, which started in 1992. The produce from these plots is quite diverse and includes grain and fodder crops, fruit and vegetables.

IV. RESULTS AND DISCUSSIONS

A. General characteristics of plots

Since UPA was quite common in Ukraine before USSR disintegration, the percentage of the respondents who till their plots for 16 years and more is considerably high and comprises 56 %. The remaining respondents have been tilling their piece of land for 15 years and less – the period of Ukrainian independence and series of economic crises.

Plot sizes of around 60 % of both dachas and urban backyards do not exceed 1,000 sq.m. This can be explained by the scarce land resources in the city, or in the case of a dacha by the standard plot sizes. Respondents with peri-urban backyards and individual subsidiary farms have plots of more than 2,000 sq.m in around 50 % of the cases.

Most of the interviewees use a considerable share of their plots for crop growing. However, it differs

strongly between the types of plots (e.g. 44 % of the respondents with an individual subsidiary farm and only 4 % of the respondents with an urban backyard use more than three quarters of their total area for crops). Flowers and ornamentals take remarkably less space in general. High shares of the interviewees with urban backyards and individual subsidiary farms use only up to 5 % of their area for flowers.

B. UPA products

The most important crops for the interviewees in terms of money are potatoes (61 %) followed by fruit (16 %), tomatoes (12 %), and cucumbers (8 %). It should be noted that tomatoes and cucumbers are the most common vegetables in Ukraine (potato is considered to be a staple crop). Detailed by types of plots potato is the most important crop for all the types except urban backyards, where fruit take the first place.

In our sample 66 % of the peri-urban backyard owners raise animals. In the group of urban backyards this share is 18 %, for individual subsidiary farms 15 %, and for dachas only 8 %. Poultry is kept most frequently and on all types of plots, since it requires less space and feed compared to other animals. Cows are kept exclusively by the respondents with peri-urban backyards. The highest quantities of pigs, goats and rabbits are also raised on peri-urban backyards.

C. UPA products as a relief to the household budget

The importance of the subsistence products from UPA as a relief to the household budgets is measured by the increase of food expenditures if the own supply would not be available (table 1).

The shares of expenditures increase vary significantly between the types of plots (χ^2 = 37.9, $p \leq 0.01$). Around 3/4 of the households with an urban backyard and over 2/3 with a dacha would have to increase their expenditures for food up to 25 % as a result of the absence of own supply. On the contrary, over two thirds of the households with a peri-urban backyard and 42 % of the households with an individual subsidiary farm would have to increase the expenditures from above 25 up to 50 %.

Table 1 Increase of food expenditures without own supply

Increase of expenditures	Total	Urban backyard	Peri-urban backyard	Dacha	Individual subsidiary farm
	N=238	n=50	n=58	n=50	n=80
	%	%			
≤ 5 %	16	18	26	10	10
> 5-10 %	18	32	22	4	14
> 10-25 %	26	26	19	20	34
> 25-50 %	27	10	22	42	31
> 50 %	14	14	10	24	11

Question: "Your own production of food allows you to reduce expenditures on food. Can you tell approximately the share by which the total food expenditures would increase in your household without this own supply?"

These results confirm that UPA produce is an important relief to the household budget (especially in the case of peri-urban backyards and individual subsidiary farms) and serve as a buffer under conditions of economic crisis.

Along with self-consumption sales of products from UPA also take place. Of the total sample 20 % sell produce. Of these 22 % also sell flowers and ornamentals. Hence, the importance of sales of food products and ornamentals as a source of additional income is only given in a limited number of households.

D. Recreation and leisure

An important part of UPA, which is completely different from the objectives of subsistence production, is recreation and having leisure time activities on the plot. As it was expected, the level of importance which is attributed to the recreation is significantly higher (χ^2 = 36.6, $p \leq 0.01$) for the respondents with dachas and urban backyards (figure 1). Peri-urban backyards show quite high importance for recreation as well, since the plot is situated at the residence of the respondents and can be visited easily. Individual subsidiary farms are least important for recreation (e.g. due to a larger distance to the plot, absence of house or even some shelter on the plot).

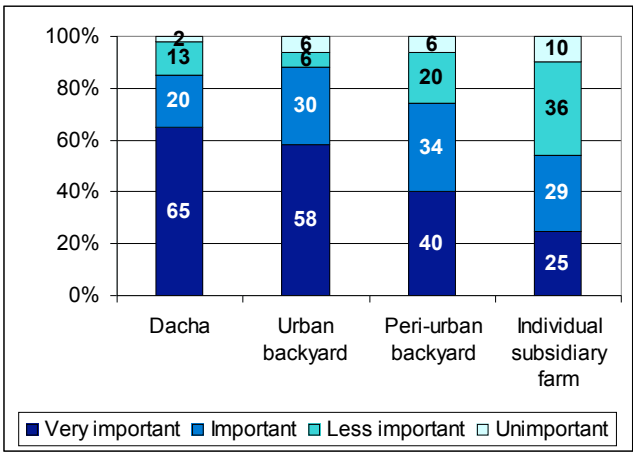

Fig. 1 Importance of the plot for recreation

The frequency of having leisure time activities on the plot is also different between types of plots: 45 % of dacha owners and 40 % of urban backyards owners spend their time on the plot without working very often. On the contrary, 58 % of the respondents with individual subsidiary farms never spend leisure time on the plot or do it only rarely.

Thus, the significance of UPA as a resource for recreation and for leisure time activities (especially for dachas and urban backyards) is high.

E. Factor and cluster analysis

A factor analysis of the 33 statements measuring attitudes of the respondents towards practicing UPA is conducted. Eight factors are extracted: (1) Recreation by work and nature, (2) Economic importance of subsistence production, (3) Leisure time activities, (4) Mutual help, (5) Preference for own food, (6) Plot as a source of happiness, (7) Happiness with flowers, and (8) Tradition of tilling land. Interpretation and labeling of factors is based on factor loadings (ranging from 0 to 1), which are correlation coefficients between a variable and a factor (i.e. the higher is the loading of the variable on the factor, the higher is the association between them) [10].

Cluster analysis enables to group individuals into more homogeneous subgroups based on their similarities [11]. The objective of the cluster analysis is to identify a typology of the respondents involved in UPA based on the eight factors extracted. The 4-cluster solution is derived.

"Seekers of leisure activities" (37 %) do not consider their own food to be much fresher and tastier than food from supermarkets. For them the subsistence production is not of high economic importance. Hence, they use 1/4 to 3/4 of their plots for crop production. Members of this group are happier with their plot and the flowers on it than the others. They enjoy leisure time activities on the plot more often. Members of this cluster are most prepared for the exchange of products and joint harvesting. However, recreation by physical work on the plot is not of a big importance. As expected, most of the "Seekers of leisure activities" own a dacha. A high percentage of this group (65 %) consider governmental support of UPA as necessary.

Members of the cluster *"UPA-dependent growers"* (37 %) attribute the highest importance to subsistence production and the lowest to leisure time activities. They tend to prefer their own food and continue the tradition of tilling land. To the same extent as members of the cluster "Seekers of leisure activities", they are happy to have a piece of land and like to grow flowers on it. They are older, less educated and have the lowest income. Members of this cluster have reported the highest percentage of food expenditures increase without own supply. The cluster consists of 33 % individual subsidiary farms and 25 % peri-urban backyards. Governmental support of UPA is considered to be necessary by 73 % of the respondents, which is the highest among the clusters.

The cluster *"Recreation-oriented growers"* (17 %) is labeled by its most distinguished characteristic "Recreation by work and nature" and attributes the highest importance to it, whereas leisure activities play only a minor role. The highest household income is at the disposal of this cluster. These cluster members reported the least increase of food expenditures without own supply. However, they believe that their own food is fresher and tastier than the purchased products. Normally they use more than 1/3 of their plot for agricultural purposes. Dachas constitute 42 % in this segment. It has the highest percentage of the respondents (25 %), who do not consider governmental support of UPA to be useful.

"Little engaged growers" (9 %) is the smallest segment and includes the youngest members. They are not in fond of growing flowers, tilling of land is not a

tradition for them, and they do not consider their plot as a resource for recreation. In economic terms, the importance of subsistence production is below average. The cluster members do not have specific preference for own food. They are involved in leisure time activities on the plot only rarely. Despite these results, the cluster members are a bit happier with the plot than the total average and do not want to get rid of it. The segment consists of 55 % individual subsidiary farms with quite a big production area. This cluster has the highest share of the respondents (45 %), who are not sure (i.e. do not know), whether the Government should support UPA.

V. CONCLUSIONS

The analysis shows that UPA is an important livelihood "crisis induced" strategy especially for the respondents with *peri-urban backyards and individual subsidiary farms:*

- the scale of production is larger and more important for the livelihood of the households;
- consumption of the subsistence products relieves the food budgets of 2/3 of the interviewees by 25 to 50 % and more.

Recreation and leisure time activities are an integral part for the owners of any plot types, but especially for *urban backyards and dachas:*

- the respondents attribute higher importance to recreation and leisure time activities;
- the area under flowers and ornamentals is usually larger compared to the other types of plots.

Segmentation of the interviewees confirms multiple purposes of UPA in Ukraine and is useful in designing future support and development strategies for it. Mutual help in growing crops and harvesting, value of freshness and taste of own food are among the other distinguished characteristics of Ukrainian UPA.

This study is a contribution to the world literature on urban agriculture case studies.

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- Author: Zoia Komirenko
- Institute: University of Alberta, Department of Rural Economy
- Street: 515 GSB
- City: Edmonton, AB
- Country: Canada T6G, 2H1
- E-mail: komirenk@ualberta.ca