

## SUBSISTENCE AGRICULTURE IN CENTRAL AND EASTERN EUROPE: DETERMINANTS AND PERSPECTIVES

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### ABSTRACT

Subsistence agriculture in Central and Eastern Europe (CEE) has only recently gained interest from agricultural economists. Their origin, their future and even their definition is still not well elaborated. This paper tries to throw light on the issue of subsistence farming in CEE. It first discusses the theoretical and empirical background of subsistence agriculture. This part is followed by a typology of subsistence farming as found in CEE. Analysis considers several hypotheses on the cause of subsistence agriculture, among them the structure of land ownership, market imperfections and lack of alternative income sources or low opportunity costs of labour respectively. Of all these hypotheses, only the latter can be proofed empirically, which is done by a nonlinear regression analysis. The paper concludes that this gives reason to argue that rather economic problems than specific problems related to the agricultural structure in CEE determine the degree of subsistence farming. Consequently, structural and social policies rather than agricultural policies like market intervention are to be considered.

Keywords: Subsistence agriculture, transition, Central and Eastern Europe

### 1 INTRODUCTION

Food production in private households has formed an important part of the total production in many countries in Central and Eastern Europe (CEE) for decades, even before transition. In other transition countries the orientation towards subsistence agriculture has increased due to the processes of change and restructuring during the last ten years.

*Subsistence production* describes the production of the amount that is necessary to cover the nutritional needs of the farmer and his family, and which is consequently not for selling but for home-consumption.

Generally speaking, the term *subsistence agriculture* is used for farms that are consuming a fundamental part of their own net production in their household and therefore do not primarily produce for the market. The bigger the part of own-consumption is, the higher is the *degree of subsistence*. There is no common definition in literature to the question of the size of this part. E.g. DOPPLER (1991) defines farms producing at least 90% for their own consumption as *subsistence oriented*, farms producing between 90 and 10% for their own consumption as *subsistence and market orientated farms* and farms consuming less than 10% as *market oriented farms*.

So far, scientific discussions about subsistence agriculture concentrate rather on studies in the tropics and subtropics than on research in Europe.

Concerning in particular the development of subsistence orientation in Europe there are only a few scientific studies up to the late 90's. CAILLAVET and NICHELLE (1999) proofed a significant negative correlation between the amount of subsistence production of vegetables and household income in France. Moreover, some important parameters concerning the amount of subsistence production were identified during this study, e.g. the household size and the affinity of household members to agriculture. Other sources report on certain forms of agriculture with a subsistence function in the south of Europe. That proofs the existence of subsistence agriculture even in highly developed agricultural systems like the one in the EU, an issue that has not so far being paid attention in agricultural policies (THIEDE 1994).

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The problem of subsistence farming became increasingly important during the early 90's because of the increasing awareness of subsistence agriculture in CEE during the transition process.

In the now upcoming scientific discussion, the following questions are to consider:

- What are the causes of for subsistence agriculture? Reasons like lacking alternative income sources, or institutional frameworks (e.g. not functioning procurement and sales markets), or the split structure of small farms created by the decollectivisation have to be taken into account.

- What are the consequences of the increasing subsistence orientation in agriculture for the employees of this sector and for regional or sectional disparities?
- How much political intervention is necessary and what kind of political measures should be taken in order to handle subsistence agriculture?

This paper deals with these questions and tries to outline some answers. The main problem of the paper is that it is quite difficult to obtain comparable structural data of the agricultural sector in CEE-countries. As a consequence, in cases of not satisfactory data materials for an empirically founded analysis, theoretic arguments are given to outline the probability of an argument raised to explain the existence of subsistence agriculture. It should moreover be seen as work in process that has to be refined further.

## 2 THEORETICAL BASICS OF SUBSISTENCE AGRICULTURE

The economic evaluation of subsistence farming concerning their causes and, first of all, their effects to the farmers and to the farming systems is discussed controversially in literature. Basically there are two theoretical approaches regarding the decision making of farmers on the degree of their subsistence orientation.

In the first model, the farmer decides between market and subsistence production according to his personal preferences for the one or the other alternative. In this case, market production is reflected by the earned cash income while subsistence production is reflected by the produced amount of food. The decision is the optimisation of food- and cash income with given preferences and production restrictions. The second approach is not founded on optimisation but on the satisfaction of personal income and subsistence needs. Variables that are hard to quantify, e.g. leisure, play a fundamental role in this approach. (UPTON 1982)

Theoretic consistency as well as empirical proofs are to question for both of UPTON's approaches. The price component of subsistence products is completely missing, this can be seen as an abstraction of price margins between consumed and sold products. Such an abstraction leads to difficulties in comparison of the value of the goods, as decision making on selfconsumption or sale is influenced not only by cash income vs. nutrition values but also by transaction costs of marketing. These transaction costs cannot be analysed separately in such an approach. Moreover, analytic aspects of consumption and production theory are mixed up in the „optimisation“- approach. The existence of an inverse supply function is discussed by arguing with the help of price and income effects as described by *Hicks* in the consumption theory.<sup>2</sup> In the „satisfactory“- approach the preference for leisure supposes an inverse reaction of the supply. Both arguments are controversial to the classical and neo-classical foreign trade theory, e.g. of Ricardo, where price relations are the decisive factors when changing from autarchy to trade, as they determine what kind of goods are going to be produced, consumed and traded and therefore, on the basis of prices, it is decided where production will be expanded or reduced.<sup>3</sup> Despite these shortcomings, it is quite useful for the following discussion that in both of UPTON's approaches the remuneration of the factor 'labour' has a central importance, no matter whether the remuneration is gained on- or off- subsistence farms.<sup>4</sup>

Another point that is discussed controversially is the economic stability of subsistence farms.

DOPPLER (1991, p. 28) considers them to be (relatively) stable because they adapt their pro-

<sup>2</sup> see HENZE (1994), p. 186 ff.

<sup>3</sup> see e.g. ROSE and SAUERNHEIMER 1995.

<sup>4</sup> UPTON 1982, p. 109 and 111, THORBECKE 1982, p. 315 ff.s

duction to the given environment and they are rather independent from market risks. This assumption is not valid for the current situation in the developing countries, because risk management is limited, especially in marginal sites. Moreover, out of this aspect, market orientation of the farms seems profitable because functioning markets will compensate risks rather than induce it, as argued by DOPPLER (SCHLAUDERER et al. 2001).

Another field to be analysed is subsistence agriculture in the case of resource scarcity or bad climate conditions. Recent observations point out that innovations are restricted in subsistence systems because of production risks and a lack of liquidity. In these cases, production risk is mainly due to climatic conditions, but also due to risk induced by non-functioning markets, and resource scarcity – both in terms of natural and financial resources – reduces the

development potential of farming systems (ABELE 2001).

### 3 REGIONAL CHARACTERISTICS AND DETERMINANTS OF SUBSISTENCE AGRICULTURE IN CENTRAL AND EASTERN EUROPA

#### 3.1 Regional characteristics

Subsistence agriculture regionally differs in two aspects: on the one hand regarding its role in the different national economies, on the other hand regarding its integration in market orientated agricultural hierarchies. Figure 1 shows the role of subsistence agriculture in CEE in the national economies of CEE-countries (CEEC). A decline from East to West can be made out clearly: While in Poland only less than 5% of the population rely on subsistence farming, the percentage in the CIS is about 25% and more. The lowest importance of subsistence farming can be found in Slovenia, where domestic income is almost on the western European level.

Figure 1: Number of subsistence farms per 1000 inhabitants in 1999

Source: Own depiction, data: VON BRAUN and LOHLEIN (2001)

Another possibility to characterize subsistence agriculture is to differentiate them according to their position to market orientated agricultural farms. Basically there are two types to be discriminated: The „autarchy“-type of subsistence agriculture can be defined by the lack of integration into other agricultural systems. This type has developed out of the decollectivization during the transition process and primarily offers income possibilities for former members of the collectives, especially for elderly people or for dependent relatives, for whom it is impossible to find work elsewhere, e.g. in urban centres. The „autarchy“-type can be found in South-eastern Europe, but also in Central European countries like Poland as well as in the Baltic area.

*Number of subsistence farms per 1000 inhabitants*

< 50

51 - 100

101 - 150

151 - 200

201 - 250

> 251

No data

Poland

Hungary

Romania

Bulgaria

Ukraine

Russia

Estonia

Latvia

Lithuania

Slovenia

CR

Belarus

SR

5

#### 3.3 Income as a determinant of subsistence farming

Income gained in agriculture or elsewhere is defined as a fundamental determinant for subsistence agriculture in theoretic reflections as well as in empirical research. (see above: remuneration for the factor labour). Income, and the related opportunity costs of labour can be considered as an explanatory variable for many phenomena that are linked with subsistence agriculture.

Apparently, the adoption of the *acquis communautaire* in the EU-candidate countries among the CEEC might cause an increase of quality standards, e.g. in the case of milk production, a process that again is considered to increase subsistence farming: If there is a lack of capital in order to maintain the standards, farmers will have to stop producing for the market. If further there are no other off-farm income possibilities, they have to continue with subsistence agriculture. Thus, opportunity costs of labour determine subsistence farming.

The importance of the factor ‘labour’ as a determinant for subsistence farming is also expressed by the value of the gross production of different products that are used for selfconsumption, because labour-intensive products, as vegetables, meat or potatoes are often produced for self-consumption in CEE. Capital-intensive products, such that are subject to mechanised cultivation, or that have to be transported and processed, as grain, are not so often

self-consumed (see Figure 3). The labour-intensive products mentioned below have another characteristic: They are rather cost-intensive in transport and storage.

Figure 3: Share of subsistence in total production of chosen products in CIS [in %, 1999]

Note: CIS= Commonwealth of Independent States

Source: Own depiction according to TILLACK (2000)

The importance of income as an explanatory variable for subsistence farming economy is further shown in Figure 4. Using data from 14 CEEC and the CIS a regression analysis has been carried out, with the part of population carrying on subsistence farming as dependent variable and GDP as the independent variable. It can be shown that the per capita income itself explains almost 50 % of the variability of the subsistence part, and this with a high level of significances. There is a negative correlation between per capita income and subsistence farming, what means that an increasing per capita income leads to a declining importance of subsistence farming.

Grain Vegetables Potatoes Meat

50

25

75

0

100

Russia

Belarus

Ukraine

6

Figure 4: Correlation between subsistence farming and per capita income

Source: Own calculation (data: VON BRAUN and LOHLEIN (2001))

### 3 CONCLUSIONS

Subsistence agriculture in CEE is an area of research that has been worked on rarely so far. Besides problems concerning the definition of subsistence agricultures there are only few data and information about its background, appearances and historical development. Of all possible reasons for orientating production towards self-consumption, as e.g. structures of agricultural markets, partition of land, frameworks of law, and per capita income, the last one seems to be the one with the best empirical foundation. Regarding the importance of subsistence farming in the future one will see a faster decline in Central Europe than in Southeast- and Eastern Europe, where subsistence farming has to be considered as a fundamental source for gaining livelihood in long terms.

Subsistence farming bares some severe problems. Farmers encounter high risks, and they do not have significant potentials for increasing their income because there are no means for investment, as a low degree of market orientation brings about scarcity in financial means. The degree of subsistence orientation strongly depends on given income alternatives. Consequently there is an increasing need to search for such alternatives. Therefore, an adapted labour- and social policy seem to be more adequate in longer terms than intervening into rather insufficiently functioning markets by taking agricultural policy measures in order to reduce subsistence farming economy. The latter would mean, to start with removing the effects rather than the causes of subsistence farming.

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0  
50  
100  
150  
200  
250  
0 2000 4000 6000 8000 10000

Data base : 1999

N : 14

T-Value : -3.549

Adjusted R<sup>2</sup> : 0.471

Significance : 99 %

Korr<sub>eff</sub> : - 0.663

**GDP per capita (US\$)**

**Subsistence firms**

*(Number per 1000 persons)*

Regression function

$[\ln y = 12.054 - 0.986 \ln x]$

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Subsistence Agriculture in Central and eastern Europe:

Determinants and Perspectives

S. Abele, P. Voigt and P. Weingarten

1 Introduction

Before the transition process took place in Middle and Eastern Europe (MEE), food production

in private households formed an important part of the total production. In many transforming countries the orientation towards subsistence agriculture has increased due to the processes of change and restructuring during the last ten years. *Subsistence production* describes the production of the amount that is necessary to cover the nutritional needs of the farmer and his family, but not for selling. Generally speaking the term *subsistence agriculture* is used for farms that are consuming a fundamental part of their own net production in their household and therefore do not produce for the market. The bigger this part is, the higher is the *degree of subsistence*. There is no common definition in literature with respect to the question of the size of this part. E.g. DOPPLER (1991) calls farms producing at least 90% for their own consumption *subsistence oriented*, farms producing between 90 and 10% for their own consumption *subsistence and market orientated farms* and farms consuming less than 10% *market oriented farms*.

Scientific discussions about subsistence production in agriculture concentrate more or less on studies in the tropics and subtropics.

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How much political interaction is necessary and what kind of political measures should be taken in order to handle subsistence agriculture?

The following paper deals with these questions and tries to outline some answers. In cases of not satisfactory data materials for an empirically founded analysis, theoretic facts are considered.

## 2 Theoretical basics of Subsistence Agriculture

The economic valuation of subsistence farming concerning their causes and first of all their effects to the farmers and to the operating systems is discussed controversially in the literature. Basically there are two theoretic approaches regarding the decision on the degree of subsistence orientation.

In the first model, the farmer decides between market and subsistence production according to his personal preferences for the one or the other alternative. In this case, market production is reflected by the earned cash income while subsistence production is reflected by the produced amount of food. The decision is the optimization of food- and cash income with given preferences

and product restriction.

The second approach is not founded on optimization but on the satisfaction of personal income and subsistence needs. Variables that are hard to quantify, e.g. leisure, play a fundamental role in this case. (UPTON 1982)

Theoretic consistency as well as empirical proofs are to question for both of UPTON approach the preference for leisure supposes an inverse reaction of the supply. Both arguments are controversial to the classical foreign trade theory, e.g. of Ricardo, where price relations are the decisive factors when changing from autarchy to trade, they decide what kind of

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goods are going to be produced, consumed and traded and therefore decide where production will be expanded or reduced.

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Concerning in particular the development of subsistence orientation in Europe there are only a few scientific studies up to the late 90's. CAILLAVET and NICHELLE (1999) proofed a significant negative correlation between the amount of subsistence production of vegetables and the household's income in France. Moreover, some important parameters concerning the amount of subsistence production were identified during this study, e.g. the household's size and the

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The problem of subsistence farming increasingly became important during the early 90's because of the significance of subsistence agriculture in CEE in European contexts.

The following questions are to consider:

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such approaches. The price component of subsistence products is completely missing, this can be compared with an abstraction of price margins between consumed and sold products. Moreover,

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2 Vgl. hierzu z. B. ROSE und SAUERHEIMER 1995.

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UPTON's approaches the remuneration of the factor 'labour' has a central importance, whether on or off subsistence farms.

3

Another point that is discussed controversially is the economic stability of subsistence farms.

DOPPLER (1991, S. 28) considers them to be (relatively) stable because they adapt their production

to the given location and they are rather independent from market risks. This assumption is not valid for the current situation in the developing countries, because risk management is limited, especially in marginal sites. Moreover, out of this aspect, market orientation of the farms seems profitable because functioning markets can compensate risks (SCHLAUDERER et al. 2001).

Another field to be analysed appears before the background of subsistence agriculture in the case of resource scarcity or bad climate conditions. Recent observations also point out that innovations are restricted in subsistence systems because of production risks and lack of liquidity (ABELE et al. 2001).

3 Regional characteristics and Determinants of Subsistence agriculture in Central and eastern europa

3.1 Regional characteristics

Subsistence agriculture differs in regional aspects in two meanings: on the one hand regarding its role within the economy of

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3 UPTON 1982, S. 109 und 111, THORBECKE 1982, S. 315 ff.  
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