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Subsistence farming, incomes, and agricultural livelihoods in the new member states of the European Union

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Abstract. Drawing on primary survey data and the literature on sustainable livelihoods, we analyse agricultural households in five new member states of the EU which possess a large subsistence and semisubsistence farming sector. The study indicates that the contribution of subsistence farming to household incomes is significant. The profiling of agricultural households, using cluster analysis, reveals four main types which differ significantly in terms of engagement in nonmarketed production. The poorest households form the largest cluster. They possess low natural, physical, and social capital, operating small-scale and undercapitalised farms with little nonagricultural income. The main EU Common Agricultural Policy instruments are not well suited to respond to the specific needs of these poor subsistence farmers.

Keywords: agricultural households, sustainable livelihoods, subsistence farming, rural development, Central and Eastern Europe

1 Introduction

The two enlargements of the European Union in the 2000s, incorporating countries from Central and Eastern Europe, significantly changed the farm structure in Europe and consequently the problems faced by rural areas. Eurostat (2009a) data indicate that the twenty-seven member states of the EU collectively possess 9.6 million agricultural holdings smaller than 5 ha. The new member states (NMSs) from Central and Eastern Europe account for 68% of these small farms, and most NMSs continue to be characterised by a large number of small-scale units and a small number of large operations. Although some of the EU-15 member states also retain such a dualistic structure (Hubbard and Gorton, 2011), if the NMSs are compared with the EU-15 average, medium-sized market-oriented farms—in terms both of absolute numbers and share of utilised agricultural area (UAA)—remain far less prominent. Most of the small-scale units in the NMSs are subsistence or semisubsistence farms with limited market participation (Fritzsch et al, 2009; Mathijs and Noev, 2004). The expansion of semisubsistence farming (SSF) in the EU represents one of the biggest challenges for the Common Agricultural Policy (CAP) (Burrell, 2009; Davidova, 2011a).

The prevalence of subsistence farming (SF) and SSF gives rise to important debates concerning agricultural incomes and livelihoods. Regarding livelihoods, a focus on

purely agricultural cash incomes is too narrow; farm households may have multiple sources of income, and nonmarketed agricultural production may provide a substantial share of the food needs of poor agricultural households.

Subsistence production has different roots in Central and Eastern Europe. In most of the Central and Eastern European countries, prior to political and economic transition, agriculture was collectivised, but the members of state and collective farms were allocated small plots—for example, 0.3 – 1 ha for household use (Forgacs, 2010). After the start of the reforms in the late 1980s land reform including restitution of land ownership to the previous owners or their heirs, or distribution of plots to the former members and employees of cooperatives resulted in the creation of millions of small farms which—owing to the low living standards and high industrial unemployment—produced for mainly household consumption. In some countries—for example, Poland and the countries of the former Yugoslavia—agriculture was never fully collectivised. Swain (1999) argues that, since both countries did not want the development of capitalism in rural areas, farms remained small.

Whilst some authors (Kostov and Lingard, 2002; 2004) treat the engagement in SF/SSF as distress driven, more recently, Larsen (2009) contends that SSF can play a different, positive role in improving rural incomes in the NMSs. She argues that the characteristics of SSF (local food production, short supply chains, high biodiversity, and rich cultural heritage) provide a valuable asset for the creation of greater value-added and alternative rural enterprises such as agrotourism, environmental services, handicrafts, and speciality foods. However, this is not the prevailing view in the NMSs (Gorton et al, 2008).

Regarding policy, the European Commission (Boel, 2005) recognises the prevalence of SF and SSF in the NMSs. Within the EU rural-development menu for the programming period 2007 – 13 a special transitional measure seeks to assist restructuring, focusing on the commercialisation of semisubsistence farms in the NMSs.[1] An array of other rural development measures, not specifically targeted at SSF, is available, but the uptake is limited because either SSFs are too small to satisfy the eligibility criteria or they lack financial capital to make the required private contribution. As emphasised by Papadopoulos and Liarikos (2007), some proactive member states manage to 'upload' their national approaches to the EU, but the passive ones are left with the only option to 'import' EU policies which do not always fit their structure and institutions. This seems to be the case of NMSs. This raises the question of whether the EU requires a specific SF and SSF policy, and if so, what measures may be appropriate. As evidenced in the contributions to a public debate on the future of the CAP (European Commission, 2010), at present there is no clear consensus on the topic.

The study has two interrelated objectives: first, to evaluate the role of nonmarketed production for the incomes of agricultural households and the contribution of SF to assessments of poverty; second, to produce a typology of agricultural households, drawing on the sustainable livelihoods literature and employing multivariate statistics (factor and cluster analysis). The typology provides the basis for engaging in the wider policy debate regarding the appropriateness of the CAP for the NMSs. The two objectives of the research are linked: incomes per capita excluding and including subsistence production are used as cluster profiling variables.

We draw on data collected through survey work within the EU FP6 project 'Structural Change in Agriculture and Rural Livelihoods' (SCARLED). Data collection occurred between autumn 2007 and winter 2008 in five NMSs—Bulgaria,

[1] Council Regulation No. 1698/2005, Article 20(d)(i).

Hungary, Poland, Romania, and Slovenia. The selection of countries was driven by the fact that these states collectively account for 94% of all farms that use more than 50% of the output for own consumption in the NMSs and 84% of those in the whole EU (Davidova, 2011a). Specific regions and villages in these countries were selected so that the research engaged with the wide range of farm structures, incomes, and living conditions present in rural areas in the NMSs. As in most recent studies of rural livelihoods, the unit of analysis in this research is the farm household, treated as a single person or several individuals, not necessarily related, who live together, share meals, and pool some or all of their income and who cultivate land or keep livestock.

The paper consists of six sections. In section 2 we outline the conceptual framework that informed the study. In section 3 we draw on secondary data to discuss the pattern of SF and SSF in the NMSs, beginning with a discussion of definitions. In section 4 we describe the methodology. In section 5 we present the results, and we conclude in section 6.

2 Conceptual framework: sustainable livelihoods

'Sustainable livelihoods' is an 'umbrella concept' (Buchenrieder et al, 2007), with the literature drawing on contributions from a range of academic disciplines. Chambers and Conway (1991, page 6) define sustainable livelihoods as "the capabilities, assets (stores, resources, claims and access) and activities required for a means of living." The approach seeks to understand the ways in which actors make a living and their vulnerability to stresses and shocks. Households possess differing amounts of human, natural, physical, social, and financial capital with the poor usually possessing low endowments of most types (Ellis, 2000). Strategies to improve well-being therefore typically require asset building (Moser, 2007). The livelihoods approach has most commonly been employed in a rural context and for developing countries (Ansoms and McKay, 2010; Buchenrieder et al, 2007; Ellis et al, 2003). However, to date, the livelihoods approach has rarely been applied to the former socialist states of Central and Eastern Europe who have become members of the EU.

Three features distinguish the sustainable livelihoods approach, regarding focus, agency, and methodology. First, livelihood strategies are typically diverse, with households drawing on a range of gainful activities. In an agricultural context focusing on cash incomes generated from farming is therefore too restrictive; researchers should consider the role of nonmarketed production and a household's engagement in the nonfarm rural economy. The emphasis, therefore, should not be on specific sectors such as agriculture or manufacturing in isolation, but rather on people and households (Buchenrieder et al, 2007).

Second, the sustainable livelihoods literature acknowledges that outcomes depend not only on structures but also on agency—actors in part shape their livelihoods (Ansoms and McKay, 2010). In this context the role of rural development is to *enable* poorer households to improve their well-being rather than for the state to provide ongoing cash transfers or act as the guarantor of particular welfare outcomes (DFID, 2000; Moser, 2007).

Third, researchers should employ methods that capture the heterogeneity of poor households and document the varied sources of gainful activity and asset portfolios (Ellis, 2000; Moser, 2007). Researchers, therefore, typically study, within a particular geographical area, a cross-section of poor and relatively better-off households in both deprived and less-disadvantaged villages (Bouahom et al, 2004; Ellis and Mdoe, 2003). Cluster analysis may be usefully employed to capture the heterogeneity of household profiles (Ansoms and McKay, 2010; Petrovici and Gorton, 2005).

3 Definitions and farm structures in the NMSs

A lack of data as well as the absence of a generally agreed definition constrains research on SF and SSF in the NMSs. Subsistence is a concept indicating households who operate in a state of autarky, producing for self-sufficiency without recourse to the market (Wharton, 1969). This is unusual in Europe and used mainly as a reference point to measure varying degrees of market participation. Semisubsistence farmers participate in the market, but the proportion of output sold is typically low (Balint and Wobst, 2006). In practice, in order to define and assess the size of the SF and SSF sector in Europe, there are three main criteria which can be applied: physical measures, economic size, and market participation.

Physical measures—such as agricultural land, volume of inputs, and number of livestock—define subsistence through size thresholds. McConnell and Dillon (1997) suggest 0.5 ha to 2.0 ha of cultivated land as a good proxy for semisubsistence farms. Both Eurostat (2009a) and the Food and Agriculture Organization (FAO, 2010) define small farms as those operating on an agricultural area of 5 ha or less. However, there are doubts that physical measures, and land area in particular, are appropriate indicators due to differences in fertility of land and productivity, influenced by natural, social, and economic conditions. Additionally, one important aspect is the specialisation of 'small farms'—for example, an intensive horticultural farm of 1.8 ha may be a substantial business operation.

Economic size is widely applied for statistical and policy purposes within the EU, expressed in terms of European size units (ESU).[2] Within the EU Farm Structure Surveys farms smaller than 1 ESU are classified as 'subsistence'. In addition to this, Eurostat (2009b) defines farms with less than 8 ESU as small farms. On the basis of this measure, farms between 1 ESU and 8 ESU can be classified as semisubsistence.

Within the academic literature definitions based on a market participation criterion are more common than economic size measures. While still arbitrary, the market participation criterion is fairly straightforward, taking either a consumption or a production point of view. The former focuses on the share of household consumption covered by own production to assess to what extent subsistence production can cover household needs (Ellis, 1993). However, a consumption-based approach can disregard that even a large and commercially integrated farming operation may still cover a substantial part of the food needs of the household, so it is not always appropriate in defining subsistence farms and semisubsistence farms (Davidova et al, 2009).

The production-side approach has been widely applied since Wharton (1969) first addressed the problems caused by nonuniform definitions of SF. Focusing on agricultural output markets, he argues that farm households can sell between 0% and 100% of their agricultural output. At the two extremes are purely subsistence (autarkic) and purely commercial operations with different mixes inbetween. With regard to this continuum, he introduced a threshold of 50% of marketed output, classifying farmers selling more than zero but less than 50% as semisubsistence, while labelling those above the threshold as semicommercial and commercial. Some more recent studies (Kostov and Lingard, 2004; Lerman, 2001) utilise Wharton's approach. A market participation approach, albeit with no specified thresholds, was also adopted in Article 34 (1) of Council Regulation (EC) No. 1698/2005, where semisubsistence farms are defined as "agricultural holdings which produce primarily for their own consumption and also market a proportion of their output."

[2] The value of 1 ESU is defined as a fixed number of euros of farm gross margin. Over time, the number of euros per ESU has changed to reflect inflation. Currently, 1 ESU equals €1200; 1 ESU roughly corresponds to either 1.3 ha of cereals, one dairy cow, or twenty-five ewes, or equivalent combinations of these (https://statistics.defra.gov.uk/esg/asd/fbs/sub/europe_size.htm).

The size of the semisubsistence sector in the EU-27 varies depending on which of these criteria is employed (table 1). Taking into consideration the EU-27 as a whole, in 2007 there were 9.65 million small farms below 5 ha (70.4% of all agricultural holdings) operating on 8.4% of UAA. The use of this physical measure illustrates the enormous heterogeneity within the EU-27. In 2007 farms smaller than 5 ha represented more than 90% of all farms in Malta and Bulgaria, but only 2.8% in Denmark. Regarding agricultural land, with the exception of Malta, farms smaller than 5 ha operate less than half of UAA. Nevertheless, they are important in Romania (operating 35% of UAA in 2007), Cyprus (29%), Greece (27%), and Slovenia (22%).

Table 1. Prevalence of subsistence and semisubsistence farming in the EU by different criteria (year 2007) (source: Eurostat, 2009a; 2009b).

	Number of farms	% of total farms	% of UAA
EU-15			
Smaller than 5 ha	3 087 110	54.5	4.4
Smaller than 8 ESU[a]	3 427 010	60.5	14.7
Less than 50% of output sold[b]	588 010	16.4	2.8
NMS-12			
Smaller than 5 ha	6 557 740	81.6	18.5
Smaller than 8 ESU[a]	7 677 200	95.5	42.9
Less than 50% of output sold[b]	5 300 410	65.9	21.5
EU-27			
Smaller than 5 ha	9 644 850	70.4	8.4
Smaller than 8 ESU[a]	11 104 210	81.1	22.5
Less than 50% of output sold[b]	5 888 420	43.0	12.8

Note: NMS = new member state; ESU = European size unit; UAA = utilised agricultural area.
[a] No data available for farms < 2 ESU for The Netherlands. This means that this figure is likely to be somewhat understated.
[b] For EU-15 data available for only Greece, Italy, and Spain; thus, aggregate for EU-27 is, here, NMS-12 plus EU-3.

Considering economic size, in 2007 there were 11.1 million farms smaller than 8 ESU within the EU-27. Of these, 6.4 million were smaller than 1 ESU. Expressed as a percentage, farms smaller than 8 ESU accounted for just over 80% of the total number of agricultural holdings in the EU-27. In six NMSs (Bulgaria, Hungary, Latvia, Lithuania, Slovakia, and Romania) farms below 8 ESU represented 95% or more of agricultural holdings. However, in view of the land area managed, the importance of SF and SSF is much more modest. In 2007 these farmers operated only 22.5% of the EU-27 UAA.

The market participation criterion, which is probably the most appropriate basis on which to produce a farm typology when subsistence production is involved, indicates big variations across EU-27, with divides East – West and North – South. Following this criterion, SSFs are of significance mainly in the NMSs and some southern EU-15 member states, notably Italy. In seven NMSs, most farms produce mainly for self-consumption. These are Slovakia, where in 2007 93% of the farms produced mainly for self-consumption, Hungary (83%), Romania (81%), Latvia (72%), Bulgaria (70%), and Slovenia (61%). Despite their prevalence in terms of the total number of farms, SSFs manage smaller shares of UAA.

4 Methodology

The research involved four interrelated methodological stages. The first stage focused on questionnaire design and data collection. The next step included the valuation of unsold output and the estimation of its contribution to total household incomes. The newly created variable income per capita including the valuation of subsistence production was used in the next two steps. The third step involved comparisons between key household and production characteristics of poor and nonpoor households and those who were shifted from below to above the poverty line due to the valuation of unsold output in order to identify variables that differentiate the groups. The fourth step identified homogeneous groups of farm households, using cluster analysis, to investigate whether there were systematic characteristics of households that were more dependent on subsistence production. This contributed to the formulation of more focused policy implications and conclusions.

4.1 Survey instrument and regional sampling

A questionnaire was devised to survey agricultural households in five EU NMSs. The survey focused on farm households, where a farm household is defined as a household with agricultural production, including production from a house garden or yards belonging to the house. Only farm households that had agricultural production in both 2006 and 2003 or in either of these two years were included in the survey sample. Although the information requested for 2003 was less detailed than that for 2006, the survey of the two time points allowed for the identification of households that entered or exited agriculture between 2003 and 2006 irrespective of whether they were semi-subsistence or commercial farms. Participation in the survey was determined by asking initial filter questions.

The questionnaire solicited information on household demographics, incomes and sources of incomes, factors of production, agricultural output, and variable inputs (in quantities and value). Answers to qualitative statements on five-point Likert scales generated an understanding of respondents' attitudes to farming and off-farm employment. As for this research market participation and the use of subsistence production to cover household food needs are of central importance, households were asked, first, to estimate the share of the total output sold and the share of the food consumption covered by own production and, second, to indicate their assessment of these shares on a product-by-product basis. The survey was implemented through face-to-face interviews using local enumerators.

The survey employed geographical cluster sampling. In the first stage three regions in each of the five surveyed countries were selected according to their degree of economic development: (i) lagging behind, (ii) average, and (iii) prosperous, corresponding to a gross domestic product (GDP) per capita below, similar to, and higher than the national average, respectively. The survey targeted rural areas, and for this reason the regions of the capital city and other large cities were excluded from the selection with the exception of Ljubljana, which does not constitute a Nomenclature of Units for Territorial Statistics 3 (NUTS 3) region. Eurostat data at the NUTS 3 level were used as a basis for this selection.[3] In the second stage, three villages per NUTS 3 region were selected (again with a view to cover the variations within the NUTS 3 regions—namely, a prosperous, average, and lagging-behind village in comparison with the regional mean). Figure 1 details the selected regions.

[3] The sample in Poland differed slightly from other countries in relation to the geographic selection criteria at NUTS 3 level. In Poland sampling overlapped with the sample for a survey conducted for a previous EU-funded research project 'Integrated Development of Agriculture and Rural Areas in Central and Eastern European Countries'.

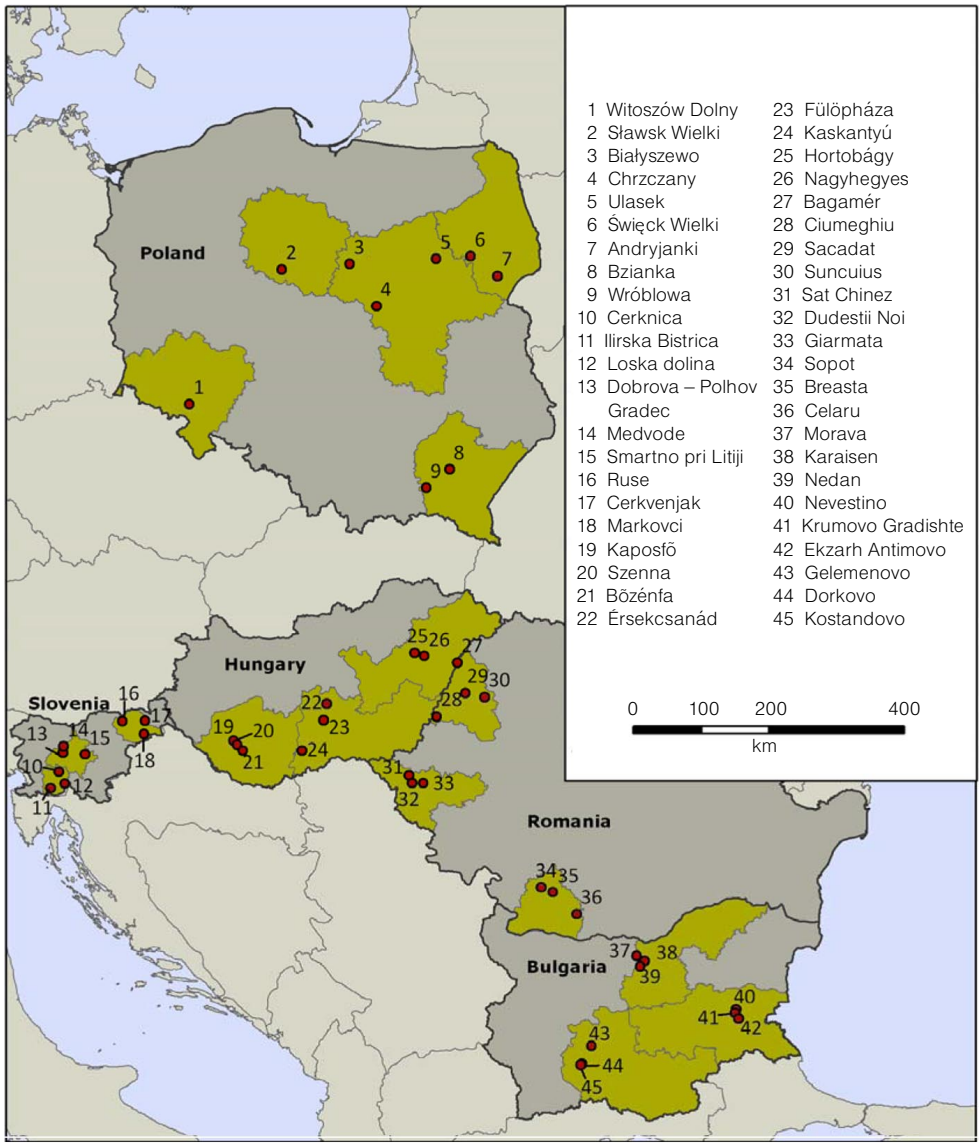

Figure 1. [In colour online.] Location of survey villages and regions (source: Baum, 2008; Eurostat, no date; © EuroGeographics for the administrative boundaries).

4.2 Valuation of output

The valuation of total agricultural output depended on using actual household selling prices. In cases where the household consumed all output produced, crops were valued using a weighted average price for the village. In cases where in a particular village there were only a few observations of output sold and there were large differences in reported prices, either regional averages or country averages were taken from national statistics.

An identical procedure was used to value unsold output. Product by product, it was valued at market prices as a proxy for opportunity costs. If a household sold a portion of their output, the same price was imputed to the unsold quantity as it was assumed that the price the household received was the best indication of the quality of the output. If the household did not report any sales of the product in question, the valuation procedure as explained above in relation to the total output was applied.

4.3 Identifying poor households

An important objective of this paper is to provide a more complete picture of household incomes by estimating the value of unsold output. Particular attention was paid to the importance of nonmarketed output for poor households. To define the latter, the Eurostat definition of 'at the risk of poverty' was used. It refers to individuals living in households where the equivalised income is below the threshold of 60% of the national equivalised median income.[4] Equivalised income is a household's total income divided by the equivalent size of the household.[5]

4.4 Household profiling

To better profile agricultural households and their livelihoods, cluster analysis was conducted to define groups with the maximum homogeneity within the groups and maximum heterogeneity between the groups (Hair et al, 2006). The cluster analysis followed a two-stage approach. First, because of its ability to form clusters based on both categorical and continuous data, the SPSS TwoStep cluster analysis procedure was used to discern the number of clusters and profile the cluster centres (Norušis, 2011). The TwoStep approach combines an initial preclustering procedure followed by hierarchical clustering of the preclusters. The decision on the number of clusters to retain was based on Bayesian information criterion. Then the observations were clustered utilising a nonhierarchical method (*k*-means) with the cluster centres from the TwoStep procedure used as the initial seed points. Nonhierarchical clustering requires the number of clusters to be predefined but in general is more reliable (in terms of similar results for split samples), and objects can switch between clusters (Everitt et al, 2001). The hierarchical clustering procedure provides the basis for deciding on the number of clusters in the second stage. This combined procedure thus allows one to draw benefits associated with both hierarchical and nonhierarchical methods, while at the same time minimising some of the drawbacks (Milligan, 1996; Punj and Stewart, 1983).

To produce the typology of agricultural households, variables were selected from the literature on sustainable livelihoods (Buchenrieder et al, 2007) relating to the five types of capital (financial, human, natural, physical, and social). Specifically, financial capital was captured in terms of total household cash income, equivalised income per capita excluding subsistence production, and equivalised income per capita including subsistence production. Age of the head of the household and the percentage of a household's time accounted for by off-farm work relate to human capital. The latter variable measures engagement in the nonfarm economy and indicates an ability to operate outside of agriculture (Ellis, 1993). Two variables capture natural capital: total cultivated area and land owned. The value of agricultural equipment is a measure of physical capital. Active membership in a marketing or purchasing agricultural cooperative was used as a measure of social capital (Svendsen and Svendsen, 2000). Measures of location (distance to nearest urban area in both kilometres and hours) were also included given the likely bearing on social capital (du Toit et al, 2007).

The validation of the clusters depended on an array of additional variables. This included variables characterising the household and agricultural activities. Particular attention is paid to gender. We also consider the incidence of poverty per cluster. Profiling of the clusters also covers labour allocation, capital and technology use, and

[4] The at-the-risk-of-poverty thresholds per capita were, in 2006: €1022 (Bulgaria), €2308 (Hungary), €1867 (Poland), €828 (Romania), and €5589 (Slovenia).

[5] The household equivalent size was calculated using the modified OECD equivalence scale, giving a weight of 1.0 to the first adult, 0.5 to any other household member aged 14 years and over, and 0.3 to each child. As the data from the five countries were merged all income indicators were converted into euros using Eurostat purchasing power parities for 2006, the reference year for the data collected.

the potential impact of policy measures on stimulating the formation of nonagricultural businesses. The capital and technology variables provide an insight into whether the households that are most dependent on subsistence agriculture rely almost exclusively on manual technology.

5 Results

5.1 Description of the sample

The sample consists of 1012 NMS households, all of which produced agricultural commodities in 2006. This figure comprises 214, 165, 199, 251, and 183 responses from Bulgaria, Hungary, Poland, Romania, and Slovenia, respectively. Table 2 provides an overview of the key household and production characteristics of the merged five-country sample.

Table 2. Descriptive statistics for the merged sample for the five analysed countries (2006).

	Min	Max	Mean	SD
Age of household head (years)	18	91	54.31	13.141
Time spent on-farm by household head (%)	0	100	74.25	35.995
Time spent on non-farm wage employment by household head (%)	0	100	18.82	32.144
Total number of household members	1	9	3.48	1.580
Total cultivated land area (ha)[a]	0	132	7.81	12.151
Distance to most distant plot (km)	0	80	3.75	5.400
Distance to nearest urban centre (km)	4	78	23.68	18.740
Total value of production (PPP€)	70	215 707	14 374	22 030.077
Total value of sales (PPP€)	0	215 707	9 926	18 668.749
Total value of subsistence production (PPP€)	0	209 478	4 448	8 932.772
Total cash income (PPP€)	0	119 337	17 000	15 500.275
Equivalised income per capita (PPP€) without subsistence production	0	52 264	7 910	6 887.373
Equivalised income per capita including subsistence production (PPP€)	183	68 627	9 962	7 860.460
Value of agricultural equipment (PPP€)	0	680 343	15 691	36 019.557
Share of sales in output (%)	0	100	50.71	32.726
Share of food consumption from own production (%)	0	100	44.45	26.569
Subsistence production contribution to total income (%)	0	100	22.56	18.573

Notes: PPP€ = purchasing power parities in euros; all monetary values have been converted from national currencies to PPP€ by applying Eurostat currency conversion rates for 2006.
[a] The case of no area cultivated is explained by the situation where the household keeps only livestock and does not cultivate crops.

As evident in table 2, the sample encompasses very small to relatively large holdings measured by land area, covering the whole spectrum from fully subsistence (0% sales) to fully commercial (100% sales). Also, the survey includes rural agricultural households who do not consume any of their produce themselves to households who claim they produce 100% of their own food. The mean farm size is 7.8 ha, and most farm within their local area—the average distance to household's largest plot is 2.4 km. The value of agricultural equipment, output, sales, subsistence production, and incomes vary substantially around the mean values, indicated by large standard deviations.

5.2 Incomes and nonmarketed output

The valuation of unsold output provides an indication of the contribution of SF to household income. Table 2 details that for the sample as a whole, on average, the equivalent value of subsistence food production is €4448 per household, accounting for, on average, 22.6% of household income. Adjusting for household size, equivalised income per capita in 2006 excluding and including subsistence production was €7910 and €9962, respectively. Turning to the measure of poverty, 15.1% of households can be classified as poor excluding the valuation of SF (table 3). Valuing nonmarketed output has a significant effect on the numbers classified as living in poverty. This adjustment leads to only 7% of the sample being classified as poor. Assessments of rural poverty are therefore sensitive to the valuation of subsistence production, and SF and SSF do make a significant contribution to household welfare.

Table 3. Household distribution by country (%).

	Poverty line excluding subsistence production		Poverty line including subsistence production	
	below	above	below	above
Bulgaria	26.6	73.4	8.9	91.1
Hungary	11.5	88.5	9.1	90.9
Poland	9.5	90.5	2.0	98.0
Romania	5.2	94.8	1.6	98.4
Slovenia	24.6	75.4	15.8	84.2
Sample total	*15.1*	*84.9*	*7.0*	*93.0*

Focusing on the importance of subsistence production at the country level, the analysed NMSs show large differences ranging from very little importance (Hungary) to a substantial impact on the rural poor (Bulgaria) (table 3). In Bulgaria, where the valuation of income in kind has the largest effect, almost two thirds of the poor households are shifted from below to above the poverty line when subsistence production is taken into account. The valuation of subsistence production also has a large impact for Slovenia, reducing the share of poor households from 24.6% to 15.8%. For these two countries subsistence production is very important but not enough to fully eradicate poverty. This is, however, the case for Poland and Romania, where the valuation of subsistence production reduces the already low shares of agricultural households below the poverty line to less than 2%. In Hungary, on the other hand, valuing subsistence production has only a modest effect in shifting households above the poverty line. It should be stressed, however, that the analysis presented in table 3 relates to relative poverty lines, which vary significantly between countries.

5.3 Characteristics of poor households

In order to produce an overview of variables that differentiate between poor and nonpoor households, analysis of variance was carried out. Table 4 compares the characteristics of households who were always below or above the poverty line and those who shifted groups as a result of the valuation of subsistence production. Concerning households who were always below or above the poverty line, the results indicate that heads of poor households have generally a lower education level and spend more time on-farm and less on nonfarm wage employment although they are located nearer to an urban centre. Poor households are also larger. For them, as expected, the relative contribution of subsistence production to household incomes is higher. With respect to production characteristics, households below the poverty line have smaller production assets (land, agricultural equipment) and consequently lower output level.

Table 4. Comparison of households below, above, and shifted above the poverty line by the valuation of subsistence production: sample merged for the five countries analysis of variance.

	Below poverty line ($n = 71$)	Above poverty line ($n = 859$)	Shifted poverty line ($n = 82$)	Total ($n = 1012$)	*F*-value	
Age of household head (years)	55.42	54.28	53.67	54.31	0.353	0.703
Education level of household head[a]	2.75	3.22	3.04	3.17	11.053	0.000***
Time spent on-farm by household head (%)	81.52	72.54	85.88	74.25	6.779	0.001***
Time spent on nonfarm wage employment by household head (%)	12.32	20.17	10.27	18.82	5.156	0.006***
Total number of household members	3.82	3.42	3.74	3.48	3.361	0.035**
Equivalised household size	2.32	2.13	2.26	2.15	3.473	0.031**
Total cultivated land area (ha)	4.39	8.34	5.18	7.81	5.617	0.004***
Distance to most distant plot (km)	2.33	3.91	3.30	3.75	3.123	0.044**
Distance to biggest plot (km)	1.83	2.55	1.53	2.41	4.743	0.009***
Size of biggest plot (ha)	1.52	2.90	1.71	2.71	4.650	0.010***
Share of sales in output (%)	39.68	53.29	33.28	50.71	18.990	0.000***
Share of food consumption from own production (%)	46.76	43.72	50.12	44.45	2.349	0.096*
Subsistence production contribution to total income (%)	24.35	20.36	44.08	22.56	69.763	0.000***
Total value of production (PPP€)	6227	15253	12221	14374	5.990	0.003***
Total value of sales (PPP€)	4693	10879	4475	9926	7.500	0.001***
Total value of subsistence production (PPP€)	1534	4374	7745	4448	9.553	0.000***
Value of agricultural equipment (PPP€)	7594	17135	9472	15691	2.740	0.065*
Distance to nearest urban centre (km)	20.68	23.45	28.68	23.68	3.922	0.020**
Household head female (%)	11.7	78.9	9.4	16.2	7.242	0.027**
Household head male (%)	6.2	85.9	7.9	83.8		

* Significant at the 10% level; ** significant at the 5% level; *** significant at the 1% level.
Notes: PPP€ = purchasing power parities in euros; all monetary values have been converted from national currencies to PPP€ by applying Eurostat currency conversion rates for 2006.
[a] Five education levels were recorded: 1 = no schooling, 2 = primary school, 3 = middle school, 4 = high school, 5 = university degree.

Poor households sell on average only 39.7% of their total output compared with 53.3% for nonpoor households. Using Wharton's (1969) thresholds, in general, poor households are subsistence oriented and nonpoor households are commercially oriented.

For this study of particular interest are those households shifted above the poverty line as a result of the valuation of unsold output. What characterises these households in comparison with the other two groups is that they spend the largest share of time on-farm and the lowest in nonfarm wage employment. They market the lowest share of output, and for them the contribution of subsistence production to household food consumption and to incomes is the most important.

5.4 Typology of agricultural households

Applying the clustering approach discussed above, a four-cluster solution was obtained (table 5). Tables 6 and 7 present the cluster validation variables, and table 8 describes the distribution of cluster membership by country and the share of total cultivated land area and value of production accounted for by each cluster. Table 9 details their objectives for agricultural production, the impact of potential policy initiatives on

the likelihood of establishing a nonagricultural business, and intentions of households, by cluster, for the period 2006 to 2011. Owing to missing data, the factor and cluster analysis incorporates 701 agricultural households.

Table 5. Cluster analysis: cluster profiling variables.

	Cluster membership				Mean
	1 ($n = 20$)	2 ($n = 61$)	3 ($n = 530$)	4 ($n = 90$)	($n = 701$)
Financial capital					
Total cash income (PPP€)	46 551	51 958	13 481	21 759	18 840
Income per capita excluding subsistence production (PPP€)	17 045	23 387	6 244	9 247	8 431
Income per capita including subsistence production (PPP€)	21 300	27 208	8 158	12 700	10 776
Human capital					
Age of head of the household	51	52	54	49	53
Household off-farm work, time allocation (%)	28.6	41.3	35.7	22.8	34.3
Natural capital					
Cultivated land area (ha)	32.58	20.80	5.80	17.07	9.33
Land area owned (ha)	22.32	11.40	5.15	14.20	7.36
Financial capital					
Value of agricultural equipment (PPP€)	124 179	17 071	5 635	39 728	14 426
Social capital					
Active membership of cooperative (%)	75.0	50.8	31.9	44.0	36.3
Distance to nearest urban centre (km)	13.1	15.5	13.4	15.0	13.8
Distance to nearest urban centre (hours)	0.29	0.30	0.26	0.30	0.27

Notes: PPP€ = purchasing power parities in euros; all monetary values have been converted from national currencies to PPP€ by applying Eurostat currency conversion rates for 2006.

Table 6. Continuous variables for cluster validation.

	Cluster				Mean	*F*-test
	1 ($n = 20$)	2 ($n = 61$)	3 ($n = 530$)	4 ($n = 90$)	($n = 701$)	
Size of biggest plot (ha)	6.6	6.9	2.4	4.2	3.1	17.6***
Subsistence production contribution to total income (%)	20.3	11.9	23.2	25.9	22.5	8.6***
Education level of household head	2.9	3.4	3.3	3.3	3.3	1.8
Number of household members	5.1	3.9	3.6	4.3	3.7	10.5***
Share of sales in output (%)	73.1	77.0	50.8	66.5	55.8	20.3***
Share of food consumption from own production (%)	44.6	35.3	43.2	35.8	41.6	3.0**
Total value of production (PPP€)	57 928	42 678	11 217	33 490	18 169	87.0***
Total value of sales (PPP€)	45 094	33 881	7 006	25 301	12 798	84.7***
Total value of subsistence production (PPP€)	12 834	8 797	4 212	8 190	5 371	10.3***
Workers to consumers ratio	0.70	0.73	0.65	0.68	0.67	1.3

** Significant at the 5% level; *** significant at the 1% level.

Notes: PPP€ = purchasing power parities in euros; all monetary values have been converted from national currencies to PPP€ by applying Eurostat currency conversion rates for 2006.

Table 7. Binary variables for cluster validation and share of cluster membership (%).

	Cluster membership				Mean
	1 ($n = 20$)	2 ($n = 61$)	3 ($n = 530$)	4 ($n = 90$)	($n = 701$)
Below poverty line					
Excluding subsistence production	5.0	0.0	19.2	14.3	16.5
Including subsistence production	0.0	0.0	7.9	5.5	6.7
Pushed above poverty line when including subsistence production	5.0	0.0	11.3	8.8	9.8
Household characteristics					
% Household head is female	10.0	18.0	14.5	13.2	14.5
No household member self-employed	70.0	83.6	93.6	85.7	91.0
No household member in wage employment	36.8	38.3	38.9	48.3	40.0
Income from agrotourism	5.0	1.6	0.4	2.2	0.6
Household member engaged in artisan or crafts	0.0	6.6	1.7	3.3	1.7
Household member engaged in food processing	0.0	1.6	1.9	4.4	1.8
Farming with household labour only	75.0	75.4	85.3	83.5	83.9
Use of credit and technical assistance					
Used credit for production and marketing	45.0	19.7	9.0	20.2	12.4
Technical assistance used	50.0	26.7	9.5	29.2	14.7
Main farming technology					
Own agricultural machinery	95.0	78.7	52.4	96.6	61.6
Other peoples' agricultural machinery	0.0	13.1	15.4	2.3	13.0
Manually	5.0	4.9	19.4	0.0	15.2
Orientation					
Commercial	100.0	86.9	57.5	81.3	64.3
Subsistence	0.0	13.1	42.5	18.7	35.7
Self-assessment of level of income					
Not enough for food and housing	5.0	9.8	23.0	4.4	19.0
Enough for food and housing only	30.0	27.9	41.5	33.3	38.9
Enough for food and housing and to cover some extra needs	50.0	50.8	31.4	50.0	36.1
Sufficient to cover a wide range of needs and live comfortably	15.0	11.5	4.0	12.2	6.0
Importance of contribution of own production to household welfare					
Not important	16.7	38.3	16.3	33.3	20.5
Very important	77.8	48.3	39.1	37.8	40.8
Essential for survival	5.6	13.3	44.6	28.9	38.7

The cluster analysis indicates two main routes out of poverty, represented by clusters 1 and 2. Cluster 2 (*pluriactive farmers*) is the richest: with a mean cash income (€51 958) more than double that of clusters 3 and 4. No one in this cluster is classified as poor regardless of whether subsistence production is accounted for (table 7). Most of these households combine farming with alternative, off-farm gainful activities and can be classified, therefore, as pluriactive (Kinsella et al, 2000). They operate relatively large farms (mean of 20.8 ha) compared with the sample mean (9.3 ha). The cluster devotes the highest proportion of household time to off-farm work, and the main motivation of farmers is to generate cash income. The value of production per hectare is the highest of any cluster. While accounting for 8.7% of the useable sample, these farms are responsible for 20.4% of the value of production. Some 18% of household

heads in this cluster are female, which is higher than any other cluster. The main objective in farming is to generate cash incomes. This cluster has a disproportionately large share of farmers from Hungary and Slovenia, the two countries in the sample with the highest GDP per capita (table 8).

Table 8. Cluster membership by country (%) and contribution of total production.

	Cluster membership				Total
	1 ($n = 20$)	2 ($n = 61$)	3 ($n = 530$)	4 ($n = 90$)	
Country membership within clusters					
Bulgaria	0.9	7.5	88.7	2.8	100
Hungary	2.5	13.6	65.4	18.5	100
Poland	0.9	4.4	76.7	18.1	100
Romania	2.3	9.1	81.8	6.8	100
Slovenia	9.5	14.6	56.9	19.0	100
Cluster total	2.8	8.7	75.5	13.0	100
Share of aggregated sample values					
Cultivated land area	9.9	19.4	46.9	23.7	100
Value of production (PPP€)	9.1	20.4	46.6	23.9	100
Value of agricultural equipment (PPP€)	24.5	10.3	29.5	35.7	100

Notes: PPP€ = purchasing power parities in euros; all monetary values have been converted from national currencies to PPP€ by applying Eurostat currency conversion rates for 2006.

Cluster 1 (*relatively large, full-time farms*) is the smallest one ($n = 20$), with the second highest mean cash income (€46 551). After accounting for nonmarketed production, no households in this cluster could be classified as poor. This cluster's farms are sufficiently large (mean operating size of 32.6 ha) to generate incomes to remove the households from poverty, without requiring additional off-farm income. The cluster is also asset rich not only with respect to land but also regarding agricultural machinery, and the value of machinery owned is over eight times the sample average. Moreover, three quarters are active members of a marketing or purchasing agricultural cooperative, and the use of both technical assistance and credit for production and marketing is far more widespread in comparison with other clusters. This cluster has the lowest share of female-run households—10%. This cluster has a disproportionately large share of Slovenian households and relatively few from Bulgaria and Poland. Similar to cluster 2, the main motive in agriculture for this cluster is to generate cash income (table 9).

The poorest cluster (cluster 3) is the largest ($n = 530$), accounting for 75.6% of the sample. *Undercapitalised and small-scale farms* characterise cluster 3. Most operate farms of less than 5 ha. As a result, this cluster accounts for three quarters of the useable sample but only 46.9% of total cultivated land area. The vast majority farm with only household labour. This cluster has the highest use of manual technology and the lowest mean value for physical assets. It also has the lowest workers to consumers ratio. It is disproportionately weighted to farms from Bulgaria and Romania, the two poorest countries in the sample. On average, only 50.8% of output is marketed, and over 42% of households are subsistence oriented. Subsistence production is critical to the welfare of members. Incomes from nonagricultural activities are rather modest, so that 44.6% and 39.1% classify own production as essential or very important for survival, respectively. Just under one fifth are below the poverty line when subsistence production is excluded. Households in this cluster have poor social capital since only 31.9% are active members of agricultural cooperatives. Different from the other clusters, only one

Table 9. Objective for agricultural production, favourability of potential policy initiatives and intentions for the period 2006 – 11 by cluster (% of cluster total).

	Cluster membership				Sample mean
	1 ($n = 20$)	2 ($n = 61$)	3 ($n = 530$)	4 ($n = 90$)	
Aims for agricultural production (1 = totally disagree, 5 = totally agree)					
To provide food for the household	3.60	3.67	4.15	3.64	4.03
To generate cash income	4.65	4.52	3.50	4.04	3.69
To enjoy farming	4.00	4.02	3.34	3.65	3.46
To transfer to the next generation	3.85	3.74	3.08	3.66	3.24
To provide work for household members	3.50	2.97	3.23	3.73	3.28
Policy initiatives					
% replying that measure would significantly increase likelihood of setting up new nonagricultural business					
Better information on business opportunities	20.0	21.3	28.9	24.2	26.9
Access to specific consulting service	20.0	23.0	27.4	25.3	25.9
Access to low cost finance	35.0	34.4	33.0	27.5	29.5
Improved physical infrastructure	5.0	23.0	27.5	25.3	25.5
Special development projects	30.0	32.8	34.0	38.5	32.3
Reduced insurance and tax burden	35.0	37.7	41.9	39.6	39.3
Better law enforcement	30.0	36.1	33.8	35.2	34.4
Intentions for 2006 – 11					
Objectives committing to farming					
To increase the share of sales	10.0	4.9	5.5	8.8	6.0
Intensify farming (increase labour/ resource input)	10.0	26.2	9.4	19.8	12.3
Specialise farming	15.0	6.6	2.6	4.4	3.6
Category total	35.0	37.7	17.5	33.0	21.9
Objectives to decrease farming					
To cease farming	0.0	0.0	7.7	5.5	6.6
To scale down farming	0.0	1.6	7.7	7.7	7.0
To retire	0.0	3.3	2.6	1.1	2.4
To transfer to the next generation	30.0	11.5	8.7	5.5	9.1
Decrease farming intensity (decrease labour/resource input)	0.0	0.0	1.3	1.1	1.1
Category total	30.0	16.4	28.0	20.9	26.2
No answer	0.0	0.0	1.9	0.0	1.4
No change	35.0	45.9	52.5	46.2	50.6

tenth are using credit and technical assistance. Their main motive for engaging in agriculture is to provide food for the household.

Cluster 4 operate similar-sized farms to those in cluster 2 (17.1 ha versus 20.8 ha) but with more than two times higher value of agricultural equipment. However, their average income per capita is less than 40% of those recorded by cluster 2. This is because their engagement in off-farm work is low—on average, less than one quarter of total household gainful activity is off-farm. Almost one half of households in this cluster register no household member in wage employment. This cluster can be characterised as relatively *medium-sized farms with significant underemployment*. Age is not a particular barrier to employment—this cluster registers the lowest average age of the head of the household (49). Prior to evaluation of subsistence production 14.3% can be classified as below the poverty line. A high proportion of farms in this cluster come from Poland and Slovenia, with Bulgaria and Romania underrepresented.

Most rate own production as either essential or very important to their survival, and their main aim for agricultural production is to generate cash income.

As mentioned previously, within the sustainable livelihoods approach it is recognised that actors partially shape their livelihoods (Ansoms and McKay, 2010) and that policy should enable households to improve their own well-being (DFID, 2000; Moser, 2007). In this context policy initiatives promoting pluriactivity and the creation of nonfarm businesses could help households to improve their situation. Regarding policy initiatives to improve livelihoods, table 9 details the percentage of members of each cluster who say that a potential support mechanism would significantly increase their propensity to set up a nonagricultural business. Overall, farmers are most likely to respond to a reduced insurance and tax burden and better law enforcement. Cluster 1 farms indicate that they are most likely to respond to the provision of low-cost finance. Cluster 3 farms, recording the highest incidence of poverty, report that they are most likely to respond to 'improved physical infrastructure', 'better information on business opportunities', and 'access to specific consulting service'. These ratings again underline their fairly poor social capital.

Larsen (2009) suggested that engagement in SSF may act as a basis for adding value through ancillary activities such as agrotourism, food processing, and artisan or craftwork. At present this is not happening on a wide-scale basis in the NMSs. Only six, thirteen, and fifteen sampled households engage in agrotourism, artisan or craft activities, and food processing, respectively. The group with the highest incidence of poverty (cluster 3) possesses the lowest level of engagement in agrotourism. Involvement in food processing and artisan or craft production is also modest. There may be mismatch between those most equipped to diversify into new business ventures and those most in need of enlarging their income base.

The bottom rows of table 9 detail the intentions of farmers over a five-year time period. Overall, one half envisaged no change, and this was the most popular response for all clusters. Only 21.9% of households intended to make further commitments to agriculture in the near future, while 26.2% envisaged reducing their involvement in agriculture, principally by transferring to the next generation or scaling down operations. Only 6.6% planned to cease farming altogether. Cluster 2 farms were most keen on increasing their involvement in agriculture (via intensification and specialisation), which is surprising bearing in mind their successful engagement in off-farm employment. In contrast, cluster 3 farms were most likely to envisage ceasing farming altogether. However, overall, the majority of households intended to pursue a similar level of agricultural activity in the future and produce a significant share of their own food needs.

6 Conclusions

The paper contributes to research on farming in the NMSs by drawing on the sustainable livelihoods literature and a relatively large and comprehensive dataset of over 1000 responses. The latter provides detailed information on agricultural households in contrasting rural regions of five countries (Bulgaria, Hungary, Poland, Romania, and Slovenia). The sustainable livelihood framework provides a useful approach to discern the different constraints faced by varying groups of farmers and their differing policy needs. The research generates four key conclusions relating to agricultural livelihoods.

First, subsistence production remains pervasive in the NMSs. Using Wharton's (1969) definition of subsistence farmers as those selling less than 50% of their output, 49.1% of those sampled can be classified as subsistence oriented (table 2). The prevalence of subsistence production is unlikely to change in the short to medium term—the majority of those sampled envisaged no change in their farming operations

in the next five years. Subsistence production should not be seen as merely a transitional phenomenon in Central and Eastern Europe—over twenty years after the downfall of socialist regimes it remains a critical characteristic of agriculture in the NMSs. However, there is little evidence that SF and SSF are currently providing a platform for additional value-added activities such as agrotourism, food processing, and artisan or craft activities.

Second, the contribution of subsistence production to livelihoods is uneven but significant. The equivalent value of subsistence food production is €4448 per household, accounting for, on average, 22.6% of the incomes of sampled households (table 2). For the sample as a whole the valuation of subsistence production pushes 8% of households above the poverty line (equivalent to roughly one half of those classified as poor prior to the valuation of such production). Given the large number of small-scale farms in the NMSs, this is an important finding. Estimations of poverty are sensitive to the valuation of nonmarketed production. Behind the above averages, country differences in the role of SF are significant. This research indicates that the impact of nonmarketed production for moving households above the poverty line is strongest in the poorest member state (Bulgaria).

Third, subsistence production is most important for the poorest households (cluster 3). The poorest households engage in SF as a survival strategy: 80% of respondents in cluster 3 rated own production as very important or essential for survival. In contrast, the respective figure for cluster 2 was 62%. Those with the most vulnerable livelihoods face a mixture of challenges. Cluster 3 operates small-scale, undercapitalised farms without substantial nonagricultural earnings. It has the highest mean age of the head of household. These farmers are unlikely to obtain new sources of income and will probably depend increasingly on social safety nets. Overall, they are reluctant, however, to give up farming altogether. The poorest (clusters 3 and 4) also possess poor social capital.

Finally, the analysis reveals the on-going distinctiveness of farming in the NMSs compared with structures in Western Europe. Cluster 1 has a mean farm size of 32.6 ha and agricultural equipment worth €124 179. Such farms roughly equate to what would be considered a medium-sized family farm in some Western European countries. It is the latter group which is central to the 'European model of farming' and the traditional focus of the CAP (Brookfield and Parsons, 2007). However, cluster 1 accounts for only 2.9% of the analysed sample. Most agricultural households studied, as well as land cultivated, do not fit with notions of what constitutes a typical family farm in Western Europe. While cluster 3 accounts for the majority of those sampled, owing to the relatively small size of the farms, such households are not the main beneficiaries of CAP direct payments (Davidova, 2011b), which for the most part in the NMSs are currently paid on a simple per hectare basis. While a central objective of the CAP remains to ensure a "fair standard of living for the agricultural community" (European Commission, 2009), current policy is unsuited to the large subsistence and semisubsistence sector in the NMSs. It is likely that farmers in cluster 3 require a different set of nonstandard measures targeted at their differing needs. This is likely to involve decreasing the costs to access information and improving social capital in rural areas, special development projects, sources of micro and low-cost finance, and improved synergies between agricultural, regional, and social welfare policies.

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References

Ansoms A, McKay A, 2010, "A quantitative analysis of poverty and livelihood profiles: the case of rural Rwanda" *Food Policy* **35** 584 – 598

Ashley C, Carney D, 1999 *Sustainable Livelihoods: Lessons from Early Experience* Department for International Development, London

Balint B, Wobst P, 2006, "Institutional factors and market participation by individual farmers: the case of Romania" *Post-communist Economies* **18** 101 – 121

Baum S, 2008, "Deliverable 3.2: socio-economic, demographic, and agricultural patterns of rural areas in the new member states", EU FPVI Project SCARLED, Contract No. SSPE-CT-2006-0044201 (STREP), http://www.scarled.eu/uploads/media/SCARLED_D3.2.pdf

Bird K, Shepherd A, 2003, "Livelihoods and chronic poverty in semi-arid Zimbabwe" *World Development* **31** 591 – 610

Boel M F, 2005, "European agriculture in 2010", Speech to LTO Nederland, http://europa.eu/rapid/pressReleasesAction.do?reference=SPEECH/05/316&format=HTML&aged=1&language=EN&guiLanguage=en

Bouahom B, Douangsavanh L, Rigg J, 2004, "Building sustainable livelihoods in the Laos: untangling farm and non-farm" *Geoforum* **35** 607 – 619

Brookfield H, Parsons H, 2007 *Family Farming, Survival and Prospect: A World-wide Analysis* (Routledge, Abingdon, Oxon)

Buchenrieder G, Möllers J, Happe K, Davidova S, Fredriksson L, Bailey A, Gorton M, Kancs d'A, Swinnen J F M, Vranken L, Hubbard C, Ward N, Juvančič L, Milczarek D, Mishev P, 2007, "Conceptual framework for analysing structural change in agriculture and rural livelihoods", Deliverable 2.1, SCARLED (Structural Change in Agriculture and Rural Livelihoods), http://www.scarled.eu/uploads/media/SCARLED_D2.1_01.pdf

Burrell A, 2009, "EC Conference on Rural Poverty and Social Exclusion 1: Contribution of rural development policies to social inclusion", discussion, Budapest, 11 June, http://ec.europa.eu/social/main.jsp?catId=88&langId=en&eventsId=158&moreDocuments=yes&tableName=events

Chambers R, Conway G R, 1991, "Sustainable rural livelihoods: practical concepts for the 21st century", DP 296, Institute of Development Studies, University of Sussex, Brighton

Council Regulation No. 1698/2005, "Council Regulation (EC) No. 1698/2005 of 20 September 2005 on support for rural development by the European Agricultural Fund for Rural Development (EAFRD)", http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2005:277:0001:0040:EN:PDF

Davidova S, 2011a, "Semi-subsistence farming: an elusive concept posing thorny policy issues", Presidential address *Journal of Agricultural Economics* **62** 503 – 524

Davidova S, 2011b, "Implementation of single area payment scheme in the EU new member states", in *The Common Agricultural Policy after the Fischler Reform: National Implementation, Impact Assessment and the Agenda for Future Reforms* Eds A Sorrentino, R Henke, S Severini (Ashgate, Farnham, Surrey) pp 107 – 120

Davidova S, Fredriksson L, Bailey A, 2009, "Subsistence and semi-subsistence farming in selected EU new member states" *Agricultural Economics* **40** 731 – 742

DFID, 2000 *Sustainable Livelihoods: Current Thinking and Practice* Department for International Development, London

du Toit A, Skuse A, Cousins T, 2007, "The political economy of social capital: chronic poverty, remoteness and gender in the rural Eastern Cape" *Social Identities* **13** 521 – 540

Ellis F, 1993 *Peasant Economics: Farm Households and Agrarian Development* 2nd edition (Cambridge University Press, Cambridge)

Ellis F, 2000 *Rural Livelihoods and Diversity in Developing Countries* (Oxford University Press, Oxford)

Ellis F, Mdoe N, 2003, "Rural livelihoods and poverty reduction in Tanzania" *World Development* **31** 1367 – 1384

Ellis F, Kutengule M, Nyasulu A, 2003, "Livelihoods and rural poverty reduction in Malawi" *World Development* **31** 1495 – 1510

European Commission, 2009 *Mission Statement: Directorate-General for Agriculture and Rural Development* (Commission for the European Communities, Brussels)

European Commission, 2010,"The Common Agricultural Policy after 2013 public debate: summary report", European Commission, Brussels http://ec.europa.eu/agriculture/cap-post-2013/debate/report/summary-report_en.pdf

Eurostat, 2009a, "Eurostat agriculture database", http://epp eurostat.ec.europa.eu/cache/ITY_SDDS/EN/ef_esms.htm

Eurostat, 2009b, "Ad hoc tables: farm structure survey", http://epp eurostat.ec.europa.eu/portal/page/portal/agriculture/data/ad_hoc_tables_farm_structure_survey
Eurostat, no date, "Regions and Cities database", http://epp.eurostat.ec.europa.eu/portal/page/portal/region_cities/regional_statistics/data/database
Everitt B S, Landau S, Leese M, 2001 *Cluster Analysis* 4th edition (Arnold, London)
FAO, 2010, "FAOSTAT", Food and Agriculture Organization, http://faostat.fao.org/default.aspx
Forgacs C, 2010, Semi-subsistence farming situation and policy: the example of Hungary", presentation at ENRD seminar "Semi-subsistence farming in the EU: current situation and future prospects", Sibiu, Romania, 13 – 15 October, http://enrd.ec.europa.eu/en-rd-events-and-meetings/enrd-seminars/semi-subsistence-seminar/en/semi-subsistence-seminar_home_en.cfm
Fritzsch J, Wegener S, Buchenrieder G, Curtiss J, Gomez y Paloma S, 2009, "Semi-subsistence farm households in Central and South-eastern Europe: current state and future perspectives", paper presented at the International Association of Agricultural Economists Conference, Beijing, China, 16 – 22 August, http://ageconsearch.umn.edu/handle/51444
Gorton M, Douarin E, Davidova S, Latruffe L, 2008, "Attitudes to agricultural policy and farming futures in the context of the 2003 CAP reform" *Journal of Rural Studies* **24** 322 – 336
Hair J F, Anderson R E, Tatham R L, Black B C, 2006 *Multivariate Data Analysis* 6th edition (Pearson Education, London)
Hubbard C, Gorton M, 2011, "Placing agriculture within rural development: evidence from EU case studies" *Environment and Planning C: Government and Policy* **29** 80 – 95
Kinsella J, Wilson S, de Jong F, Renting H, 2000, "Pluriactivity as a livelihood strategy in Irish farm households and its role in rural development" *Sociologia Ruralis* **40** 481 – 496
Kostov P, Lingard J, 2002, "Subsistence farming in transitional economies: lessons from Bulgaria" *Journal of Rural Studies,* **18** 83 – 94
Kostov P, Lingard J, 2004, "Subsistence agriculture in transition economies: its roles and determinants" *Journal of Agricultural Economics* **55** 565 – 579
Larsen A F, 2009, "Semi-subsistence producers and biosecurity in the Slovenian Alps" *Sociologia Ruralis* **49** 330 – 343
Lerman Z, 2001, "Institutions and technologies for subsistence agriculture: how to improve commercialisation", WP 8.01, Department of Agricultural Economics and Management, The Hebrew University of Jerusalem
McConnell D, Dillon J, 1997, "Farm management for Asia: a systems approach", Farm Systems Management Series 13, Food and Agriculture Organization, Rome
Mathijs E, Noev N, 2004, "Subsistence farming in Central and Eastern Europe: empirical evidence from Albania, Bulgaria, Hungary and Romania" *Eastern European Economics* **42**(6) 72 – 89
Milligan G W, 1996, "Clustering validation: results and implications for applied analyses", in *Clustering and Classification* Eds P Arabie. L J Hubert, G De Soete (World Scientific, River Edge, NJ) pp 341 – 375
Moser C, 2007, "Assets and livelihoods: a framework for asset-based social policy", in *Assets, Livelihoods and Social Policy* Eds C Moser, A Dani (World Bank, Washington, DC) pp 43 – 81
Norušis M J, 2011 *IBM SPSS Statistics 19: Statistical Procedures Companion* (Pearson Education, Harlow, Essex)
Papadopoulos A G, Liarikos C, 2007, "Dissecting changing rural development policy networks: the case of Greece" *Environment and Planning C: Government and Policy* **25** 291 – 313
Petrovici D, Gorton M, 2005, "An evaluation of the importance of subsistence food production for assessments of poverty and policy targeting: evidence from Romania" *Food Policy* **30** 205 – 223
Punj G, Stewart D, 1983, "Cluster analysis in marketing research: review and suggestions for application" *Journal of Marketing Research* **20** 134 – 148
Svendsen G L, Svendsen G T, 2000, "Measuring social capital: the Danish co-operative dairy movement" *Sociologia Ruralis* **40** 72 – 86
Swain N, 1999, "Agricultural restitution and co-operative transformation in the Czech Republic, Hungary and Slovakia" *Europe – Asia Studies* **51** 1199 – 1219
Wharton C R, 1969, "Subsistence agriculture: concepts and scope", in *Subsistence Agriculture and Economic Development* Ed. C R Wharton (Frank Cass, London) pp 12 – 20