



Economic prospect for semi-subsistence farm households in EU New Member States

Authors: Jana Fritsch, Stefan Wegener, Gertrud Buchenrieder, Jarmila Curtiss and Sergio Gomez y Paloma

Editor: Alison Burrell



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Abbreviations and Acronyms

base	Baseline scenario
BGN	Bulgarian Lev, 1 BGN=0.51387 EUR in 2006 (OANDA 2007)
CAP	Common Agricultural Policy
CEE	Central and Eastern Europe
CEEC	Central and Eastern European Countries
dca	Decar (equal to 1,000 square metre or 0.1 ha)
DFID	Department for International Development
dt	100 kilogramme
EBRD	European Bank for Reconstruction and Development
EC	European Commission
ESF	European Social Fund
ESSQ	Error Sum of Squares
ESU	European Size Unit, 1 ESU=1,200 EUR standard gross margin
EU	European Union
EUR	Euro
FADN	Farm Accounting Data Network
FAO	Food and Agriculture Organization of the United Nations
FAPRI	Food and Agricultural Policy Research Institute
farm	Farm development without semi-subsistence support
farm+self	Farm development and start self-employment without semi-subsistence support
farm+self+tss	Farm development and start self-employment with semi-subsistence support
farm+tss	Farm development with semi-subsistence support
FDI	Foreign Direct Investment
GAEC	Good Agriculture and Environmental Conditions
GAMS	General Algebraic Modeling System
GDA	General Directorates for Agriculture in Romania
GDP	Gross Domestic Product
ha	Hectare
IAMO	Leibniz Institute of Agricultural Development in Central and Eastern Europe
IMF	International Monetary Fund
INS	Institutul National de Statistica (Romanian National Institute of Statistics)

IPTS	Institute for Prospective Technological Studies
IQR	Interquartile range
km	Kilometre
l	Litre
LAG	Local Action Group
LFA	Less-favoured areas
LP	Linear programming
LU	Labour units
MAF	Ministry of Agriculture and Forestry of Bulgaria
MARD	Ministry of Agriculture and Rural Development (Poland)
MOLP	Multiobjective linear programming
MS	Microsoft
NC	National currency
NIS	National Institute for Statistics (Romania)
NMS	New Member States
No.	Number
NPRD	National Plan for Rural Development
NSP	National Strategic Plan
NUTS	Nomenclature des unités territoriales statistiques
OLS	Ordinary Least Squares
P25	25th percentile
P5	5th percentile
P75	75th percentile
P95	95th percentile
PLN	Polish Złoty, 1 PLN=0.2575 EUR in 2006 (OANDA 2007)
RD	Rural Development
RDP	Rural Development Program
retire	Stop agriculture -Early retirement scenario
RGA	Recensământul General Agricol (General Agricultural Census)
RHS	Right hand site
ROL	Romanian New Lei, 1 ROL=0.2848 EUR in 2006 (OANDA 2007)
SAPARD	Special Accession Programme for Agriculture and Rural Development
SAPS	Single Area Payment Scheme

self	Start self-employment without semi-subsistence support
self+tss	Start self-employment with semi-subsistence support
SFA	State Fund Agriculture (Bulgaria)
SFH	Semi-subsistence Farm Households
SME	Small and Medium-scale Enterprises
SO	Strategic Objective
SWOT	Strengths, Weaknesses, Opportunities, and Threats
TSS	Transitional semi-subsistence support measure
UAA	Utilised Agricultural Area
USD	US Dollar
WTO	World Trade Organization

■ Executive Summary

Farmers in Central and Eastern Europe (CEE), especially semi-subsistence farm households (SFHs), have to make a host of decisions relating to their income-creating activities. SFHs, although often unprofitable from a farm business perspective, have persevered over time. Not all reasons for their persistence are understood yet, but it is generally agreed that such households were important in providing food and shelter during economic disruptions of the transition period for both resident families, and even urban-based relatives. There is an ongoing debate about what could prompt SFHs to become more profitable or to leave farming. Such developments would foster structural change in the agricultural sector and the rural economy at large. A number of policy measures address this issue and, in the context of the most recent enlargement of the European Union (EU), a special transitional semi-subsistence measure was introduced to promote development of the smallest agricultural holdings into commercialised private farms.

In light of the above, the European Commission (EC) asked the Institute for Prospective Technological Studies (JRC-IPTS) to launch the S-FARM (Sustainability of Semi-Subsistence Farming Systems in New Member States and Accessing Countries) project. The aim of this project, begun in spring 2007, was to carry out a socio-economic analysis of SFHs in Poland, Romania, and Bulgaria and to analyse the impact of the EU rural development policy on SFHs.

Objectives of the S-FARM study

The study has two main objectives:

- (1) to analyse the current state of socio-economic sustainability of SFHs and identify the main types of SFH, and

- (2) to assess the impact of the 2005 EC Rural Development Measures on SFHs' socio-economic sustainability.

Literature review

SFHs are characterised as poorly endowed with land, capital, and human capital but they dispose of plenty of labour. Households mainly insist on their traditional way of life and seek to maintain their current livelihood. In addition to their current economic precariousness, there is a good chance that developments in the agri-food chain will further marginalise them.

Functioning factor markets, access to product markets, and provision of agricultural extension services are undisputed preconditions for commercialisation of SFHs. Nevertheless, some authors recommend addressing the underlying reasons for semi-subsistence production first. Non-farm income opportunities, secure food supply, and a reliable social security system would ease households' need to produce food for their own consumption, thus changing these households' objectives and aims. This view is a reminder that care should be taken with policy measures that tend to fix in place the current production and farm structures. In addition, the heterogeneity of small farms producing wholly or partly for their own consumption means that different policy approaches for different household types are likely to be needed.

The literature provides little evidence that the agricultural subsistence sector will diminish in the near future. Farm development will be an option for younger farmers operating larger farms. Furthermore, empirical data indicate a perverse supply response of small-scale farm households to price incentives when neo-classical theory

is applied. More sophisticated approaches consider not only the production but also the consumption side of the farm household, and relax neo-classical theory by employing various assumptions in their models. Most recently, risk aversion, market failures and transaction costs have gained prominence. All these explanations, however, only address the economic aspects of SFHs, although there are good reasons to assume that small-scale farm households are also driven by non-economic factors.

Following the discussion in the literature, this study combines the economic perspective with non-economic considerations. It is assumed that SFHs act rationally within their given constraints but additionally, socio-psychological aspects are considered. Using this approach, the study has identified different types of households for which various development strategies are analysed.

Methodological framework

This report analyses data from household surveys conducted in three case study countries in 2007. A total of 544 households, (175 in Poland, 184 in Romania, and 185 in Bulgaria), were interviewed in person using a structured in-depth questionnaire. Selecting appropriate farm households was a challenge because the term ‘semi-subsistence’ lacks a generally accepted definition. According to EU law, SFHs are defined as “agricultural holdings which produce primarily for their own consumption and also market a portion of their output” (European Commission Regulation 1698/2005, Article 34(1)). This definition is not very precise and it is up to the EU member states to adapt it to their national conditions. For this study, and based on the definitions in the national Rural Development Plans, a SFH was defined as an agricultural holding of size 1-4 ESU¹. In addition, this SFH had to market part of its agricultural production.

To address the first objective of the study, a two-step cluster analysis was applied, using Ward’s method for the first stage and the *k*-means procedure for the second stage. Outliers were excluded from the analysis, which resulted in a final sample of 489 households (158 households from Poland, 153 from Romania, and 178 from Bulgaria). Clusters were characterised in terms of ‘SFH types’, and then compared (across types and countries) in terms of their economic performance and other features.

For the second objective, a multi-objective linear programming (MOLP) technique was used. Programming models typically optimise only one objective function. However, SFHs normally follow more than just one livelihood strategy. For example, as well as maximising farm profit, the continuity of food availability and the diversification of income sources are also relevant to decisions of SFHs. The MOLP model is used in this study to allow additional objectives to be explicitly included in the optimisation routine. The model was constructed in GAMS². The simulations were conducted for specific, real households from the survey, so that each surveyed country is represented by one household per SFH type in the simulation.

The model represents three household income activities: farming, dependent employment, and self-employed activities, and optimises the following four model objectives: net agricultural production, net non-farm income, household cash balance, and agricultural labour input. The first three objectives were maximised and the last one minimised.

A farm household model has to take account of various income sources, together with their costs and labour use, and different expenditure categories in order to derive the household’s cash balance. Building simulation models for individual households requires the calculation of specific parameters, like household

¹ Farm size in the EU is measured in European Size Units (ESU), 1 ESU = 1,200 EUR of standard gross margin.

² GAMS: General Algebraic Modeling System.

expenditures, incomes and labour capacities, which are integrated in the model as coefficients and capacity constraints. This basic parametric specification was calculated using data from the household survey and from statistical yearbooks.

Moreover, simulation results are conditioned by simulation parameters, which represent future developments, e.g. for costs of paid labour or incomes. These parameters were based on real GDP growth projections by FAPRI³ for each surveyed country and on the assessments of national experts.

Each simulated scenario corresponds to a different SFH strategy, defined in terms of the household's choice of a particular policy measure or set of measures. The following five policy measures were combined for the scenarios:

- Single area payment scheme (SAPS),
- Farm investment support for the modernisation of agricultural holdings,
- Support for diversification into non-agricultural activities,
- Early retirement support, and
- Transitional semi-subsistence support.

A **baseline scenario** was calculated for each type of SFH in each country. The baseline scenario is interpreted as the situation in 2016 when direct payments (SAPS) are implemented at 100% of the agreed level in all three countries but no rural development measures are adopted. Hence, the baseline scenario can be interpreted as the strategy “continue as at present”. Decision scenarios involve the household in adopting one or more of the four rural development measures listed above. The decision scenario **farm development** supposes that the household invests in farming activities and receives support from the relevant policy measures. In the decision scenario **start self-employment**, it is assumed that the household diversifies by starting a self-

employed non-farming activity, receiving support from the respective policy measures. The decision scenario **farm development and start self-employment** assumes that the household invests in farming *and* diversifies into non-farming self-employed activities. The decision scenario **stop agriculture** assumes that the farm operator stops farming activities and receives the relevant payments from the early retirement scheme. In addition, all decision scenarios that do not imply giving up farming activities are calculated in two variants: (i) with and (ii) without transitional semi-subsistence support.

Each SFH model calculates the optimal activity levels for each scenario, given its parameters and the objective functions. A comparison of the results of the scenarios with those of the baseline shows what the consequences would be if the SFH in question opted for the measure or combination of measures assumed in the respective scenario. The focus of the discussion is on the comparison of household cash balances across the different decision scenarios, showing the effect of the transitional semi-subsistence support measure and which decision strategy would be the most beneficial option for each household type in the future.

Main findings

Current state and typology for SFHs

Four types of SFHs could be identified by means of cluster analysis: (1) rural non-farm oriented households, (2) rural pensioners and deprived households, (3) large-scale semi-subsistence farm households, and (4) rural households with undeveloped potential. These household types are statistically distinct from each other and show clear differences with respect to household, farm, and behavioural characteristics as well as in their external environment and viability.

3 FAPRI: Food and Agricultural Policy Research Institute.

Rural non-farm oriented households (in short, 'rural diversifiers', N=150)

Rural diversifiers are characterised by the greatest share of net non-farm income in net household income and the highest level of formal schooling, which may well be a precondition for non-farm employment. They have the largest share of own-consumed agricultural production in total agricultural production. This fits well with the fact that they produce a larger number of agricultural products than the other SFH types (subsistent households must produce a wide range of products to meet family food needs). They also have a low share of social security benefits in net household income.

Rural pensioners and deprived households (in short, 'rural pensioners', N=83)

The rural pensioner households have the oldest farm operators and the highest dependency ratio. The farm operators have many years of experience in managing a farm but they also have the least agricultural qualifications and they operate the smallest farms. On the one hand, they have the highest share of social security benefits in household net income, and on the other hand, their share of net non-farm income is the lowest.

Large-scale semi-subsistence farm households (in short, 'farmers', N=153)

Farmer households operate the largest farms. They produce relatively more crop products than animal products, and are better integrated into the agricultural product market than other SFH types. Farmer households also had the largest annual cash balance in 2006.

Rural households with undeveloped potential (in short, 'rural newcomers', N=103)

This SFH type has the youngest household heads and has very little experience in farm management. They had the lowest annual household cash balance in 2006 and their level

of formal schooling is very low. There seems to be considerable potential for future improvement of their socio-economic situation.

The impact of the EU Rural Development Measures on SFHs

When a household embarks on a strategy of "continuing as at present", e.g. **no rural development measure is adopted**, rural pensioners – regardless of the survey country – will be worse off in 2016 than in 2006. Nevertheless, it seems to be a feasible strategy for all other SFH types in Poland and Bulgaria, as for them the cash balance increases relative to the cash balance in 2006. An exception is Romania, where only rural diversifiers are better off when continuing their current activities unchanged, and yet for this type of SFH, the household cash balance remains negative.

Alternatively, households could cease farming and apply for **early retirement** support. This strategy would worsen the cash balance situation for nearly all types of households compared to the baseline scenario. Only rural diversifiers and rural newcomers in Poland, as well as Bulgarian rural pensioners, could improve their situation by embarking on this strategy. However, due to the average age of the rural newcomers (35 years) and of the rural pensioners (65 years), the majority of SFHs belonging to these types are not eligible for the early retirement measure. Hence, early retirement is a feasible option for the Polish rural diversifiers only. All other simulated SFHs are either not eligible for early retirement or are not able to compensate by other income sources for the income loss from giving up farming.

Another alternative strategy would be to **start a non-farm self-employed income activity**. This would be a favourable strategy for all simulated Bulgarian SFH types, while it would worsen household cash balances for all Polish SFHs. In Romania, only farmers would be worse off when embarking on this diversification strategy. However, setting up a non-farm business is a challenging task that only a few households could manage. In particular, rural

pensioners, who have a high average age, and for rural newcomers, who on average have a low education level, setting up a family business hardly seems a feasible option. Thus, income diversification by means of self-employment cannot be considered a universal remedy for SFHs.

The **farm development** strategy seems to be a sound one for households already engaged in farming. Most of the simulated households could profit from a farm development strategy. The only exception is the Romanian rural newcomers.

Simulation results show that the **transitional semi-subsistence support measure** does not have an impact on the allocation of individual household labour or the household's activity levels in any of the scenarios that imply farm development. In these scenarios, the effect of the measure is simply to increase the household cash balance by exactly the 100 EUR that were assumed in the model to be the net return from investing the payment in the farm. Hence, in most of the simulated scenarios, transitional semi-subsistence support increases the household cash balance by the profit that is gained from its investment.

As the transitional semi-subsistence measure is implemented in the countries on the condition that the economic farm size increases, in all scenarios including the semi-subsistence payment it was assumed that the household has to maintain at least the level of farming that it had in 2006. This condition causes a deeper impact of the payment in the diversification scenarios, by influencing the allocation of household labour: in diversification scenarios without the semi-subsistence payment, all households except the SFH type 'farmers' and the Bulgarian rural diversifiers allocate more individual household labour away from the farming activity to a non-farm activity than in the diversification scenario with the payment, changing household cash balances by amounts that differ from the assumed net return of 100 EUR.

Specifically, where the household prefers non-farm activities but its income per working unit from

farming exceeds income from non-farm activities, its net surplus is higher when diversification with semi-subsistence support constrain it to go on farming. In these cases, households are distracted from non-farm activities when participating in the measure and are kept in farming, which results in higher cash balances. However, these households have rational reasons for their specific preference for non-farm income and the cash balance criterion *per se* does not reflect these reasons.

However, the reverse situation could also be observed. When households whose income per working unit from farming is lower than the income from non-farm activities participate in the measure, the transitional semi-subsistence measure keeps household resources in farming that could otherwise earn a higher cash surplus outside agriculture.

The strategies resulting in the highest household cash balances for **rural diversifiers** are starting a non-farm self-employed activity and farm development, whereas continuing as at present or early retirement would result in the lowest household cash balances. Polish rural diversifiers are an exception to this rule. For them, early retirement and farm development result in the highest cash balances, whereas starting a non-farm self-employed activity is the only strategy yielding a negative cash balance.

Rural pensioners are not viable in any of the simulated decision scenarios. The only exceptions are the Bulgarian household if it opts for early retirement or self-employment, and the Polish household if it chooses farm development. Moreover, farm development is the only strategy that increases the cash balance of all simulated rural pensioner households. However, given the age of rural pensioners (median age of 65 years) and their difficult income situation, farm development or starting a family business would possibly be too demanding for most households of this SFH type. Moreover, most rural pensioner households are not eligible for the early retirement measure because they are over the age limit.

Simulation results show that the SFH type of **farmers** progresses best under the farm development scenario, which yields higher cash balances than the other scenarios. Alternatively, continuing as at present is also a feasible option, whereas early retirement results in the lowest cash balances.

For **rural newcomers**, starting non-farm self-employment and farm development are the strategies that provide the highest household cash balances, while continuing as at present and early retirement result in the lowest cash balances. However, the results are different for the Polish rural newcomer household, which achieves its highest cash balance in the farm development scenario and the next-best, still positive result with early retirement. Starting self-employment would result in the most negative cash balance among all strategies for the Polish SFH. As the average age of rural newcomers is low (35 years), most households of this type are not eligible for the early retirement measure. Furthermore, the low educational level of rural newcomer households does not favour the challenging option of starting a non-farm self-employed activity.

Policy pointers

The following policy recommendations can be derived from the above findings.

Rural diversifiers and pensioners: Sectoral policies may be less appropriate than social policies

Rural diversifiers are not doing extremely well, but they earn enough income from waged employment and farming to earn a livelihood. As they tend to be relatively well educated, it is reasonable to assume that this SFH type can keep its status quo until retirement, particularly because retirement is close for the majority (average age of 54 years). The recommendation would be to leave them alone but prepare the ground for them to enjoy a poverty-free retirement.

Rural pensioners were found to be non-viable under most scenarios. Given their high average age, a well-functioning and generous social security system seems to be most beneficial for them. Since they mostly have a negative cash balance, their pensions should initially increase faster than average economic growth to compensate for their difficult initial situation.

Farmers and rural newcomers: Sectoral policy measures and improving employability may succeed

SFHs classified as farmers possess the greatest development potential. Even now, without additional policy measures, these households are mostly in a comparatively good situation. Nevertheless, the farm investment measure could help them grow and prosper further. However, the average age of farm owners is quite high at 50 years. Thus, for this type of farm, the question of how to make the farm attractive to a potential successor and/or pension programme should also be addressed. Overall, sectoral policy measures can greatly benefit this type of SFH.

Similarly, rural newcomers should be the focus of policy measures because they are relatively young but lack professional training with regard to farming activities. Their employability in the non-farm sector is also rather limited. If they continue as they are doing at present, their socio-economic situation will further degrade. It would be in their best interest, on the one hand, to improve their employability in the non-farm labour market. On the other hand, in order to be able to operate an economically successful farm, they need advice on investment and production strategies as well as marketing ideas.

One-size-fits-all versus customised measures?

The study shows that farm development improves cash balances for most SFHs. Early retirement is the least favourable strategy due to a lack of other income sources that could

compensate for losses incurred by giving up farming. Starting a **self-employed activity** would also be a good option in terms of income, however only a few SFHs may be in a position to take up this opportunity. This is due to several factors. First, the formal rural credit market is reluctant to lend to farmers for non-farm activities. Second, SFHs' access to output markets related to self-employment activities is constrained.

Since the late 1990s, in situations where formal credit is withheld from apparently unattractive market segments like small-scale entrepreneurs in the farm or non-farm sector, **microcredit** has been proposed as a panacea. Whether the existing microcredit suppliers in the case-study countries can actually fill the credit gap in the short run is more than doubtful. Empirical evidence regarding the effect of microcredit access on beneficiaries' income situation is mixed. However, it is safe to say that microcredit can boost economic activity if the institutional environment and the overall market conditions are favourable.

There are high expectations for the **transitional semi-subsistence measure**. In Bulgaria and Romania this measure includes the obligation to increase the economic farm size by three European Size Units (ESU), within three years in Romania and five years in Bulgaria. In Poland, farmers only have to provide a simple business plan and prove that they implemented actions from the business plan to be considered under the transitional semi-subsistence measure. However, the marginal productivity gained from investing the semi-subsistence support in the farm can, by its very nature, only be low. The simulations show that a small return from the transitional semi-subsistence support does not significantly change the cash balances of most households.

Farm development and embarking on a **non-farm self-employment activity** seem to be the most promising future strategies for SFHs. If the policy goal is to restructure the agricultural semi-subsistence sector, it requires a broader-based

effort. Our findings suggest that the transitional semi-subsistence measure on its own is insufficient. Given the importance of non-farm employment for many of the people concerned (particularly rural diversifiers and rural newcomers), the development of the rural economy at large is important. Similarly, the adequacy and relevance of **national pension and social security systems** may also be worth a review, as many owners of SFHs are already in their sixties or close to this age. Access to agricultural support programmes is available to SFHs but not as easily as for larger farmers, which should be recognised in all aspects of the administration of these programmes. Hence, establishing social safety nets and facilitating exit options from farming are crucial. Moreover, establishing good general economic conditions, providing hard infrastructure, information services, encouraging farmers to follow demand, and improving marketing systems are further approaches to foster farm development and growth.

As soon as SFHs start to grow and their farm output increases, the question arises how they **can market their surplus**. This study shows that rural diversifiers and rural pensioners are not reliable suppliers for traders and processors, and are unlikely to get involved in any modern market system. This is not necessarily a problem for them because they produce primarily for their own consumption and thus market access is not a high priority. Things are different for farmers and the rural newcomers and they may have to confront market realities decided by global agri-food chains. Recent research projects agree unanimously that agri-food chains prefer contracting with large-scale agricultural producers. Only when there are no large-scale producers in the market do they start to support small-scale farmers in adapting to their quality and quantity requirements. It may be concluded that SFHs in Poland, Romania, and Bulgaria are in general too small to participate in support programmes from the agri-food industry. Specifically, there may be a chance for very few farms that focus on highly specialised and very labour intensive products such as soft fruits or herbs.

SFHs especially may profit from **producer organisations** and **co-operations**. Our results show that although membership in formal organisations in general, and producer and market organisations in particular, is not widespread, there are nevertheless household members who join or would be willing to do so. It may be assumed that primarily the households that seek farm development become organised. Membership in organisations is at the least time-consuming, and a measureable advantage from a membership may be difficult to obtain when the marketed quantities and thus the profit are low. From the side of the organisations, the natural question is why they should deal with many of the smallest suppliers, which increases transaction costs but does not add noticeably to the market power of the organisation.

It seems most likely that the net social payoff from efforts to add to the **human capital** of the people concerned is likely to have the greatest long-term net social payoff. Farm households with greater levels of skills are likely to farm better and be better able to develop their farms and other businesses. Educated family members are more likely to be able to compete in the job market. Improving the employability of household members should be a key objective of social policy and labour market policy. Information gathered during surveys shows that the people concerned have few resources, which is the main reason for their low and uncertain cash positions. From a national point of view, adding to the capital assets they control by means of education is likely to be not only the most feasible option available but also the most profitable one in the medium-term.

■ 1 Introduction

In the most recent enlargements of the European Union (EU), a large number of micro-farm households - so called semi-subsistence farm households (SFHs) - came within the remit of the Common Agricultural Policy (CAP). The policy question was, and still is, how these households can be stimulated either to become market-oriented commercial farms or to exit from the agricultural sector. Both these developments would count as positive structural change.

It is difficult to answer this question because reliable statistical information on SFHs is scarce. Moreover, SFHs may follow diverse objectives simultaneously in order to sustain their livelihoods. Their portfolio of objectives largely depends on their specific characteristics. This emphasises that it is a challenging task to address the households with the right policy measures for promoting structural change and maintaining sustainable rural livelihoods.

In this context, two issues are of special interest: (i) what characterises SFHs in Central and South-eastern Europe? and (ii) what development strategies could benefit them most? This study aims to answer both questions.

Chapter 1 is structured as follows: Section 1.1 provides an overview of the SFH phenomenon. Section 1.2 briefly outlines how responsive SFHs are expected to be to policy measures. Section 1.3 presents the objectives addressed and identifies research questions. The structure of the study on “Sustainability of Semi-Subsistence Farming Systems in New Member States and Acceding Countries (S-FARM)” is outlined in Section 1.4.

1.1 The Challenges for Semi-subsistence Farm Households

Subsistence farms are defined as those that produce for the needs of their own household only. In developed countries, most small farms sell at least a small part of their production, and are in fact semi-subsistence farms⁴. Therefore, the term semi-subsistence farm is used in this study, although the literature reviewed often refers to such farms as subsistence farms.

In academic and policy discussions, semi-subsistence farming is often associated with inefficient production and low levels of technology. It may be surprising that semi-subsistence farming in Central and Eastern Europe (CEE) was not a short-term phenomenon in the transition from a centrally-planned towards a market economy. In fact, its importance has grown during transition. It seems that semi-subsistence farms of less than five hectares have become a persistent and economically non-negligible phenomenon in CEE. They make up the majority (82% out of a total of 9.2 million) of farms in the New Member States (NMS) of the European Union (EU) and, according to Pouliquen (2001) referring to the late 1990s, contribute at least 50% to total agricultural production. Nevertheless, the majority of semi-subsistence farms in the NMS cannot provide sufficient income to secure an adequate livelihood for the household (EC 2004).

A specific feature of agriculture in the NMS is the duality of farm structures. On the one hand, a few very large farm enterprises owned by commercial companies or co-operatives

⁴ A semi-subsistence farm should be distinguished from a hobby farm, which is a smallholding not intended as a primary source of livelihood, often maintained for recreational use or as a lifestyle choice and funded by other income.

exist, while on the other hand, there are many small-scale farms, often semi-subsistence and part-time, the majority of which are smaller than five hectares. The existence of these small-scale subsistence-based farms is to a certain extent a legacy of the socialist era when agricultural workers employed by the state and collective farms were allowed to manage small plots for their family consumption. At the end of the socialist era, small-scale semi-subsistence farms provided 20-40% of the agricultural production in CEE (Pouliquen 2001). At the beginning of the 1990s, the number of semi-subsistence farms increased due to the collapse of the non-farm sector in rural areas. In some countries like Romania, the loss of employment opportunities in urban areas together with land privatisation led to migration into rural areas to secure a minimum livelihood from agriculture (Buchenrieder and Knüpfer 2001, Köster 1997, Petrick and Weingarten 2004a). Semi-subsistence farming in such settings has played an important role as a socio-economic buffer (Buchenrieder and Knüpfer 2001, Kostov and Lingard 2002a, Petrick and Weingarten 2004b). However, this dual farm structure is frequently perceived as inefficient and socio-economically non-sustainable (cf. Sarris et al. 1999, EC 2004).⁵

Given the historical knowledge regarding farm restructuring in the old EU Member States, only a fraction of the semi-subsistence farms in the NMS can be expected to grow to commercially viable and socio-economically sustainable sizes (EC 2004). Therefore, one of the key questions within the EU rural development policy debate is how

semi-subsistence farms can be dealt with most effectively. Currently, among other more general measures aiming at human capital creation and promotion of a diversified rural economy, the EU offers specific support for small-scale farms in the NMS, the so-called transitional semi-subsistence measure. The measure is part of the second pillar of the Common Agricultural Policy (CAP) and is financed out of the European Agricultural Fund for Rural Development (EAFRD)⁶ for the period 2007-2013.

Semi-subsistence farming also plays an important role as a social buffer. At present, despite the fact that semi-subsistence farm households (SFHs) represent the majority of farm households in the NMS, not much is known about their motivation, objectives and behaviour (Kostov and Lingard 2004a). With respect to motivation, Kostov and Lingard (2002a) distinguish between “consumption orientation”, where households produce primarily for their own needs and only sell occasional surpluses, and “production orientation”, where households sell as much of their production as possible and just keep the balance for own consumption. They suggest that the smallest semi-subsistence farms are more consumption oriented, while larger ones seem to be more market oriented.

1.2 The Issue of Policy Response and Semi-subsistence Farm Households

The high level of heterogeneity of SFHs makes policy decisions difficult, particularly because research results indicate that semi-subsistence farmers are not very responsive to market and policy signals that would normally lead to farm exit or expansion (Mathijs and Noev

⁵ Socio-economic sustainability is defined in this study as an income that allows coverage of all production costs as well as living expenses. More generally, a livelihood is sustainable when it can cope with and recover from stresses and shocks, and maintain or enhance its capabilities and assets, both now and in the future, while not undermining the natural resource base (Carney et al. 1999). In this study the authors follow the narrow definition and focus on the socio-economic sustainability of SFHs. The indicator used is viability, calculated as household gross income including unearned income, net of agricultural production costs, self-employed activities, and dependent employment minus living expenditures.

⁶ See European Council Regulation No. 1698/2005. The transitional semi-subsistence measure allows the NMS to grant a subsidy of max 1,500 EUR for a period of up to three years, given that the SFH provides an eligible business plan. After a positive assessment of the progress of the investment, the period for the transitional semi-subsistence measure can be extended by two years.

Table 1: Diversification among small-scale farms

	Share of small-scale farms with non-farm income (%)	Share of non-farm income in total income (%)
Albania	31-38 ¹⁾ 55-70 ¹³⁾	31-33 ¹³⁾
Armenia	...	31 ¹²⁾
Bulgaria	35-42 ¹⁾	40-42 ²⁾ 61-67 ³⁾
Czech Republic	...	15 ⁴⁾
Georgia	...	65 ¹²⁾
Hungary	53-56 ¹⁾ 91 ⁵⁾	17 ⁴⁾
Macedonia	74 ⁶⁾	50 ⁶⁾
Poland	56 ¹¹⁾	(60) ⁴⁾ 63 ⁷⁾
Romania	41 ⁸⁾ 29-30 ¹⁾	(60) ⁴⁾ 74 ⁹⁾
Slovakia	...	20 ⁴⁾
Slovenia	69 ⁶⁾	45 ⁴⁾ 43 ⁶⁾
USA	...	77 ¹⁰⁾

Note: The figures come mostly from smaller sectoral surveys, not national representative surveys. Figures in parentheses are rough estimates by Greif (1997). ³⁾, ⁶⁾, ¹⁰⁾ and ¹³⁾ exclude non-earned income.

Source: ¹⁾ Mathijs and Noev (2002), ²⁾ Kopeva et al. (2001a), ³⁾ Traikova (2005), ⁴⁾ Greif (1997), ⁵⁾ Rizov (2005), ⁶⁾ Möllers (2006), ⁷⁾ Csaki and Lerman (2002), ⁸⁾ Buchenrieder et al. (2000), ⁹⁾ Sarris et al. (1999), ¹⁰⁾ Fernandez-Cornejo (2007), ¹¹⁾ Chaplin et al. (2006), ¹²⁾ Bezemer et al. (2005), ¹³⁾ Meyer (2008).

2002, Kostov and Lingard 2004a). Historical evidence suggests that, when it comes to land and animals, SFHs try to maintain the status quo. On the other hand, they strive to increase income per household member by diversifying their income sources through non-farm sector activities. There is growing evidence that in CEE, rural households commonly depend on non-farm sources for 30-60% of their income (Davis and Gaburici 1999, Greif 1997). Table 1 depicts the degree of diversification of SFHs in a number of transition countries.

Having said this, it is clear that on-farm decisions, from choice of technology to choice of specialisation, are influenced not only by on-farm but also off-farm commitments and opportunities as well as unearned income flows (such as social transfer payments and subsidies). This has further policy implications. For instance, support provided by agricultural and rural development policies may affect different types

of SFHs differently, depending on the relative importance of on-farm income from subsistence and commercialisation versus non-farm income from non-farm activities and unearned income.

Responses to policy initiatives will also depend on the resource position of SFHs. Typically, such farm households have relatively few resources in the form of land and physical assets, although they are rarely heavily indebted. Furthermore, they have low levels of education and conservative attitudes towards risk and entrepreneurship. Their main strength is the availability of cheap labour, although even this resource declines with age and many such farmers are now quite old. Overcoming these constraints is the focus of adjustment and sustainability processes. Such development is also conditioned by external events such as the change in real prices of agricultural produce, the demand for product quality standards on retail markets, the rising cost of energy and labour (especially for

services), globalisation and liberalisation of agricultural markets, and rising income levels in other sectors of society.

1.3 Objectives and Research Questions of the S-FARM Study

This study provides an in-depth analysis of the policy challenges posed by the phenomenon of semi-subsistence agriculture and its complex and interactive determinants. It assesses the impact of current and potential rural development measures on SFHs in three selected case-study countries: Poland, Bulgaria, and Romania. A particular focus is on the socio-economic dimension, including the aims and objectives of semi-subsistence farm households.

The four objectives within the scope of this study are:

- to analyse the current state of socio-economic sustainability of SFHs,
- to identify and classify various different types of SFHs,
- to identify factors that may influence the behaviour of farmers and therefore their future socio-economic sustainability, and
- to assess the impact of 2005 EC Rural Development Measures on SFHs' socio-economic sustainability.

The following research questions were addressed in the study:

1. *What characterises SFHs in Poland, Romania, and Bulgaria?*

What are the main types of SFHs, when categorised according to household and farm characteristics? How do household behaviour, institutional environment characteristics and SFH viability differ between the main types of SFHs?

2. *How viable are SFHs given their current productivity and socio-economic environment?* Particularly of interest are the extent to which social and policy transfers play a role in the maintaining viability, and in the effect of income diversification on SFH viability.
3. *Can SFHs benefit from the transitional semi-subsistence measure?* The degree of SFHs' awareness of this measure, whether they have already participated or whether they intend to apply for it in future is investigated.
4. *How viable will the various types of SFHs be in the future?*

1.4 Structure of the S-FARM Study and the Report

The report is divided into four parts. Part 1 consists of two chapters. Chapter 2 outlines the conceptual framework and reviews the literature on SFHs. Special emphasis is given to assessing various commonly used definitions of semi-subsistence farming. Drawing on information provided by the local experts, Chapter 3 summarises facts and figures regarding SFHs in Poland, Romania, and Bulgaria.

Part 2 presents the survey instrument on which the analysis is based. Chapter 4 covers the design and implementation of the survey, and outlines the procedure for selecting the survey regions, villages, and households in the case countries.

A crucial step in the S-FARM study was defining types of SFHs across the case countries. This is described in detail in the two chapters (5 and 6) that comprise Part 3. Chapter 5 describes four types of SFHs, whereas their behavioural characteristics and relative viability is analysed for each case country in Chapter 6.

Part 4 deals with the simulation model and the results obtained. Chapter 7 describes the model and its underlying assumptions and constraints, while Chapter 8 reports simulation results for representative SFHs of each case country and SFH type. Chapter 9 concludes the report.

The annexes contain the statistical procedures and complementary tables together with the two questionnaires and the detailed simulation results.

Part 1: Semi-subsistence Farm Households: Literature Review and Application to Transition Countries

■ 2. Semi-subsistence Farm Households: A Literature Review

Many authors, including Tschajanow (1987), Hazell et al. (2007), Ozanne (1999), and Schultz (1964), have contributed to the discussion on peasant farm household behaviour. With the beginning of the transition from socialist to market economies 20 years ago in Central and Eastern Europe, a new strand of literature emerged. Research has centred on the phenomenon of agricultural transition in general (Lerman 2000, Macours and Swinnen 2000, Mathijs and Swinnen 1998, and Rozelle and Swinnen 2004) and on the emergence of a surprisingly persistent semi-subsistence farm sector in particular (Brüntrup and Heidhues 2002, Kostov and Lingard 2004b, Lerman 2004, Mathijs and Noev 2004, and Sarris et al. 1999). Single production factors have been studied, for example labour adjustments in agriculture (e.g. Swinnen et al., 2005), credit markets (e.g. Swinnen and Gow 1999), and land reforms (e.g. Giovarelli and Bledsoe 2001). In addition, a lot of empirical work has been done in single transition countries. In particular, the authors mention Chaplin et al. (2007), Crescenzi (2004), and Csaki and Lerman (2002) for Poland, Gavrilesco and Gavrilesco (2007), Giurca (2008), Petrovici and Gorton (2005), and Rizov et al. (2001) who studied SFHs in Romania, and Kostov and Lingard (2002b), Lulcheva and Todorova (2005), Mishev et al. (1997), and Mishev and Kostov (2000) who investigated the Bulgarian semi-subsistence sector. Although this project focuses on Poland, Romania, and Bulgaria, the authors would also like to signal the work of Caskie (2000), Seeth et al. (1998), and Wehrheim and Wobst (2005) for Russia.

This chapter summarises the main findings of this literature. Various definitions of subsistence and semi-subsistence farming are explored in Section 2.1. The controversies surrounding theories designed to explain the behaviour of semi-subsistence farm households are discussed in Section 2.2. The chapter ends by summarising, in Section 2.3, the determinants and characteristics of these households, and the prospects for the agricultural semi-subsistence sector in CEE.

2.1 Identification and Definition of SFHs

One of the common threads in the discussions on SFHs is the problem of identifying them and providing a strict definition. They have to be clearly distinguished from both subsistence farms and from commercial ones. This is not an easy task as SFHs form a very heterogeneous group consequently definitions of SFHs are quite vague and in many cases rather descriptive. It is difficult to set a clear-cut boundary between subsistence farms on the one hand and commercial ones on the other. While it might be possible to agree on clear statistical indicators for separating these two categories, they would usually be almost impossible to verify since most of these households do not keep any records. Hence, their production figures, consumption shares and sales have to be estimated by household members themselves or by third parties. Therefore, it is quite challenging to obtain exact figures on the number and importance of SFHs.

Within the field of agricultural economics, there is generally a distinction made between farms that mainly produce for the markets and those that primarily satisfy the subsistence needs of the farm household. The threshold for this distribution is rather arbitrary. Doppler (1992) suggests labelling all farms that sell up to 10% of their production as subsistence farms, those selling 10-90% as “transitory” (or semi-subsistence) farms, and those selling more than 90% of their production as commercial farms. Very often studies just use a 50%-threshold (Heidhues and Brüntrup 2003), classifying all farms selling less than 50% as subsistence farms while all those selling more than 50% as commercial. It is impossible, however, to properly identify semi-subsistence farms in this simplified bimodal classification.

Petrick and Tyran (2003) adopt a pragmatic approach in their analysis of subsistence-oriented as opposed to commercial-oriented farms in Southeast Poland. The average farm in their sample sells about three-quarters of its output to the market, so the farms might be termed semi-subsistence. They measure the degree of subsistence as the proportion of own-consumed food in relation to the value of total production. For further analysis, they focus on the comparison of two subgroups of their sample. They divide it into two equally-sized groups according to their degree of subsistence being above or below the median value (i.e. 17.3%) for the sample.

One might also look at the dependence on production for own consumption in order to decide whether a farm is a subsistence or semi-subsistence farm household. Nevertheless, it is quite difficult to identify homogeneous groups by this approach. Heidhues and Brüntrup (2003) provide examples of households that can cover 50% of their consumption needs by their own production, but where the corresponding share of farm production might be very different. Half the household’s consumption needs correspond to a very small share of Household A’s output, more than half of Household B’s output, and exactly

half of Household C’s output. Hence, within this same category there appear to be different groups representing different factor endowments and objectives.

An alternative approach is based on agricultural area, which is relatively easy to measure. Farm size as measured by area emerges clearly and consistently in all CEE countries as the major determinant of the decision to engage in the sale of farm products. Marketing farms are larger. Therefore, to have marketable surplus output, farms must be larger than some minimum size (Lerman 2004). McConnell and Dillon (1997) suggest that a farmed area of 0.5-2.0 ha might be a good proxy indicator for semi-subsistence farms. However, they agree that a uniform farm size threshold cannot be adopted, as it depends on local natural, social and economic conditions. Whereas in fertile, well-irrigated areas one-hectare farms might be managed on a commercial basis, in other regions 20-30 ha might ensure the bare survival of the farm household.

Braun and Lohlein (2003) suggest that (semi-)subsistence farms should not only be distinguished by their share of consumption. They propose taking into account the input perspective as well. Unlike commercial farms, (semi-)subsistence farms do not buy many inputs from outside. Typically, they rely on household labour, manure from their own animals, and simple tools. However, Braun and Lohlein do not provide any guidelines for translating this idea into empirical analysis.

Besides determining the share of own consumption from total agricultural output, it is necessary to assess whether agricultural income (both in cash and in kind) is the dominant source of income for the farm household. To date, nothing has been said about the contribution of non-farm sources to total farm household income. In addition, location and product mix might induce SFHs to react differently to the same policy measures. Responses to policy initiatives will also depend on the resource position of SFHs.

Due to their importance and the political will that SFHs should be encouraged to expand and improve agricultural productivity, the EU and national governments have had to define SFHs more precisely. According to the EU, semi-subsistence farms are “agricultural holdings, which produce primarily for their own consumption and also market a portion of their output” (EC Regulation 1698/2005, Article 34(1)). However, the threshold share of sales of agricultural output that would differentiate within this group between subsistence and commercial farms is not defined. In addition, one may assume that “agricultural holdings” refers to registered agricultural farms only. However, in many CEE countries, the registration process is still relatively vague, which is reflected by the national statistics of the three case countries in the S-FARM study (see Chapter 3). Depending on the definition adopted for a farm, the total number of farms as well as the number of SFHs fluctuates significantly. Hence, the borderline between an agricultural holding and a hobby farm is not always clear.

Based on the EU definition, the countries under review adopt their own rather pragmatic definitions of a SFH at national level. While in Poland the agricultural production value has to be within the range of 2 to 4 ESU⁷ (MARD 2007a), it is wider in Bulgaria where all farms producing between 1 to 4 ESU (RDP 2007) are classified as SFHs. The broadest limits have been set in Romania, where the farm’s production value has to be between 2 and 8 ESU (NRDP 2008). These differences might be justified by differences in the current socio-economic situation in rural areas. However, the Farm Accounting Data Network (FADN) methodology classifies Polish farms of more than 2 ESU as commercial farms whereas the threshold is only 1 ESU for Romanian and Bulgarian farms (FADN 2008).

To enable stricter comparisons, a uniform standard was adopted in this analysis for all

countries under review, whereby SFHs are defined as agricultural holdings of 1 to 4 ESU that market a part of their agricultural production.

2.2 Theoretical Attempts at Explaining SFHs’ Behaviour

The key question in the theoretical and empirical literature on subsistence farming is whether subsistence farm households react perversely to price incentives and which theory can explain their observed behaviour. Ozanne (1999) overviews several historical approaches and distinguishes four main streams. The colonial point of view considers that the neoclassical theory of the firm is inappropriate within the special context of subsistence production, and proposes instead the **target income** or **fixity-of-wants hypothesis**. This hypothesis explains decreasing sales at times of increasing prices by pointing out that people’s basic needs are satisfied with fewer sales when prices are higher, thus allowing people to spend more time on leisure. However, later empirical studies showed that peasant farmers react “normally” to price incentives. Another strand of criticism of neoclassical theory focussed on its assumption that production and consumption are “separable” that is, production is driven by profit maximisation, whereas consumption is driven by utility maximisation given the fixed (maximised) production (and other) income. This was considered invalid for peasant households, and consequently models that centred on own-consumption and **marketed surplus** were developed. However, follow-up studies aiming at “direct econometric estimation of the relationship between marketed surplus from peasant farmers and price have been problematic and inconclusive” (Ozanne 1999, p. 257). **Safety first** principles and the **theory of expected utility maximisation** were used in the following to deal with peasant farmers risk averse behaviour and decision making under uncertainty. But no study found “any evidence to support the hypothesis ... that risk aversion and uncertainty may be strong enough to generate perversity in supply response” (Ozanne 1999, p. 261).

⁷ 1 ESU=1,200 EUR standard gross margin.

Progress was not made until **agricultural household models** started to consider peasant farmers as both producers and consumers, thus reverting to Chayanov's theory of peasant economic behaviour (Tschajanow 1987). Contrary to neoclassical theories of producer and consumer behaviour, the new household models assumed that labour use and intensity of agricultural production depend on the worker/consumer ratio of the household and that perverse or normal response to price incentives is a result of household composition. Chayanov's assumption that no labour market exists was relaxed and a number of alternative agricultural household models with specific assumptions were developed. Results from these models showed that output and marketed supply responses of peasant farmers to price incentives are normal. Ozanne (1999) concludes that: "Farmers in less developed countries, though perhaps operating by a different economic calculus from that of neoclassical theory, are nevertheless rational economic agents." (p. 264). In the meantime, agricultural household models with various constraints and assumptions can be considered the state-of-the-art in research into the behaviour of semi-subsistence farm households.

More recently, de Janvry et al. (1991) and Kostov and Lingard (2004a) contributed to the theoretical discussion surrounding subsistence agriculture. De Janvry et al. (1991) discuss subsistence in the context of market failures and the relation of shadow prices to sales and purchase prices.⁸ They develop a household model that decomposes household behaviour into production and consumption decisions, and that considers market failures for food and labour. They show that the often observed inelastic or even perverse supply responses by peasant households to price incentives are the results of missing markets and not of peasants' inflexible

behaviour. Kostov and Lingard (2004a) develop a two-stage decision model taking transaction costs and risk aversion into account. In the first stage, a household decides whether to buy food or embark on agricultural production. In the second stage, a decision is made whether agricultural production is sold or used for household consumption. Like de Janvry et al. (1991), they discuss the effect of the shadow price in relation to sales and purchase prices. Their main argument is that in low income/transition countries, subsistence production causes positive spill-overs for the whole economy but that an uncertain environment holds subsistence farm households in a poverty trap. They also stress that more needs to be known about what motivates SFHs to take up agriculture and what guides the orientation⁹ of their production.

Summarising, it can be said that empirical data indicate a perverse supply response of small-scale farm households to price incentives when neo-classical theory is applied. Agricultural economists have been offering interpretations of this phenomenon for many decades. Their first argument was that peasant farmers are simply irrational decision makers. Although this idea can still be found in the literature, more sophisticated attempts consider not only the production but also the consumption side of a farm household, and relax neo-classical theory by introducing additional elements into their models. Most recently, risk aversion, market failure and transaction costs have gained prominence. However, all these explanations address the economic side of the phenomenon only despite the fact that there are good reasons to assume that small-scale farm households are also driven by non-economic aspects. Kostov and Lingard (2004a) stress the importance of the non-economic goals and preferences of these households. In so

8 When purchase price > shadow price > sales price, households will be subsistent. When the shadow price drops below the sales price, households will be sellers. When the shadow price increases above purchase price, households will be buyers (de Janvry et al. 1991, p. 1402).

9 The authors distinguish between two types of households. The first wants to secure consumption and will market surplus only, while the second produces primarily for sale and consumes only the residual. While the second type is prepared to react to changed market conditions, the first type does not respond to price incentives.

doing, they step into the broad subject area of socio-psychological motivation that has been somewhat neglected in economics.

This study combines the economic perspective with the non-economic one. It is assumed that SFHs act rationally in their given constraints but additionally, socio-psychological aspects are considered. A simulation model is developed and applied in order to simulate future developments. The model takes the household perspective, and explicitly considers SFHs' objectives and aims.

2.3 Determinants, Characteristics and Prospects of Semi-subsistence in CEE

Contrary to developing countries where SFHs could be observed over more generations, this type of farm is a relatively new phenomenon in CEE. Although in many transition countries home gardens were popular (Chaplin et al. 2007, Kostov and Lingard 2002b), the number of subsistence and semi-subsistence farms increased rapidly after the change of the political and economic regimes in CEE. This has been attributed to the sharp decline in income that accompanied this change (Brüntrup and Heidhues 2002, Mishev and Kostov 2000). With macroeconomic reform and rapid integration into the globalising economy, many industries were revealed as uncompetitive on an international scale, which led to economic decline, high inflation, collapsed social security systems, severe rural and urban unemployment, poverty, and finally great uncertainty about future development. Rising food prices and the risk of food insecurity made subsistence farming a rational option for maintaining households' basic food supply (Caskie 2000, Seeth et al. 1998). The impact of these factors was enhanced by the land reform measures adopted, i.e mainly restitution to pre-communist owners or their heirs, or distribution among members of old collective farms, which caused fragmented land ownership and resulted in the creation of many small farms (Giurca 2008, Lerman 2004, Mathijs

and Noev 2004). Additionally, imperfect and poorly functioning factor and product markets and limited access to those markets made it difficult for these small farms to prosper and to sell surplus (Kostov and Lingard 2002b, Mishev and Kostov 2000).

Although SFHs seem at first sight to be an impediment to economic growth, they provide rural people with income and food and are often the only way to survive under extremely difficult conditions (Brüntrup and Heidhues 2002). Rural farming households are better off than rural non-farming ones and subsistence production becomes the more important the poorer a household is (Csaki and Lerman 2002, Petrovici and Gorton 2005). Additionally, SFHs make a significant contribution to domestic agricultural production although only smaller shares of this production are actually sold (Caskie 2000, Sarris et al. 1999, Seeth et al. 1998). Kostov and Lingard (2002b) stress the stabilising role that the agricultural subsistence sector has for fragile economies by restricting output supply. Even if SFHs exhibit lower technical efficiency, the combined effects of their presence, when compared to a totally commercial agriculture, are positive both in terms of production and consumption. Their low level of technology actually facilitated the absorption of urban and rural excess labour. In a situation of surplus labour, when there is no alternative employment for that labour, extra investment to increase productivity exacerbates the situation. Moreover, it would increase output supply, further depressing prices and thus further reducing farm incomes. When price levels are already close to the break-even point, extra investment may lead to bankruptcies.

SFHs operate only small farms and are typically headed by older people (Chaplin et al. 2007, Gavrilescu and Gavrilescu 2007, Mathijs and Noev 2004, Sarris et al. 1999). Contrary to the situation in developing countries, in CEE semi-subsistence farmers are not illiterate peasants and many of them were previously employed in the former corporate farm (Lerman 2004).

Nevertheless, although they are experienced in specialised agricultural activities they often lack the ability to manage an integrated farm (Rizov et al. 2001, Sarris et al. 1999). Access to formal credit is limited (Sarris et al. 1999, Swinnen and Gow 1999), thus borrowing is only short-term from friends or relatives or farmers wait until they are able to finance the investment from their own savings (Lerman 2004). With no access to credit and plenty of labour available at low cost, investment in new technologies rarely takes place and capital is substituted by labour (Kostov and Lingard 2002b). Thus, the semi-subsistence production system is characterised as labour-intensive, under-capitalised, lacking modern technology, and maintaining a low degree of specialisation (Brüntrup and Heidhues 2002, Caskie 2000, Seeth et al. 1998).

A key issue in the literature is the question whether SFHs are willing to develop their farm. Kostov and Lingard (2004a) see an “inability and unwillingness to ‘unlearn’ already learned patterns of behaviour” (p. 578), Brüntrup and Heidhues (2002) speak from a “lack of entrepreneurship” (p. 2), and Mishev and Kostov (2000) describe them as having “much more conservative behaviour than commercial farming” (p. 73). Although there are examples of even small-scale farms that start to grow, nevertheless household characteristics and the initial farm size seem to play a key role (Crescenzi 2004, Csaki and Lerman 2002). In this study, it is argued that the objectives and aims of households also determine whether a household will invest in its farm. Kostov and Lingard (2002b) express it succinctly as follows: “Subsistence farmers maximise utility functions that reflect both monetary and non-monetary factors and are subject to economic and social constraints” (p. 84).

One determinant of the future development of small-scale farmers that has recently gained much prominence in the scientific literature is the impact of foreign direct investment (FDI) on the agri-food chain. Dries and Swinnen (2004) give a comprehensive overview of the observed

contradictory effects of FDI on domestic firms and conclude that a positive effect of FDI on domestic producers can only be expected when the technological gap between the domestic and foreign firms is not too large. There are several reasons for expecting that small-scale agricultural producers will not succeed in an environment where large-scale global players in the agri-food chain dictate the rules of the game. On the one hand, global players prefer a few large-scale suppliers, which minimises their transaction costs. On the other hand, high quality and safety standards increase the pressure on small-scale producers (Dries et al. 2007, Csáki and Forgacs 2007). Nevertheless, there are examples in the literature showing that small-scale agricultural producers can compete on the globalised market and that FDI in the agri-food chain may have positive effects on small-scale producers by solving contract enforcement and hold-up problems and providing access to financial capital (Dries and Swinnen 2004, Gow and Swinnen 1998). Whether small-scale agricultural producers actually survive and compete successfully on the globalised food market depends heavily on the existing structure of agricultural production in their country. In countries where large-scale suppliers are not available, processors invest in assistance programmes to upgrade small-scale producers (Dries and Swinnen 2004, Dries et al. 2007, Reardon and Swinnen 2004). Although this will be an opportunity for many small-scale producers to prosper, Dries and Swinnen (2004) show that it will be rather the younger and more educated farmers that will benefit from assistance programmes.

Producer and marketing organisations offer small-scale producers an opportunity to overcome their unfavourable position relative to large-scale processors and traders (Dries et al. 2007, Mathijs and Noev 2004). However, bad experiences with cooperative ventures during the socialist era have made farmers reluctant to participate (Csáki and Forgacs 2007, Lerman 2004, Swinnen and Maertens 2007). Although the idea of co-operation may not be popular among SFHs, empirical evidences show that new forms

of co-operation are emerging (Lerman 2004), and Swinnen and Gow (1999) see successful approaches in Romania and Bulgaria for financial credits. Additionally, SFHs have many links to large-scale corporate farms. Corporate farms offer machinery services, employment, credit, and an opportunity to market a surplus (Sarris et al. 1999). Caskie (2000) gives the even more extreme example of Russia, where “many farm worker regard materials purchased by the former state or collective farm as little different from their own property” (p. 206). Since co-operation seems to be crucial for SFHs (Lerman 2004, Mishev and Kostov 2000), their actual co-operations and willingness to cooperate is researched in detail in this study.

While functioning agricultural factor and output markets will foster agricultural development, various examples of successful agricultural commercialisation show that semi-subsistence farm households have been driven by forces external to agriculture (Pingali 1997). The shift from subsistence to commercial farming is more likely when the driving forces are income and job opportunities outside the agricultural sector (Kostov and Lingard 2004a, Mishev et al. 2002, Rizov 2005). Having said this, literature provides little evidence that the agricultural subsistence sector will diminish in the near future. Farm development will be an option for younger farmers operating larger farms (Rizov and Mathijs 2003, Sarris et al. 1999). While for the majority of households facing high unemployment and limited access to land and capital the farm will remain a safety net (Gavrilescu and Gavrilescu 2007, Kostov and Lingard 2002b, Mathijs and Noev 2002).

It stands to reason that governments would like to reduce the number of SFHs and to provide their resources to an efficient commercial agri-food sector. Nevertheless, authors advise governments against measures designed to discourage SFHs and recommend addressing

the underlying reasons for semi-subsistence production (Brüntrup and Heidhues 2002, Kostov and Lingard 2004b). Non-farm income opportunities, a secure food supply, and a reliable social security system would ease households’ need for producing for own consumption, thus changing households’ objectives and aims. Functioning factor markets, access to product markets, and provision of agricultural extension service are undisputed preconditions for commercialisation of SFHs that would like to stay in the sector. Care should be taken with policy measures that cement the current production and farm structure (Gavrilescu and Gavrilescu 2007, Crescenzi 2004). Following this, different approaches for different household types are necessary (Petrovici and Gorton 2005, Crescenzi 2004).

Summarising, it could be said that SFHs typically have low endowments of land, capital, and human capital, but dispose of plenty of labour. Households largely insist on their traditional way of life and seek to maintain their current livelihood. In addition, there is a good chance that developments in the agri-food chain will further marginalise them. Under these conditions, farm development and structural change in rural areas seem to be impossible.

This study aims at providing a more diverse impression. It will show that semi-subsistence is a multi-faceted phenomenon and that SFHs are not by definition poor and unwilling to develop. It will look for different types of households for which various development strategies will be tested. It is argued that households’ aims and objectives are key drivers for embarking on a specific strategy. A number of measures to promote farm development have recently been proposed or become available, but at this stage, it remains an open question what their effect is likely to be when non-commercial agricultural producers are targeted. This project aims at providing evidence on this issue.

■ 3. Country Case Studies on Semi-subsistence Farm Households

Chapter 3 is devoted to summarising facts and figures on SFHs in the three case countries Poland (Section 3.1), Romania (Section 3.2), and Bulgaria (Section 3.3). The description of the farming sector is complemented with a review of existing policy measures for small-scale farming.

3.1 Farm Structure and Semi-subsistence Farm Households in Poland

3.1.1 Farm Structure

Due to the unique structure of Polish farm holdings, agriculture was not greatly affected by transition compared to other sectors, and has acted as a buffer for many unemployed people. Unlike other ex-communist countries, farms in Poland were not collectivised during the 1950s. The regime managed to enforce collectivisation in the Western parts of the country only, where most farms had been newly settled after World War II. Other regions show a pattern of high land fragmentation. These are small privately owned farms.

The number of farms larger than 1 ha fell from 2.1 million to 1.7 million in Poland between 1990 and 2005. This was accompanied by a rising share of the smallest and largest farms, and a declining share of medium-sized farms.¹⁰ Over 99% of farms are family farms. The share of utilised agricultural area (UAA) managed by family farms in 1995 was 84.7% and had risen to 88% by 2005, whereas corporate farms (less than 1% of total farms) own 12% of the UAA. In 2005 the average size of utilised agricultural area among farms larger than 1 ha was 8.7 ha (Central Statistical Office 2006).

¹⁰ Farms with 1-2 ha were 17.7% of the total in 1990, and 25% in 2005. The share of farms larger than 15 ha rose from 6.1% to 11.1% over the same period.

3.1.2 Semi-subsistence Farm Households

In Poland, the semi-subsistence sector is not well researched. There are very few publications concerning this sector. The authors of the Poland country study relied on existing national statistics and a farm survey executed by the Institute of Agricultural Economics (panel study of almost 4,000 farms carried out in 1992, 1996, 2000 and 2005, the sample is representative for Polish farms larger than 1 ha), but did not carry out field research of their own. Additionally, no public debate has emerged on this issue, so there is no media coverage on the topic. Nevertheless, some authors discuss this issue, at least in passing.

In order to make viable statements about the role and situation of semi-subsistence farms, it is first necessary to clarify what is understood by a SFH in the Polish context. This seems to be a highly problematic issue. To date, the Polish agro-economic literature uses various ways of classifying farms and there is no uniform definition. Hence, a number of different definitions have been used. Similarly, statistics collected by different institutions vary significantly.

Some authors use the terms of self-subsistence farms (*gospodarstwo samozaopatrzeniowe*) (Michna 2005), social farms (*gospodarstwo socjalne*) (Michna 2005, Sikorska 2006), low sales farms (*gospodarstwo niskotowarowe*), and partly-commercial farms (*gospodarstwo półtowarowe*) interchangeably¹¹. In the official statistical data available from the Central Statistical Office in

¹¹ For example, Michna (2005, p.9) wrote that one group consists of “social farms that are self-subsisting with agricultural products, families that make their living mostly from non-farm sources of income, including non-salary sources of income”. Similarly, in the papers edited by Wilkin (2005), the terms “social farms” and “self-subsistence farms” are used interchangeably.

Poland, other terms also appear: farms producing for their own needs (gospodarstwo produkujące na własne potrzeby) and farms producing exclusively for their own needs (gospodarstwo produkujące wyłącznie na własne potrzeby).

To add to the confusion, one of the measures in the Polish Rural Development Programme (RDP) for 2004-2006 offered payments to “semi-subsistence” farms (niskotowarowe – low sales level) which according to the RDP were defined as farms from 2 to 4 ESU in size (MARD 2007b). However, it is very likely that a significant percentage of those farms that were granted financial support in order to increase the share of agricultural income from total income, were generating income mainly from non-farm activities, thus not meeting the criterion of dependence on agricultural production.

Rowinski (2003) suggests defining the term “semi-subsistence farm” as a farm that sells more than 50% of its production, but also uses a significant share of its production for household consumption. In the majority of available publications, the authors use all those terms rather intuitively, without providing an explicit definition. This is partly because the studies are not focusing on these farms, and only mention them when analysing other problems or farm groups. Moreover, all those publications are based on authors’ estimates and provisional statistics only, because so far no detailed research has been done on this topic.

When it comes to assessing the prevalence and the characteristics of subsistence and semi-subsistence farm households, there are two specific surveys available. In the first, by the Office for the Committee for European Integration (UKIE 2003), which refers to data of the National Census of 2002, three different types of farms are distinguished:

- Social farms (producing exclusively or mostly for their own needs),

- Semi-subsistence farms, and
- Viable farms¹².

Social farms are the most common and at the same time the poorest group. Depending on the source and methodology, they comprise between 55% and 65% of total number of farms in Poland (2002). The value of their annual sales is less than 5,000 PLN¹³, their agricultural area is usually smaller than 2 ha, and the share of own-consumption in farm output is higher than 50%. Agricultural income represents only a small share of total household income.

Semi-subsistence farms have annual sales between 5,000 PLN and 15,000 PLN. Their size is usually between 2 and 15 ha. The share of own-consumption in farm output is between 10 and 30%. Non-agricultural income is less than 50% of total household income.

Józwiak (2006) refers to two different data sources to describe the structure of Polish farms. On the one hand, he exploits National Census Data from 2002. On the other hand, he analyses FADN data from 2004. Polish farms are classified according to their economic size in ESU (Table 2). Farms smaller than 2 ESU are considered to be “social” or “subsistence” farms, whilst farms with 2 to 4 ESU are considered “semi-subsistence”. These farms are eligible for subsidies under the Rural Development Plan, as discussed in the following section. According to this differentiation, semi-subsistence farms make up about 13% of all farms, cultivate about 13% of the arable land and provide employment for about 19% of the total agricultural labour force.

Józwiak (2006) provides detailed information on the human capital of farm household heads

¹² This is the official term used by UKIE (2003) for market-oriented farms, although some agricultural economists would argue that these farms are not necessarily more profitable than the other farms.

¹³ 1 EUR = 3.35587 PLN average exchange rate for 2002 (<http://www.oanda.com/>).

Table 2: Poland: Number of farms, employment rate, total area, and structure of land owned by different types of farms according to farm size, 2002

	Total in Poland	Farm size (ESU)		
		<2	2-4	>4
Farms with agricultural production (thousand)	2,172.2	1,429.8	284.9	457.5
Percentage	100.0	65.8	13.1	21.1
Fully employed people (thousand)	2,253.6	877.4	425.6	950.6
Percentage	100.0	38.9	18.9	42.2
Arable land area (thousand ha)	15,160.2	3,178.4	1,964.3	10,017.5
Percentage	100.0	21.0	12.9	66.1
Forest and forest grounds area (thousand ha)	1,014.3	367.0	181.9	465.4
Percentage	100.0	36.2	17.9	45.9
Other land (incl. ecological land) (thousand ha)	857.1	318.8	114.3	424.0
Percentage	100.0	37.2	13.3	49.6

Note: Data are based on the 2002 National Census.

Source: Józwiak (2006).

Table 3: Poland: Characteristics of farm household heads by farm type and size, 2002

	Average	Farm size (ESU)		
		<2	2-4	>4
Household heads with agricultural degree (%)	42.4	30.4	54.9	72.1
Household heads with agricultural background = 100, among these:				
University degree	2.8	2.6	2.0	3.3
Secondary education	13.0	11.1	10.9	16.2
Course completed	84.2	86.3	87.1	80.5
Percentage of farms managed for a period:				
Up to 5 years	22.0	25.3	17.3	14.5
Between 6 and 20 years	45.6	41.5	50.9	55.2
More than 21 years	32.4	33.2	31.8	30.3

Note: Data are based on the 2002 National Census.

Source: Józwiak (2006).

(Table 3) and their economic results (Table 4). With respect to educational levels, there is a clear trend for the share of household heads with an agricultural degree to increase with farm size. While just over 30% of the subsistence farm heads have such a degree, it is true for about 55% of the semi-subsistence farms and for more than 70% of the market-oriented farms. Among the latter, more than 80% have completed at least one farming course. Trends are less marked regarding work experience. About one third of all farmers have been managing their farms for more than 20 years, and less than a half between 6 and 20 years (Table 3).

Average agricultural income per farm is very low, beginning with slightly above 1,200 PLN for subsistence farms, about 6,600 PLN for semi-subsistence farms and about 38,000 PLN for market-oriented ones. While the share of non-farm sources compared to total farm household income declines with increasing market-orientation, it can nevertheless be deduced that these sources of income do not neutralise the large farm income discrepancies. Income per working hour increases steeply with market-orientation, indicating rising farm productivity. Direct payments form an important part of net farm income. In 2004,

Table 4: Poland: Economic results achieved by farm type and size, 2004

	Average for farms	Farm size (ESU)		
		<2	2-4	>4
Average agricultural income (PLN)	9,649.0	1,224.0	6,623.0	37,799.0
Per 1 ha of agricultural land (PLN/ha)	1,231.0	613.0	832.0	1,726.0
Per working hour (PLN/h) ¹⁾	4.5	0.94	1.98	5.84
Share of direct payments in net farm income (%)	55.3	70.6	32.8	22.0
Percentage of farms with financial loss (%) ²⁾	35.2	44.0	28.1	12.0
Percentage of income from other sources (%)	72.9	90.5	65.5	22.7

Notes: FADN (2004).

¹⁾ For farms larger than 2 ESU, the income per working hour was calculated based on FADN data as follows: average agricultural income per working hour = average agricultural income per labour input. For farms smaller than 2 ESU, average income per hour was estimated on the basis of FADN data and economic accounts for agriculture. ²⁾ Farms with net agricultural income below zero.

Source: Józwiak (2006).

Table 5: Poland: Regional shares of farms without market production, 1996 and 2000

	Year	Total	Macroregions				
			Mid-west	Mid-east	South-east	South-west	North
Share of farms without market production (%)	1996	5.4	2.7	3.6	8.4	5.5	4.4
	2000	10.6	2.5	7.2	17.7	7.8	14.2
Average area of farms without market production (ha)	1996	3.8	2.0	2.8	2.0	3.4	16.3
	2000	2.7	2.1	3.1	2.0	2.2	6.5

Source: Karwat-Woźniak (2001).

they amounted to 70% of net farm income for subsistence farm and about one third for semi-subsistence farms. In addition, the lower the share of agricultural sales to the market, the higher the share of farms reporting financial losses from agricultural production (Table 4).

While no precise data are available on the extent of subsistence and semi-subsistence farming over time, rough data reveal that the share of farms without market sales seems to have almost doubled during the late 1990s. In addition, there seems to be some regional differentiation: the number of farms producing exclusively for their own needs rose between 1996 and 2000, especially in the South-eastern, Northern and Mid-eastern parts of Poland. At the same time, the average area of these farms fell, and this change was the steepest in the Northern part of Poland (Table 5). The increase in subsistence

farms can be due to bad general economic conditions. Karwat-Woźniak (2001) suggest that some farmers may have stopped producing for the market in order to avoid costs, falling back on other sources of income, and that they may return to market production when the situation in the market becomes more favourable. Almost 50% of farm households that do not produce for the market earn income as hired labourers, and more than one third of them living on their pensions.

3.2 Farm Structure and Semi-subsistence Farm Households in Romania

3.2.1 Farm Structure

The number of farms in Romania is difficult to assess. The Country Report on Romania (EC 2002) puts their number at 3,946,630, of which

Table 6: Romania: Number, cultivated area and farm size by farm size groups, 2002

	Farm size group				Total
	1-5 ha	5-100 ha	100-1,000 ha	> 1,000 ha	
Number (thousands)	1,571.1	264.4	8.5	1.8	1,845.7
Share of total (%)	85.1	14.3	0.46	0.10	100
UAA (thousand ha)	3,693.7	2,411.6	2,866.4	3,679.8	12,651.4
Share of total (%)	29.20	19.6	22.66	29.09	100
Average farm size (ha)	2.35	9.12	336.86	2,096.75	6.85
Average number of plots	4	7	14	42	5
Average area of plots (ha)	0.59	1.26	23.70	50.32	1.51

Source: NIS (2003).

1.6 million or 40% exploit less than one hectare. The General Agricultural Census (Recensământul General Agricol, RGA) estimates their number at 4,462,221 of which 52% manage less than one hectare and another 42% manage 1-5 ha. These two groups seem to represent subsistence and semi-subsistence farms, respectively (RGA 2002). Yet another figure is given by the National Statistical Office, which puts their number at 1,845,738 for the year 2002. This latter survey includes farms larger than one hectare only. An overview of the farm structure by farm size groups is given in Table 6.

Even ignoring the number of farms smaller than one hectare, Romanian agriculture is characterised by a bimodal structure. There are many small-scale farms managing a few plots on the one hand, and a small number of large-scale farms cultivating a larger number of large plots on the other.

3.2.2 Semi-subsistence Farm Households

The agricultural transformation process in Romania led to a distribution of about 96% of farm land to private ownership, mostly allocated among small and very small farms. Knowledge on the current socio-economic situation of SFHs is rather sketchy. There is no definition of semi-subsistence farms apart from the one contained in the EU regulation (Council Regulation (EC) No. 1698/2005, Article 34 (1), which designates those agricultural holdings producing primarily for their

own consumption and also marketing a proportion of their output. If it is assumed that farms with less than one hectare can be treated as subsistence farms, it then follows that the majority of semi-subsistence farms will be found in the farm size group 1-5 ha. Table 6 shows that this group comprises about 1.6 million farms. However, there is no information about the exact share of semi-subsistence farms within this group.¹⁴

The National Development Plan for 2004-2006 mentions subsistence and semi-subsistence farming only in passing, and both types are included in the SWOT¹⁵ analysis where the opportunities and weaknesses of each sector are analysed. These two types of farming systems are seen as a major reason for Romania remaining a net importer of food. The underlying causes are considered to be extreme land fragmentation and the low efficiency of these small farms.

Up to now, there have been very few, and quite superficial, studies about the extent and role of semi-subsistence farming in Romania. The former Minister of Agriculture, Dinu Gavrilescu, referred to this topic in some of his communications, but did not provide any figures or analytical results.

¹⁴ This section reflects the substantiated state of knowledge up to spring 2007, which was the basis for the work for this study. In spring 2008, the EC approved the Romanian National Rural Development Programme 2007-2013 (NRDP 2008) that provides more detailed information. It defines semi-subsistence farms as holdings of size 2 to 8 ESU, which applies to approximately 350,000 holdings.

¹⁵ SWOT: Strengths, weaknesses, opportunities, and threats.

Table 7: Romania: Share of farm types and utilised agricultural area, 2002

Type of farm	Farms		Share of total UAA (%)	Average size (ha)
	Number (thousands)	Share of total (%)		
Subsistence	3,400.1	76.3	28.8	1.17
Semi-subsistence	947.5	21.2	22.4	3.3
Commercial individual farms	92.6	2.0	4.1	6.17
Commercial corporate farms	22.7	0.5	44.7	274

Source: MAFRD (2006).

In a more detailed study, Ramniceanu (2004a) concluded that the boundaries between subsistence, semi-subsistence and commercial farming are hard to draw in Romania. The main issue is to choose appropriate physical or economic criteria in order to define them. Ramniceanu adopts a rather simple criterion for the differentiation: farms of up to 3 ha are called subsistence farms, from 3 to 15 ha semi-subsistence farms, and those with more than 15 ha are commercial farms. According to this definition, about 67.4% of Romanian farms can be identified as subsistence farms, another 25.2% as semi-subsistence farms, while the remaining 7.4% are commercial farms.

In 2006, steps were taken to specify the number of subsistence and semi-subsistence farms in more detail. Analysis by the Ministry of Agriculture, Forestry, and Rural Development (MAFRD) under the National Strategic Plan (NSP), estimated the size and relevance of the various farm types. In that analysis, about 21% of all farms in Romania, or about 950,000 holdings, were classified as semi-subsistence farms (Table 7). These farms cultivate about 22.4% of the national agricultural area and their average farm size is around 3.3 ha. However, no information was provided on the criterion used to differentiate semi-subsistence farms from subsistence and commercial farms

Shortly after EU accession, the Ministry of Agriculture, Forestry, and Rural Development published in the National Programme on Rural Development (NPRD) (MAFRD 2007) a first classification of Romanian farms using the EU

economic farm size measure ESU. In spring 2008, the EC approved the final version of the Romanian National Rural Development Programme 2007-2013 (NRDP 2008). The NRDP defines SFHs as those agricultural holdings that produce primarily for own consumption, sell only part of their output and have an economic size of 2-8 ESU. According to Eurostat, slightly more than 3.9 million farms operated in Romania in 2007. Of this number, about 3 million (or 78%) have an annual turn-over of less than 1 ESU; these farms are usually called subsistence farms (Martins and Spendingwimmer 2009). Another 629,000 farms (or 16%) have a turn-over between 1 and 2 ESU. About 212,000 farms (or 5.4%) showed a turn-over between 2 and 8 ESU. Finally, about 23,500 farms (or about 0.6%) had an annual turnover of more than 8 ESU. They are considered to be producing mainly for the market.

3.3 Farm Structure and Semi-subsistence Farm Households in Bulgaria

3.3.1 Farm Structure

The transformation period in agriculture started with a radical land reform, liquidation of former agricultural producers' co-operatives, and dismantling of the command economy in the sector. The result was a fragmented agricultural production system in Bulgaria, dominated by small-scale farms. This small-scale farming was carried out alongside co-operatives operating large units, private farming companies cultivating rented land, and informal associations and partnerships. As a result, Bulgarian agriculture is

Table 8: Bulgaria: Size distribution of individual farms, 1993

Farm size groups (ha)	Number of farms (thousands)	Share of group in total (%)	Farmed land (thousand ha)	Average size (ha)	Share of farmed land in total (%)
Up to 0.2	915.2	51.5	83.1	0.09	3.1
0.21-0.5	363.6	20.5	118.4	0.33	4.4
0.51-1.0	256.4	14.4	180.5	0.70	6.7
1.10-2.0	156.5	8.8	214.6	1.37	8.0
2.10-5.0	68.5	3.9	205.1	3.00	7.7
5.10-10.0	13.4	0.8	90.3	6.72	3.4
Over 10.0	3.5	0.2	1,783.2	508.60	66.7
Total	1,777.1	100.0	2,675.3	1.51	100.0

Source: MAF (1998).

characterised by a dualistic structure comprising the market-oriented sector of large-scale commercial farms on the one hand and small-scale semi-subsistence farms on the other. The first evidence for this phenomenon comes from a survey carried out in 1993 (Table 8).

Farms with less than 1 ha were about 86% of the total number of farms in the country, but they accounted for less than 15% of the total farmed land. By contrast, only 0.2% of all farms had more than 10 ha but they managed more than two thirds of the total farmed land.

The next evidence on farm structure in Bulgaria comes from the 2003 Agricultural Census (AC), which shows that the total number of agricultural holdings was 665,548. A change in methodology between the two censuses makes it difficult to compare these data with the figures from 1993. According to the new methodology (Agrostatistics 2005a), the AC covers agricultural holdings only if they are an independent economic unit with independent management that meets at least one of the following criteria (Eurostat 2010):

- 0.5 ha of UAA or 0.3 ha of arable land;
- 0.1 ha of specialized crop, or 0.05 of greenhouse crops, or 0.2 ha of permanent grassland;

- 1 cow or buffalo, 2 other bovine animals, 1 female equidae, 2 working animals (equidae), 1 breeding sow, 5 pigs, 5 breeding sheep, 2 breeding goats, or 50 laying hens, or 100 poultry for fattening, or 10 beehives, or 10 breeding female rabbits, or 1 reproductive male animal;
- if their production exceeds certain physical thresholds.

The thresholds applied since the 2003 AC were significantly lower than the ones of the other Member States for covering at least 99% of the national agricultural production. With the 2003 AC methodology, the first group in Table 10, i.e. farms with up to 0.2 ha, were totally excluded. Therefore, if the 2003 methodology were applied to the 1993 data, the number of farms at that time would be much smaller than shown.

The declining trend in the number of agricultural holdings in Bulgaria can be clearly seen from the 2005 Farm Structure Survey (Agrostatistics 2005b) Between 2003 and 2005, the number of agricultural holdings decreased by another 130,000 (from 665,548 to 534,613), of which 57,000 withdrew from agriculture, 10,000 temporarily stopped farming and 64,000 reduced their size below the threshold for an agricultural holding. This process is accompanied by an increasing average farm size. When farms of less than 0.2 ha are excluded from the 1993

Table 9: Bulgaria: Size distribution of individual farms (natural persons), 2005

Farm size group (ha)	Number of farms (thousands)	Share of group in total (%)
Up to 0.29	319.2	31.2
0.30-0.49	164.5	16.1
0.50-0.99	235.6	23.1
1.00-1.99	165.3	16.2
2.00-4.99	90.1	8.8
5.00-9.99	23.4	2.3
Over 10.0	23.9	2.3
Total	1,022.0	100.0

Source: Agrostistics (2005c).

data, the average size of the remaining groups was 3.0 ha per farm. Average farm size in the 2003 census was 4.44 ha, and it had increased to 5.23 ha by the time of the 2005 survey. The Farm Structure Survey in 2005 also provided data on the size distribution of individual farms (Table 9).

A comparison of Table 8 and Table 9 shows that significant changes occurred over the period of 12 years. The number of farms of less than 0.3 ha, which can be regarded as subsistence farms, declined dramatically, both in absolute and percentage terms. The share of farms between about 0.3 ha and 4.9 ha, most of which can be assumed to be SFHs, increased substantially between 1993 to 2003, from around 48% to 64%, although their absolute number declined from about 850,000 to about 650,000. The most significant changes in the Bulgarian farm size distribution, however, occurred in relation to commercial farms, i.e. farms over 5.0 ha. Their relative share increased from 1% to 4.6%.

Notwithstanding the rapid process of concentration that is clear in the survey data, there is a strong dual structure characterising Bulgarian agricultural production. Mishev (2003) discussed the influence of this dual structure on the impact of agricultural policy measures. His main conclusion is that the dual structure modified substantially the results of agricultural policy in Bulgaria during the transition period,

when most measures of agricultural price and trade policies did not achieve the expected results. A very high percentage of agricultural output in Bulgaria at that time was produced by subsistence farmers, who did not react to these measures.

3.3.2 Semi-subsistence Farm Households

The rough data of the various farm surveys indicate that small-scale farming and semi-subsistence agriculture are a strong characteristic of Bulgarian agriculture. This is confirmed by information from the 2005 Farm Structure Survey regarding annual sales by farms. When all farm ownership types (i.e. both natural and legal persons) are included, the survey reveals a similar picture concerning SFHs in Bulgaria as the one given in Table 9. About 69% of farm households in Bulgaria consume more than half the farm's total output, and therefore can be regarded as SFHs (Table 10). Only about 4% of the farms are fully commercialised, i.e. they sell all their agricultural production.

The emergence of semi-subsistence farming in Bulgaria dates from the beginning transition period and it was the subject of research and public attention mainly during that period. The literature survey shows that most studies of SFHs have focused more on farm structures in general and only a few directly touched on specific issues concerning SFHs, including their

Table 10: Bulgaria: Distribution of farms by the share of own consumption, 2004/2005

	Total number	More than 50% of agricultural output consumed by farm household	Less than 50% of agricultural output consumed by farm household	Fully commercialised farms
Number	534,613	367,986	147,629	18,998
Percent	100.0	68.8	27.6	3.6

Source: Adapted from MAF (2006a).

characteristics. The generally accepted meaning of “semi-subsistence” in Bulgarian literature is that SFHs comprise those farms where the household consumes a higher percentage of the total agricultural production than that sold in the market (Mishev 2003).

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A different concept was adopted by the Agrostistics directorate of MAF in 2005, when trying to specify the impact of the measure “support of semi-subsistence farms”. It classified all farms between 1 and 4 ESU that sell agricultural products as SFHs. Farms below 1 ESU were considered to be entirely subsistence farms and farms over 4 ESU were classified as commercial. Based on this definition, about 65% of farms in Bulgaria can be classified as semi-subsistence farms. The completion of the land reform, which was the basis for the development of a small-scale private family farm sector, and the presence of inefficient agricultural markets, caused a substantial decrease in agricultural production, not only total production but also factor productivity (Mishev et al. 1996 and 1997, Mishev and Ivanova 2006).

Several studies focusing on general characteristics of SFHs (Sarris et al. 1999a, Mishev 2003, Aleksiev 2003, Eastwood et al. 2004) have dealt with the nature of semi-subsistence and its common factors. For Bulgaria, Aleksiev (2003) states that the typical semi-subsistence farms are small and medium-sized farms that try to combine two objectives, namely providing enough produce

for self-sufficiency and participating in the market.

Many farms in Bulgaria are hampered by low cash flows and limited earning potential, which restricts their level of own capital for investment in commercialisation. This is exacerbated by the lack of financial services in the rural sector. This situation is confirmed in a FAO report: “Most working capital needs are met from farmers’ own-sources as banks are reluctant to credit the sector; but the volume of bank credit is expanding (albeit from a low base) especially to agro-industrial firms” (Csaki et al. 2006, p. 30). In this situation, financial services are not available for farms that do not produce for the market such as “the vast bulk of so-called farmers, who have little or no market orientation, and who only sell the occasional, unplanned surplus” (FAO and EBRD 2004, p. 3). Many farms have relied on state grants or EU grants to finance their operational activities. For instance, the State Fund Agriculture (SFA) supports Bulgarian agricultural producers with various measures, some of which are largely appropriate for semi-subsistence farmers. These measures include capital subsidies, interest subsidies for establishing perennials and poultry units, investment subsidies for animal breeding, and credit subsidies for producers in less developed areas. In 2005, 58% of capital subsidies under financed projects were granted in North-West and South-West regions, which have a high share of SFHs.

Some studies (Yoveva and Mishev 2001, Sarris et al. 1999a, Kopeva and Mihailov 1999) explore the social role of SFHs in Bulgaria. A striking feature of the Bulgarian agricultural

sector is the social stratification. Bulgarian rural regions are in general dominated by lower income groups, particularly retired persons. This fact is stressed by Mishev (2003), who stated that the average pension is about 35 to 40 USD per month, so subsistence farming is important for surviving. In addition, the lower education level of farmers has been stressed (Yoveva and Mishev 2001). From the demographic point of view, the development of SFHs is influenced by age and the gender structure of households. Sarris et al. (1999a) report that in 1998 the average age of farm holders was 62 years. In particular, older people and women have limited alternative employment opportunities. This fact explains their over-representation as heads of SHF as they have fewer other options.

Some publications consider the ethnic aspect of SFHs. Turkish and Roma people make up quite a large percentage of the population in the rural regions and are among small-scale farmers. In addition, they are among the poorest groups in the Bulgarian population. Therefore, some scholars stress the role of semi-subsistence farms as a key factor for social stability in rural areas. For instance, Kopeva and Mihailov (1999, p. 8) wrote that “access to factors of production (land, buildings, capital) is a core issue in terms of regional stability and potential for ethnic conflict”. This statement implies that access to a minimum level of agricultural production factors, allowing for self-sufficient food production, has a positive effect on regional social stability, and that its absence, as is often observed with Turkish and Roma people in Bulgaria, creates potential for ethnic conflict.

Giovarelli and Bledsoe (2001), Dirimanova (2005), Foster et al. (2001), Davis and Pearce (2000), Kopeva et al. (2001a), and Kopeva et al. (2001b), among others, discuss the role of land reform and land markets for semi-subsistence farming. According to Giovarelli and Bledsoe (2001, p. 40), “agricultural land was divided into two categories for purposes of restitution. The first category, called real boundary land,

consisted of parcels, the boundaries of which were not destroyed, or could be recreated based on documentation. The second category of land, called land division land, consisted of parcels that the state amalgamated into large state and collective farms at the time of expropriation”. In both cases, land was divided into small parcels. Multiple aspects of land fragmentation, including small total farm area, number of plots and quality of farmland, are considered to be a problem for farmers’ choice of farming system and contractual choice (Dirimanova 2005). In addition, the new land owners often do not have sufficient agricultural background to manage their farms, and lack the knowledge and experience to produce and market their output. It follows that they tend to be unresponsive to policy incentives intended to improve performance.

Another factor explaining the high share of SFHs in Bulgaria is a specific legacy of the country’s socialist period. According to Bachev (2006b), over 2 million Bulgarians received individual stakes in the assets of liquidated former co-operatives, but very few of them are working in the co-operatives. Many of the co-operative members, especially older ones, are running small individual animal husbandry farms, and receive the fodder from the co-operative, which cultivates their land. This symbiotic relationship is contributes strongly to the persistence of SFHs.

In summary, the factors underlying widespread semi-subsistence farming in Bulgaria are as follows:

- An inefficient agricultural market and a steep drop in consumption are the main factors have weakened the effect of price signals on output.
- The banks are reluctant to credit the agricultural sector. Thus, farmers are short of working capital. In addition, they have no self-generated funds for investments.
- The Bulgarian agricultural sector suffers from social stratification. The rural population

Table 11: Bulgaria: Regional shares (%) of all farms, commercial farms and UAA, 2005

Planning regions	Total number of farm holdings	Commercial farms	UAA
North-West	10.5	7.8	8.9
North-Central	14.7	17.8	22.5
North-East	18.5	26.5	32.8
South-East	10.9	12.4	14.5
South-Central	29.4	26.4	16.3
South-West	16.0	9.1	5.1
Total	100.0	100.0	100.0

Source: Agrostistics (2006).

Table 12: Bulgaria: Regional shares of farms by own-consumption share, 2004/2005

Planning region	Total		More than 50% of agricultural output consumed by farm household		Less than 50% of agricultural output consumed by farm household		Fully commercialised farms	
	Number	%	Number	%	Number	%	Number	%
North-West	56.1	100	47,826	85	7,544	13	684	1
North-Central	78.5	100	64,318	82	12,700	16	1,464	2
North-East	99.1	100	63,595	64	31,937	32	3,530	4
South-East	58.1	100	44,020	76	11,303	19	2,759	5
South-Central	157.4	100	82,523	52	66,625	42	8,278	5
South-West	85.5	100	65,704	77	17,519	20	2,283	3
Total	534.6	100	367,986	69	147,629	28	18,998	4

Source: Agrostistics (2006).

is mostly composed of low-income, low-education social groups.

- The land restoration process and the way socialist co-operatives were wound up have led to a highly fragmented farm structure.

Data from the latest farm survey (Table 11) reveal strong regional differences in agricultural structures. The highest regional shares of the larger commercial holdings (corporate farms), usually registered as sole traders, co-operatives or companies, are found in North-Central, North-East, and South-East regions. These three regions also have a much higher share of the national utilised agricultural area than their share of farm holdings. These regions are traditionally specialised in grain, sunflowers and meat production. Table 13 indicates that SFHs in

Bulgaria seem to be dominant in the North-West, South-West, and South-Central regions. However, this is not fully supported by the findings of another farm survey executed during 2005, which directly counts the numbers of SFHs in different NUTS 2 regions in Bulgaria (Table 12) and whose findings at national level are given in Table 10.

Table 13 reveals some differences in the distribution of the oldest farmers relative to the distribution of farms over regions. It is worth noting a special feature of the South-Central region, which has many small farms run by old farmers but which are not SFHs because they are specialised in tobacco production.

Our conclusion is that SFHs are more typical for the North-West, South-West, and North-Central regions. In general, SFHs are characterised

Table 13: Bulgaria: Regional shares (%) of all farms, commercial farms and farmers older than 65 years, 2005

Planning regions	Total number of farm holdings	Commercial farms	Farmers older than 65 years
North-West	10.5	7.8	13.9
North-Central	14.7	17.8	16.7
North-East	18.5	26.5	15.1
South-East	10.9	12.4	8.9
South-Central	29.4	26.4	28.3
South-West	16.0	9.1	17.1
Bulgaria	100.0	100.0	100.0

Source: *Agrostatistics (2005c)*.

by their small economic size, and are run by older farmers. In the South-West region, SFHs tend to be dairy and small-ruminant farms, while in the North-West and Central regions, SFHs specialise mainly in grazing livestock, granivores, and other crops and livestock.

The 2007 FSS was the second sample survey after the last AC in 2003. This survey recorded 493, 100 agricultural holdings in Bulgaria, which represents an 8% decrease since 2005. Farms under 1 ESU suffered a significant reduction (-10%), while the number of farms with at least 1 ESU decreased by 0.2% (Eurostat 2010).

3.4 Selected Policy Measures for SFHs in Poland, Romania, and Bulgaria

Instead of implementing the Single Payment Scheme (SPS) in the same fashion as the older EU Member States, the New Member States opted for a simplified version of direct payments, the Single Area Payment Scheme (SAPS). In the three case study countries, all farms above 1 ha, including registered semi-subsistence farms, are eligible for direct payments under the SAPS of Pillar 1 of the Common Agricultural Policy (CAP) (see, Table 14).

The SAPS is applied for a maximum period of five years, after which the SPS has to be implemented. Under the SAPS, an annual lump-sum per hectare is paid to farmers independent of their individual land-use decisions. The country-

specific payment level is based on a “national ceiling” in EUR and the total eligible utilised area.

By way of summary, Table 15 presents the farm structure in the three case countries in physical and economic farm size.

It is clear from Table 15 that all three countries have a dualistic farm structure. That is, there is an overwhelming number of small farms, whether in terms of physical or economic farm size, and a relatively small number of large farms, which nevertheless farm a significant share of the land. This structure implies that the majority of the SFHs will reap only limited benefits from CAP Pillar 1 measures, notably the SAPS. They are likely to benefit more from the RD measures of CAP Pillar 2 (MAFRD 2009).

Apart from the SAPS, four Pillar 2 Rural Development (RD) measures were modelled in the S-FARM study. Those RD measures (see Chapters 7.5.1 and 8) are described in more detail here. Policies to aid small farms, or more specifically SFHs, can be divided into three groups according to their objective: (1) restructuring, (2) diversification and (3) exit (ENRD 2010). Policies with the objective of restructuring (i.e. transitional semi-subsistence measure and farm investment support) seek to aid farmers to reach a critical size and become economically viable. As for the early retirement measure (M113) in Bulgaria and Romania, as well as the diversification measure (M311) in Romania, which had not yet been

Table 14: Eligibility criteria of SFHs in Poland, Romania, and Bulgaria for the Single Area Payment Scheme (SAPS)

SAPS	Poland	Romania	Bulgaria
Legal basis	Council Regulation (EC) No 1782/2003; Commission Regulation (EC) No 796/2004; Commission Regulation (EC) No 795/2004; Commission Regulation (EC) No 118/2005.		
Type of support	Annual lump-sum per ha		
Main eligibility criteria for beneficiaries	<ul style="list-style-type: none"> – Registered farmers – Minimum farm size: 1 ha – Maintaining farm in good agricultural and environmental condition 		
	– Minimum plot size: 0.1 ha	<ul style="list-style-type: none"> – Minimum plot size: 0.3 ha – Mainly agricultural production 	– Minimum plot size: 0.1 ha

Source: MARDF (2009), MAF (2009), and MARD (2007d).

Table 15: Summary of farm structure in Poland, Romania, and Bulgaria, 2007

Physical farm size	Average in ha	% farms		
		< 5 ha	>= 5 ha - < 50 ha	>= 50 ha
Poland	6.5	68.5	30.5	1.0
Romania	3.5	89.8	30.5	1.0
Bulgaria	6.2	94.9	3.9	1.3
EU-12	6.0	81.6	17.4	1.0
EU-15	22.0	54.5	34.6	10.9

Economic farm size	Average in ESU	% farms		
		< 2 ESU	>= 2 - < 100 ESU	>= 100 ESU
Poland	3.6	67.9	31.9	0.2
Romania	1.0	94.0	6.0	0.0
Bulgaria	2.2	89.1	10.6	0.3
EU-12	2.4	83.7	16.1	0.2
EU-15	23.8	28.4	66.4	5.2

Source: EU (2009).

implemented by the time of the survey in 2007, it was assumed that these measures would exist in the target year of the model (2016). The selection of the measures is based on intensive discussions with national experts from the three survey countries, IPTS, and IAMO experts. The selected measures are:

- Transitional semi-subsistence support (TSS) (M141),
- Farm investment support for the modernisation of agricultural holdings (M121),
- Support for diversification into non-agricultural activities (M311), and the
- Early retirement support (M113).

The specification of these measures in the model was based on expert knowledge of the country experts.

3.4.1 Transitional Semi-subsistence Measure (TSS)

Measure 141 of CAP Pillar 2 refers to the so-called transitional semi-subsistence measure (TSS). It gives temporary income support to SFHs and aims at improving the conditions for restructuring such holdings into viable commercial farm businesses. The measure is being implemented differently in individual EU member states (see Table 16).

Table 16: Description of Measure 141 "Supporting semi-subsistence agricultural holdings" in Poland, Romania, and Bulgaria

TSS	Poland	Romania	Bulgaria
Legal basis	Council Regulation (EC) No 1698/2005; Commission Regulation (EC) No 1974/2006		
Type of support	Annual flat-rate premium		
Amount of support	1,250 EUR per year	1,500 EUR per year	1,500 EUR per year
Duration of support	Max 5 years		
Main eligibility criteria for beneficiaries	– Semi-subsistence farms smaller than 4 ESU	– Semi-subsistence farms between 2 to 8 ESU	– Semi-subsistence farms between 1 to 4 ESU
	The measure is generally granted for 3 years.		– The measure is generally granted for 5 years.
	– Support is prolonged for 2 years if farmer achieved aims stated in the business plan. The aim of this measure is to increase the farm size above 4 ESU, but there are no restrictions if this is not successful and no control for what purpose the money is used.	– Support is prolonged for 2 years if there is an increase of the quantity of the sold production by 20% and a minimum increase of the economic farm size by 3 ESU.	– Support is prolonged if the agricultural holding can prove that it has reached and/or exceeded an economic farm size of 4 ESU and has also increased the economic farm size by at least 3 ESU.
		– Farmer is younger than 62 years	– Farmer is younger than 60 years
	Provision of a business plan		

Note: TSS: Transitional semi-subsistence support (RD measure 141).

Source: MARDF (2009), MAF (2009), and MARD (2007b).

While the TSS measure is applicable for farms of 2 to 4 ESU in Poland, eligible farms in Romania must be between 2 and 8 ESU and, in Bulgaria, between 1 and 4 ESU. The TSS measure ought to support the growth of the farm's economic size. While in Poland farms are not required to grow economically in order to continue receiving the support, the farms operated by SFHs must grow by 3 ESU within three years in Romania, and within five years in Bulgaria.

Recipients of the payment in Poland receive an annual lump sum of 1,250 EUR for up to three years, and then for a further two years provided that during the first three years the business plan was fulfilled. Up to June 2007, more than 172,000 farmers applied for this measure, and 1,223 million PLN were spent (MARD 2007b). Romanian farmers eligible for the TSS measure have to be natural persons registered as farmers and no older than 62 years of age. They can receive a lump sum of 1,500 EUR per annum under this measure. Based on the total annual amount (595,096,737 EUR) available for this

measure in Romania, a maximum of 396,730 farms could be supported. In Bulgaria, the TSS measure is also important for semi-subsistence farms. As in Romania, they receive a lump sum of 1,500 EUR per year and farm for up to five years. Recipients are natural persons registered as farmers with farms of between 1 and 4 ESU, and no older than 60 years (men) and 55 (women). They have to provide a business plan. Furthermore, during the five years of payment, the farm must exceed an economic size of 4 ESU and must grow by at least 3 ESU. After the first three years of support, the farm must show an increase in size by 1.5 ESU (RDP 2007).

3.4.2. Farm Investment Support for the Modernisation of Agricultural Holdings

The aim of M121 (Modernisation of agricultural holdings) is to improve the performance and competitiveness of agricultural holdings by providing investment grants. The measure supports investments for the introduction of new processes and technologies, for improving

Table 17: Description of Measure 121 "Modernisation of agricultural holdings" in Poland, Romania, and Bulgaria

Investment support	Poland	Romania	Bulgaria
Legal basis	Council Regulation (EC) No 1698/2005; Commission Regulation (EC) No 1974/2006		
Type of support	Grant aid to eligible investments		
Amount of support	– 40% of the total eligible investments		
	– 50% of the total eligible investments for young farmers (younger than 40 years) and 60% for young farmers in e.g. less-favoured areas and /or in Natura 2000 sites		
	– 50% of the total eligible investments for agricultural producers in e.g. less-favoured areas and/or in Natura 2000 sites		
	– Max 76,000 EUR per beneficiary	– Max 800,000 EUR per beneficiary*	– Max 1.5 million EUR per beneficiary*
	– Minimum investment 5,000 EUR	– Maximum investment 2 million EUR*	
Main eligibility criteria for beneficiaries	Registered farmers, conditions like under SAPS		
	Provision of a business plan		
	– Minimum economic farm size 4 ESU (or indication how to achieve it)	– Minimum economic farm size 2 ESU	– Minimum economic farm size 1 ESU
	– Beneficiary is below retirement age and has adequate agricultural education or experience		
	– Minimum area of SAPS, except beneficiaries under semi-subsistence measure 141		

Note: * The maximum investment and amount of support increases for specific investments and types of beneficiaries.

Source: MARDF (2009), MAF (2009), MARD (2007d).

the quality of agricultural products, for increasing safety, hygiene and animal welfare standards and for improving the protection of the environment.

The amount of support within the farm investment measure is largely similar in the three case study countries (Table 17). They support 40% of the total eligible investment. The funding for the measure is divided between young farmers¹⁶ (younger than 40 years) in general and young farmers operating farms in less-favoured areas and/or Natura 2000 sites. Producers in less-favoured areas and/or Natura 2000 sites also

receive slightly more support, as their eligible investments are cofinanced at 50% of the cost.

Two eligibility criteria for potential beneficiaries are the same in the three countries, namely that they must be registered and provide a business plan. The minimum economic farm size, however, differs and reflects somewhat the differing definitions for semi-subsistence farms in the three countries. In Poland, the minimum economic farm size for this measure is set at 4 ESU, in Romania at 2 ESU and in Bulgaria at 1 ESU.

3.4.3 Support for Diversification into Non-agricultural Activities

Adjustment patterns observed in the EU-15 show that if small farms are to survive, they need to decrease their reliance on farming income

¹⁶ Eligible young farmers in Poland are defined as those between 18 and 40 years old, who have just become the head of a farm for the first time, and whose farm is either above the 4 ESU threshold or can be demonstrated as attaining that size within five years. In Poland, few semi-subsistence farms can fulfil this requirement.

Table 18: Description of Measure 311 "Diversification into non-agricultural activities" in Poland, Romania, and Bulgaria

Diversification support	Poland	Romania	Bulgaria
Legal basis	Council Regulation (EC) No 1698/2005; Commission Regulation (EC) No 1974/2006		
Type of support	Grant aid for eligible investments, including general costs related to the investment	Not implemented	Grant aid for eligible investments, including general costs related to the investment
	– up to 50% of the total eligible expenditure		– 70% of the total eligible expenditure
Amount of support	– Maximum grant aid per beneficiary 25,000 EUR		– Maximum total eligible expenditure per project 400,000 EUR; for investments in renewable energy production 1,000,000 EUR – Maximum grant aid per project 200,000 EUR, for road transport sector investments 100,000 EUR – Minimum total eligible expenditure per project 5,000 EUR
Main eligibility criteria for beneficiaries	– Natural person, household member of an agricultural holding, insured by social insurance for farmers – Two out of the following criteria must be met: economic size 2-4 ESU, agricultural area < 15 equivalent hectares per person, high level of unemployment in the region, low income from taxes of local government		– Agricultural producers located in rural municipalities

Source: MARDF (2009), MAF (2009), MARD (2007d).

and combine farming activity with diversification or off-farm activity (ENRD 2010). Agricultural policy can impact on the farmers' propensity to diversify. In line with this experience, the diversification measure (M311) provides grants for investing in the development of non-agricultural activities (Table 18). The aim is to encourage the diversification into non-agricultural activities and to promote the development of non-agricultural income sources and employment in rural areas. Eligible investments are for instance related rural tourism, social services like childcare, processing, trade, handicraft, and transport.

As Table 18 indicates, only Poland and Bulgaria (among the three case countries) have implemented the diversification measure and they apply quite different conditions.

3.4.4 Early Retirement Support

The main objective of the early retirement measure (M113) is to provide an income for elderly farmers and farm workers who stop

farming and to encourage their replacement by farmers who expect to improve the economic viability of the remaining agricultural holdings (Table 19).

Thus, two sometimes conflicting goals are followed: social objectives on the one hand and structural objectives on the other. In the last programme period 2000-2006, the early retirement measure was offered in seven EU-15 countries (Germany, Greece, Ireland, Spain, France, Italy, and Portugal). From 2004-2006, EU-10 could also offer this measure (e.g. Poland opted for it). During the period 2007-2013, the measure will be offered by 17 Member States. In Romania, for instance, the early retirement measure should be implemented in 2010, after finalising the national retirement legislation. European regulations give discretion to the Member States regarding the design of the scheme.

Table 19: Description of Measure 113 "Early retirement of farmers and farm workers" in Poland, Romania, and Bulgaria

Early retirement	Poland	Romania	Bulgaria
Legal basis	Council Regulation (EC) No 1698/2005; Commission Regulation (EC) No 1974/2006		
Type of support	Monthly early retirement payment	Not implemented yet	Not implemented yet
Amount of support	<ul style="list-style-type: none"> – Based on the minimum state pension: basic amount is 150% of the minimum state pension – Support is increased by 100% if the farmer has a spouse – Support is increased by 15% when the holding with an area of min. 10 ha is transferred to a person younger than 40 years – The total amount of the support must not exceed 265% of the minimum pension – Maximum support is 18,000 EUR. 		
Duration of support	Support is provided until the beneficiary reaches the retirement age (65 years)		
Main eligibility criteria for beneficiaries	<ul style="list-style-type: none"> – Natural person – Older than 55 years, has not yet reached the retirement age yet (65 years for men, 60 years for women), is not a pensioner – Has been running the self-employed agricultural activity for at least 10 years prior – Has been paying retirement insurance for at least 5 years – Has transferred his/her agricultural holding and ceased to run any market-oriented agricultural activity – The successor should be younger than 40 years and must have sufficient agricultural qualifications; in a case of transferring to another holding (for enlargement) the new owner should be younger than 50 years. 		

Source: MARDF (2009), MAF (2009), MARD (2007d).

Part 2: The Survey Instrument of S-FARM

■ 4. Methodology for Implementing the Survey Instrument

In each of the three case countries, two survey regions were pre-selected: (i) Świętokrzyski and Poznański in Poland, (ii) Timis and Dolj in Romania, and (iii) North-West and North-Centre in Bulgaria. Between July and September 2007, a minimum of 175 SFHs were interviewed face-to-face using a standardised in-depth questionnaire. In Poland, experts from local extension services and in Romania and Bulgaria Ph.D. students performed the interviews, which lasted in general between one and a half and two hours.

The following sections describe how the surveys were implemented and what quality control measures were applied. The structure of the questionnaire is outlined in Section 4.1 (see Annex 8 for the complete questionnaire). The selection procedures for the survey regions, villages, and households are described in Sections 4.2 to 4.4. Section 4.5 gives an overview of quality control measures mandated in the surveys.

4.1 Structure of the Questionnaire

The questionnaire was developed in spring 2007 and reflects the state of knowledge at that time. It collected data for creating a typology for SFHs, but did not include all questions necessary for establishing the base data set and parameters for the programming model. These data were collected in a second survey round (see Annex 6 for the second-round questionnaire), after representative households for each SFH type had been determined in collaboration with national experts and IPTS.

The questionnaire was structured into the following 12 sections:

1. Household demography.
2. Household's equipment and access to infrastructure.
3. Agriculture (production, use, marketing channels, assets, and costs).
4. Policy support.
5. Non-farm family business (self-employment).
6. Dependent employment (working for a salary or commission for somebody else).
7. Other cash inflows.
8. Household expenditures.
9. Expected farm, household and market developments.
10. Social capital.
11. Household's objectives.
12. Enumerator's assessments.

Section 1 collected information on gender, age, education, degree of kinship, and social status of all household members. Section 2 asked about the household's equipment, such as computers and Internet, as well as its access to infrastructural facilities and how long it takes to the next city. Section 3, the largest part of the questionnaire, asked for detailed information about all farm activities, agricultural assets and labour use, and the use of output and marketing channels. Section 4 contained questions about policy measures, such as how various measures were publicised, the application behaviour of farmers, and the amounts of money received, as well as how the application procedure is perceived, the reasons for an unsuccessful application, and how the money would be spent. For the transitional semi-subsistence measure, the reasons for not applying were probed in greater detail and the cost of preparing a business plan was asked. Section 5 grouped all questions about non-farm self-employment including constraints that prevent

the household from developing its business as expected. Section 6 collected data on the dependent work of all household members. Household members without dependent employment were asked whether they were looking for a job or intended to look for one, and what factors were hindering them in finding one. Section 7 covered other cash inflows such as formal and informal loans, remittances from other persons, pensions, social security benefits, and income from other sources. Section 8 collected detailed information about household expenditures, whereas Section 9 asked for expected future developments on the farm (including strategies and anticipated future activities of household members) and in the institutional framework (markets for outputs, inputs and factors). Section 10 covered formal and informal co-operation and memberships in formal organisations, and willingness to join a formal organisation. Section 11, on the households' objectives and aims, asked for information that could be used in the simulation exercise to determine the constraints and weights of objective functions. In Section 12, the enumerator had the opportunity to write a short subjective assessment of the household.

4.2 Selection of Survey Regions

Two regions at NUTS 3 level (in Bulgaria at NUTS 2 level) were identified in each country. The regions had to be different from each other in at least one of the following indicators:

- Opportunities for non-farm income diversification. Opportunities are likely to be greater in peri-urban regions than in primarily rural areas, where it is expected that there is more reliance on on-farm income.
- Marked dual farm structure causing competition between SFHs and commercial farms for resources and on product markets.
- Former industrialised area that lost its importance after transition versus regions without structural breaks after transition.
- Greater importance of agriculture or higher unemployment rate in one region compared to other potential survey regions.

It was required that the average per capita income within the regions should be comparable to each other and to the country's average income to ensure representativeness. Average regional income within the band 80-120% of the country's national average income was assumed to fit this condition and, in particular, high-income regions like the commuter belt of capitals or other prosperous centres, and extremely backward ones, had to be avoided. Regions in which droughts or epizootics caused severe distortions in agricultural production within recent years also had to be avoided, as their effects were judged to be temporary. The following sections present four potential survey regions within each country, from which two were selected for each country for the surveys.

4.2.1 Poland

Table 20 shows indicators for four potential survey regions in Poland. Regional income is comparable in Radomski and Świętokrzyski, Poznański is lower and Ciechanowsko-Płocki leads the group.

Natural production conditions are comparable in Ciechanowsko-Płocki, Świętokrzyski, and Poznański and worse in Radomski. The share of employment in agriculture in total employment is highest in Radomski and Świętokrzyski. These are also the two regions with an industrial background that was lost after transition. The high share of employment in agriculture does not result in a higher share for agriculture to regional gross domestic

Table 20: Potential survey regions in Poland at NUTS 3 level

	Ciechanowsko-Płocki	Radomski	Świętokrzyski	Poznański	Poland
Average regional income (EUR) ¹⁾	616.3	543.5	541.2	518.0	624.4
Share of available per capita income from hired work in 2005 (%) ²⁾	52.9*	52.9*	38.2	46.3	46.0
Share of available per capita income from a private farm in agriculture in 2005 (%) ²⁾	4.6*	4.6*	8.8	7.5	4.5
Unemployment rate (%) ³⁾	20.7	24.1	17.8	11.0	14.9
Share of agriculture in regional GDP in 2004 (%) ⁴⁾	11.0	11.7	7.7	11.1	5.0
Share of employment in agriculture in total employment (%) ⁵⁾	38.2	43.3	40.4	22.1	21.5
Former industrial area that lost its importance after transition	No	Yes	Yes	No	
Opportunity for income diversification ⁶⁾	Yes	Limited	Limited	Limited	
If yes, which type of non-farm income dominates?	Services				
Pronounced dual structure of agriculture (yes/no)	No	No	No	Yes	
Number of farms (thousands) ²⁾	347.47*	347.47*	162.46	185.68	2,933.23
Share of SFHs in number of farms ⁷⁾	18.5	38.0	33.8	8.7	17.9
Number of applications for financial support of farms of size 2-4 ESU	3,746	6,357	21,316	2,301	168,436
Natural production conditions					
• Soil quality ⁸⁾	Average 48.5	Bad 43.2	Average 51.1	Average 50.5	49.5
• Relief	Flat	Flat	Hilly	Flat	
• Exposed to droughts ⁹⁾	No (3.2)	No (3.3)	No (3.4)	No (3.0)	3.3
• Exposed to floods	No	No	No	No	

Notes: ¹⁾ Gross income (2005), ²⁾ NUTS 2 level, ³⁾ Registered unemployment (February 2007), ⁴⁾ Gross value added of farming, fishery and hunting (2004), ⁵⁾ Employed in farming, fishery and hunting (2005), ⁶⁾ Often people commute to off-farm jobs or even work abroad, ⁷⁾ Share of UAA belonging to farms between 5 and 10 ha in 2002, ⁸⁾ Indicator of agricultural usefulness of the soil: country average is 49.5, ⁹⁾ Indicator of water conditions: country average is 3.3.

* Data available only at NUTS 2 level.

Source: Witek (1993), Central Statistical Office (2006b, 2007), Agency for Restructuring and Modernisation of Agriculture (2007).

product (GDP) and in Świętokrzyski especially this discrepancy is pronounced. The former industrialised regions show also a higher share of SFHs in the total number of farms. Therefore, it can be concluded that, in these two regions, people who lost their dependent employment returned to agriculture for survival. The number of applications for semi-subsistence aid shows clear-cut differences between the four regions. Since the administration level for this indicator is not the same as for the number of farms, it is not possible to calculate the share of applicants in the number of eligible SFHs.

Świętokrzyski and Poznański were selected for the survey for the following reasons:

- Świętokrzyski was an industrial centre that lost importance in the transformation process. In this region, the function of semi-subsistence farming as a retreat opportunity for survival is assumed to be well established. The region has a long tradition in cultivating small plots of land. Here, the question can be studied whether semi-subsistence farming attained greater importance after the breakdown of the industrial sector.

- In Poznański, the opposite situation holds. This region has the lowest unemployment rate, the lowest share of employment in agriculture in total employment, and the lowest share of SFHs in the number of farms. It is assumed that the determinants of persistence of semi-subsistence farming can be studied in this region.
- Świętokrzyski is the region with the most applications for semi-subsistence aid among the four potential survey regions. By contrast, Poznański has the fewest applications. It is assumed that this could shed light on why some SFHs do not apply for these subsidies.

4.2.2 Romania

Table 21 shows indicators for four potential survey regions in Romania. Regarding regional income levels, the counties Timis and Dolj on the one hand and Mures and Satu Mare on the other hand are comparable. Dolj and Mures have higher unemployment than Timis and Satu Mare, due to the collapse of industry following transition. Agricultural production is of high importance in all four counties but formal employment in agriculture, excluding self-employed agricultural activities, is smaller in the former industrialised counties. All four counties provide opportunities for non-farm income diversification; hence,

Table 21: Potential survey regions in Romania at NUTS 3 level

	Timis	Dolj	Mures	Satu Mare	Romania
Average monthly income (EUR on January 2007) *	267.84	254.29	237.79	218.05	298.49
Share of total household income from hired work in 2006 (%) **, 1)	50.8	46.3	49.5	48.1	44.5
Share of total household income from agriculture in 2006 (%) **, 1)	3.2	4.6	5.4	3.7	3.5
Unemployment rate (% , January 2007) *	2.1	6.9	5.6	3.9	4.9
Share of agriculture in regional GDP (%) ***, 1)	13.52	14.37	11.44	13.61	8.03
Share of employment in agriculture in total employment (% , January 2007) *	3.10	2.59	2.64	3.71	1.66
Former industrial area that lost its importance after transition (yes/no)	No	Yes	Yes	No	Yes
Opportunity for income diversification (yes/no)	Yes	Yes	Yes	Yes	Yes
If yes, which type of non-farm income dominates?	Services, crafts	Services	Services, crafts, tourism	Services, crafts, tourism	Services, crafts, tourism
Pronounced dual structure of agriculture (yes/no)	Yes	Yes	No	No	Yes
Number of farms (thousands)****	97.30	158.46	116.08	81,34	4,484.89
Share of SFHs in number of farms (% if available otherwise high/average/low)	Low	Average	High	Average	High
Natural production conditions:					
• Soil quality (bad/average/good)	Good	Good	Average	Average	Average
• Relief (mountainous/hilly/flat)	Flat	Flat	Hilly	Flat	All
• Exposed to droughts (yes/no) ²⁾	Yes	Yes	No	No	Yes
• Exposed to floods (yes/no) ¹⁾	Yes	Yes	Yes	No	Yes

Notes: ¹⁾ Figures refer to NUTS 2 regions. ²⁾ Drought and flood exposure is generally high in Romania due to relief, climate, obsolete land improvement works and poor maintenance of irrigation plants and flood control facilities. The regional assessments in the table are therefore of marginal relevance.

Source: * INS (2007a), ** INS (2007b), *** INS (2003a), **** INS (2003b), exchange rates for calculations from NBR (2007), and assessments from project's national experts.

this is not a useful indicator for selecting survey regions in Romania. A pronounced dual structure in agriculture can be observed in Timis and Dolj. The share of SFHs is around the average in Dolj and Satu Mare, whereas it is lower in Timis and higher in Mures. Natural production conditions can be rated good in Timis and Dolj and average in Mures and Satu Mare.

Timis and Dolj counties were proposed for the survey for the following reasons:

- Both counties are comparable in terms of income, opportunities for non-farm income diversification and natural production conditions.
- Dolj is a former industrialised area that lost its importance following transition. The higher unemployment rate matches the higher share of SFHs in the number of farms compared to Timis and suggests that people started agriculture after transition. Therefore, it is assumed that in this county the factors that pushed people into semi-subsistence farming can be studied very well.

4.2.3 Bulgaria

Survey regions were selected in Bulgaria according to statistical information at NUTS 2 level because the NUTS 3 level regions are quite small. Furthermore, there are 28 NUTS 3 regions in Bulgaria and a selection between so many regions seemed to be very complicated. Table 22 presents indicators for four NUTS 2 level regions. Two regions are excluded: (i) South-West, since the capital Sofia is located there and this makes the region not very representative, and (ii) North-East, which is characterised by very large farms and a specialised production structure focussing mainly on cereals and sunflower seeds.

Table 22 shows that semi-subsistence farming is a widespread phenomenon in Bulgaria. In all four NUTS 2 regions, a small

number of commercial farms operate alongside a huge number of subsistence and semi-subsistence farm households. In addition, incomes do not differ widely between the regions. Income figures for the North-West are surprisingly high. This is because the methodology used for national statistics in Bulgaria imputes relatively high values to income in kind. As this source of income is very high in the North-West, the income comparison can be considered to be misleading.

All four regions were former industrialised areas that lost their importance after transition but also offer opportunities for income diversification through non-farm activities. Hence, these two indicators are not good selection criteria. Compared to the other three potential survey regions, the North-West is characterised by a much higher unemployment rate, a higher share of agriculture in regional GDP, the lowest share of semi-subsistence (1 to 4 ESU) but the highest share of subsistence farms (<1 ESU). Natural production conditions for agriculture are better in the North-West and the North-Centre than in the South-East and the South-Centre. For Bulgaria, the additional selection indicator “availability of non-cultivated land” was proposed by the project’s national experts. Non-cultivated land is widespread in Bulgaria because of land reform and the restitution of plots to previous owners in their former boundaries, increasing land fragmentation. Owners are often absent so this land remains non-cultivated, and is a potential source for those SFHs that intend to grow. The easiest way for them to buy or rent additional land is to approach the owners of non-cultivated land and not to compete with large-scale corporate farms on the land market. But it has to be admitted that the percentage of non-cultivated land is higher in unfavourable regions and for land with poorer quality. The “availability of non-cultivated land” is high in the North-West and the North-Centre and average in the other two regions.

Table 22: Potential survey regions in Bulgaria at NUTS 2 level ¹⁾

	North-West	North-Centre	South-East	South-Centre	Bulgaria
Average household income (EUR)	3,584	3,266	3,379	3,390	3,363
Share of total household income from wages and salaries in 2006 (%) [*]	36.2	43.3	47.5	42.9	46.0
Share of total household income from households plots in 2006 (%) [*]	18.3	10.7	9.5	12.6	10.1
Average income by person (EUR)	1,420	1,327	1,359	1,277	1,319
Unemployment rate (%)	20.3	13.5	12.9	12.7	12.2
Share of agriculture in regional GDP (%)	19.3	13.7	17.2	15.0	10.8
Share of employment in agriculture in total employment (%) ²⁾	3	5	5	3	3
Former industrial area that lost its importance after transition (yes/no)	Yes	Yes	Yes	Yes	Yes
Opportunity for income diversification (yes/no)	Yes	Yes	Yes	Yes	Yes
If yes, which type of non-farm income dominates?	Rural tourism	Rural tourism	Rural tourism in some municipalities	Rural tourism in some municipalities	Rural tourism
Pronounced dual structure of agriculture (yes/no)	Yes	Yes	Yes	Yes	Yes
Number of farms	66.61	100.83	73,93	191.65	665.43
Share of SFHs in number of farms (%)					
< 1 ESU	82.6	78.5	75.1	74.0	76.4
≥ 1 ESU	15.6	19.0	21.5	23.4	21.0
≤ 4ESU					
> 4ESU	1.8	2.5	3.5	2.6	2.7
Natural production conditions:					
• Soil quality (bad/average/good)	Good	Good	Average	Average	
• Relief (mountainous/hilly/flat)	Hilly, mountainous	Hilly, mountainous	Hilly, mountainous	Hilly, mountainous	
• Exposed to droughts (yes/no)	Yes	Yes	Yes	Yes	
• Exposed to floods (yes/no)	Yes	Yes	Yes	Yes	
Availability of non-cultivated land (high/average/low)	High	High	Average	Average	

Notes: ¹⁾ The statistical data relates to planning years 2003 and 2004.

²⁾ Employees under contract considered only.

Source: Own calculations with data from MAF (2005) and * NSI (2007).

The North-West and the North-Centre were selected as survey regions for the following reasons:

- The North-West differs from the other three regions in that it has a higher unemployment rate, a higher share of agriculture in regional GDP, and a more pronounced share of very small-scale subsistence farms.
- The North-Centre is comparable to the North-West in terms of income diversification as both regions do not have nearby important summer or winter tourism centres.
- The North-West and the North-Centre have good natural production conditions for agriculture and a high availability of non-cultivated agricultural land. Both points are preconditions for the development of competitive commercial farm structures.

4.3 Selection of Villages

At least ten villages were selected within each NUTS 3 (NUTS 2 in Bulgaria) region. Due to varying data availability in the three

countries, slightly different selection procedures were applied. Care was taken to ensure that the variation in the selection procedure did not inhibit statistical cross-country analyses.

4.3.1 Poland

In Poland, reliable socio-economic data is available at NUTS 5 level. Therefore the following procedure could be used:

- In each NUTS 3 region, two NUTS 4 regions were selected randomly (Table 23).
- In each NUTS 4 region two NUTS 5 regions were supposed to be selected. However, because in the Poznański region a small number of semi-subsistence farms are spread evenly over the region, large farms dominate the farm structure. Therefore, the number of NUTS 5 regions was increased to four in Jarociński and five in Grodzinski in order to ensure that the farms selected for interview meet the criteria of being semi-subsistent.
- From each NUTS 5 region, two to three villages were supposed to be selected.

Table 23: Poland: Selected villages

NUTS 3 regions	NUTS 4 regions	NUTS 5 regions	Villages (number of interviewed households)
Świętokrzyski	Konecki	Końskie	Bedlno (1), Brody Nowe (1), Jeżów (2), Nowy Dziebałtów (4), Pomorzany (3), Stary Kazanów (4), Stary Sokołów (2), Sworzyce (2), Trzemoszna (4)
		Słupia (Konecka)	Czerwona Wola (2), Mnin (2), Olszówka (1), Pijanów (1), Pilczyca (4), Ruda Pilczycka (6), Słupia-Podwole (2), Wólka (2), Wólka-Konradów (2)
	Kielecki	Bieliny	Bieliny (4), Huta Nowa (4), Kakonin (2), Lechów (13)
		Łągów	Lechówek (2), Małacentów (3), Piotrów (1), Płucki (11), Zamkowa Wola (2), Złota Woda (3)
Poznański	Grodziski	Granowo	Granowo (5)
		Grodzisk Wielkopolski	Grodzisk Wielkopolski (10)
		Kamieniec	Kamieniec (2), Konojad (1), Wolkowo (3)
		Rakoniewice	Goła (2), Jabłonna (3), Komorówka (1), Rakoniewice (4)
		Wielichowo	Gradowice (1), Reńsko (2), Sniaty (2), Welichowo (8)
	Jarociński	Jaraczewo	Jaraczewo (15)
		Jarocin	Annapol (1), Cielcza (1), Jarocin (10), Mieszków (1), Witaszyce (1)
		Kotlin	Kotlin (6), Magnuszewice (1)
		Żerków	Żerków (6)

Source: Own table.

However, due to problems with finding enough farms of appropriate size in ESU, enumerators were allowed to interview farmers from more than two villages in each NUTS 5 region. Apparently, in Poznański there were still problems in identifying a sufficient number of SFHs fulfilling the size requirements, because in this region the share of semi-subsistence farms is relatively low compared to the national average. Table 23 summarises the villages where the interviews were carried out.

4.3.2 Romania

In Romania, socio-economic data at NUTS 4 level was missing and NUTS 5 data are poor and inappropriate for the selection process. Therefore, the following procedure was applied:

- A list of all villages within each NUTS 3 region was compiled.
- Villages with extreme income situations or production conditions were excluded.

Table 24: Romania: Selected villages

NUTS 3 regions	Villages (number of interviewed households)	
Timis	Near rural towns	More distant
	Jebel (7), Sannandrei (6), Biled (10), Sandra (7), Gavojdia (3), Opatita (2), Remetea Mare (3), Cheveresu Mare (6), Gataia (2)	Tormac (5), Nitchidorf (4), Sacosu Turcesc (5), Dumbrava (6), Manastiu (8), Percosova (2), Bara (9), Uivar (4), Cenei (5)
Dolj	Near rural towns	More distant
	Cosoveni (4), Breasta (6), Giurgita (11), Apele Vii (15), Bistret (6)	Gighera (10), Almaj (8), Calarasi (12), Plenita (17), Macesu de Jos (1)

Source: Own table.

Table 25: Bulgaria: Selected villages

NUTS 2 regions	NUTS 3 regions (Oblast)	NUTS 4 regions (Obshtina)	Villages (number of interviewed households)
North-West	Oblast Vidin	Obshtina Bregovo	Baley (2), Bregovo (9), Gamzovo (6), Vrav (3)
		Obshtina Gramada	Vodna (4), Gramada (7), Toshevci (3)
		Obshtina Novo Selo	Novo Selo (5), Florentin (6)
North-Centre	Oblast Vratsa	Obshtina Byala Slatina	Popitsa (7), Bardarski Geran (6), Barkachevo (3), Byala Slatina (2), Vranjak (8)
		Obshtina Krivodol	Glavatsi (5), Baurene (2), Pudria (7), Rakevo (5)
	Oblast Lovetsch	Obshtina Veliko Tarnovo	Resen (16), Pavel (5), Varbitsa (6), Gorski Dolen Trambesh (1), Polikraishte (11), Dolna Oriahovitza (6)
		Obshtina Polski Trambesh	
		Obshtina Gorna Oriahovitza	
		Obshtina Lovetsch	Alexandrovo (15)
		Obshtina Lenitsa	Letnitsa (14)
		Obshtina Lukovit	Dermantzi (12), Uglen (9)

Source: Own table.

- Out of the remaining villages, five villages near rural towns and five villages that are more distant were selected randomly (Table 24).

Where the enumerators could not find the pre-specified number of respondents or when additional households had to be interviewed because some households were disqualified, the next villages on the list were taken.

4.3.3 Bulgaria

Bulgaria opted for the following procedure, which is similar to the Polish one.

- In each NUTS 2 region, two NUTS 3 regions were selected randomly (Table 25).
- In each NUTS 3 region, two or three NUTS 4 regions were selected (Table 25). Since there was insufficient statistical information available on the rural or peri-urban character of the single regions, the regions were selected randomly. Villages and towns are very close to each other in Bulgaria. Usually, the distances between the nearest villages and the bigger town, i.e. the *obshtina*¹⁷ town, are no more than seven to ten kilometres. In some cases the distance between villages and *oblast* towns is from 45 to 60 km. But even in these cases, it takes less than one hour to go to the *oblast* town. In addition, it is not unusual for a village to be very close to two *oblast* towns. For example, the distance between the two *oblast* towns Vidin and Montana is about 80 km. Hence, some of the villages are closer than 50 km to the both cities. Therefore, the distance criterion was not used in the selection procedure.
- From the NUTS 4 regions, two to five villages were selected. The number of villages differs between the regions due to the number of SFHs per village. In the North-West region,

there were less than eight to ten SFHs per village. Thus, in the North-West, farmers from 18 villages were interviewed while in the North-Central region, farmers were chosen from ten villages.

4.4 Selection of Households

Precise reliable information on SFHs is sparse. As SFHs are usually not registered, it is difficult to identify the appropriate households for a survey. Therefore, the procedure for selecting SFHs for interview was agreed in outline and was adapted to national conditions according to interviewers' experiences. In each village, the aim was to interview eight to ten SFHs face-to-face. The following procedure was proposed for selecting the households:

1. A list of potential respondents using the following working definition for a SFH was compiled:

“A semi-subsistence farm household is an agricultural holding of size 1 to 4 ESU that markets a part of its agricultural production.”

The absolute threshold of 1 to 4 ESU is based on the implementation of EU Rural Development measures in Poland (the threshold used is 2 to 4 ESU) and in Bulgaria (where the threshold used is 1 to 4 ESU). For Romania, no country-specific threshold could be considered for the working definition since the Rural Development Plan was not just in force yet.¹⁸ ESU is an indicator that measures farm size in monetary values and had to be complemented by physical size measures like available land and number of livestock. Physical farm size measures were

17 Obshtina: NUTS 4 region in Bulgaria.

18 In spring 2008, the National Rural Development Programme 2007-2013 was approved by the EC. The threshold for eligibility for the transitional semi-subsistence measure is 2 to 8 ESU (NRDP 2008).

the basis of a pre-selection of potential SFHs using information from local agricultural administrations, national advisory services, and village mayors.

2. Eight to ten SFHs were randomly selected from the list.
3. Then, the enumerators approached the potential SFH directly and, after a brief introduction on the purpose of the interview, started the interview with the question: "Did you market a portion of your agricultural production in the last year?"
4. If the answer was "yes", the enumerators continued the interview; otherwise they went to the next household.
5. Additional SFHs were selected from the list where there were less than eight interviews in a village.

In Poland, the enumerators, experts from the local extension service, were therefore well informed about the local conditions and could a priori approximate the economic size of farms. Interviewers were asked to make a selection of farms so that the final structure of the sample was 20% of farms between 1-2 ESU, 40% 2-3 ESU and 40% 3-4 ESU. This was to make sure that the smallest farms were not under-represented in the sample. It was not possible to receive an official list of households because of strict regulations on personal data protection. Thus, a fully random selection of sample farms could not be accomplished. Instead, interviewers were advised to visit one out of every few farms in the location.

In Romania, there were a number of differences in the approach. As data about the potential SFH is kept within the General Directorates for Agriculture¹⁹ (GDA) in each county, key administration officers were first interviewed.

This resulted in a list of potential farms in different villages. Randomly, a number of villages were visited and the general methodology was applied. After all interviews in the first five selected villages were done, almost half the targeted number of farms were still missing in Timis county. Therefore, the initial list was inspected again and additional villages were randomly selected with respect to the criteria. This problem did not occur in Dolj county where the accuracy of the lists was more reliable, and in Dolj county the enumerators were accompanied by GDA officers who introduced them to the farmers. In Timis county, because of obsolete data from the GDA, there were situations in which the targeted farmers operated much bigger farms than described in the list. For both counties, but especially for Timis county, the data source could not be more accurate as the first direct payments for 2007 were to be operated only in March 2008 and earlier statistics did not distinguish between property (owners) and farming (farmers). Precise evidence of the distinction between farms and farmers was not recorded before 2008 by the GDA.

In Bulgaria, the selection procedure was successful due to the strong support from the Bulgarian Ministry of Agriculture. Enumerators received data on households in the main villages in each NUTS 4 region from the Regional Directorates for Agriculture and Food Supply. This data included a list of households in each village within the range of 1 to 4 ESU.

In Bulgaria there are ethnic minorities of Turkish and Roma people. They are not represented in the sample because they do not possess enough land and therefore are entirely subsistence farmers. Oblast Lovetsch is a mountainous region characterised by a few larger villages and very small villages with only 50 to 100 inhabitants. The field research was done in the larger villages resulting in a higher number of interviews per village.

The resulting samples are not considered to be representative; this was not the intention

¹⁹ General Directorates for Agriculture (GDA): local agricultural and rural development administration.

of the study. The intention was to capture the phenomenon of semi-subsistence in its various forms. Two reasons are given why IAMO, in agreement with IPTS, did not attempt to generate a representative sample:

- The phenomenon of semi-subsistence farming is still not well understood and not well documented by secondary statistics. It is impossible to plan a representative study without better knowledge of the population of semi-subsistence farmers in the respective countries.
- The sample size required by IPTS was 150 households for each case country.

4.5 Quality Control Aspects

Four measures were mandated in the project in order to ensure the quality of the survey data: (i) training of enumerators, (ii) pre-testing, (iii) field visits, and (iv) use of a data entry mask and plausibility testing.

Enumerator training was given by IAMO staff members in English, where necessary with an interpreter. The training lasted two days, and included an introduction to the project, explanation of the questionnaire, practical exercises and discussion of experiences. A field test on the second day showed that an average interview could be done within two hours.

The **pre-test** of the questionnaire occurred in mid-2007. It involved checking whether the questionnaire was applicable in real interview situations and whether the respondents understood and could answer the questions. It also provided an opportunity for enumerators to become familiar with the questionnaire. In Poland, the pre-test took place in both survey regions, involving four farmers in each region. The pre-test results were quite different for the two regions. As a result of the pre-test, the wording in the Polish version of the questionnaire was simplified. In

Romania, the pre-test took place in the Timis region. Difficulties occurred when precise figures were asked about harvested areas, prices, labour allocation, and expenditures. Romanian SFHs do not keep records and the figures given were estimates. There was a severe lack of information about future rural development policy measures. In Bulgaria, the pre-test was carried out in a NUTS 3 region within the survey region North-West (NUTS 2). Difficulties were observed when precise figures for arable land, prices, assets, and farm expenditures were asked for 2006. It was also difficult for the farmers to choose the right alternative when more than two facts were presented to them.

Three IAMO staff members were involved in the field visits, which took place in August 2007. The visitors participated in two interviews in Grodzisk Wielkopolski (Poznański) in Poland, Opatita (Timis) in Romania, and Polikraishte (Veliko Tarnovo) in Bulgaria. As a result, some adjustment to the sample in Romania was performed.

IAMO provided all project partners with a data entry mask designed to reduce data entry mistakes by ruling out implausible entries. The first plausibility test was done by the national partners, but an in-depth plausibility analysis was performed at IAMO. Each variable to be used in further calculations was checked using thresholds or plausibility algorithms.

One of the main tasks was to check the prices of agricultural products in the data base and determine reliable prices for goods that each household produced but did not sell. In such cases, the average of the relevant price in the data base was used. Where this was not possible due to missing prices or too small sample sizes, information was obtained from national experts. Otherwise, prices from FAO (2008) were used with the final price list being agreed with the national partners. Another important task was to make sure that farm production was fully compatible with the amounts recorded as utilised and sold.

Where plausibility tests raised queries that went beyond inputting errors, the national experts were approached and, if necessary, the respondents were recontacted. Given the time constraints of the

project, it was agreed to stop data cleaning at the point where confidence in the data was already good and where subjectively extra time for data analysis was considered to be more valuable.

Part 3: Typology of SFHs – Country Specific Characteristics and Viability

■ 5 Deriving and Interpreting a Typology for SFHs

The three country samples were pooled in order to construct a typology for SFHs. The pooled sample comprised 544 observations: Poland (N=175), Romania (N=184) and Bulgaria (N=185).

Section 5.1 explains the methodology adopted to construct the SFH typology. The four types of SFHs identified are described in Section 5.2, and their major socio-economic characteristics are discussed in Section 5.3. Section 5.4 gives a critical assessment of the observed viability of SFHs.

5.1 Methodology for Deriving a Typology for SFHs

The method used to identifying types of SFHs was cluster analysis. In the first step, Ward's method was applied to get a rough overview and calculate the arithmetic means of all standardised cluster variables. These arithmetic means were used in the second step to improve the allocation of SFHs to the various clusters by the *k*-means procedure. A detailed description of the methodologies is given in Annex 1 while Annex 2 reports the equations for calculating the parameters that were used in data analysis.

Cluster analysis is by its very nature an explorative procedure and has no methodology for statistical inference. The selection of the variables according to which the clustering is done influences the results of the cluster analysis. A different set of variables would result in a different typology, with some farms that are currently grouped together in the same type being

allocated to different types. Thus, there is no correct or incorrect set of variables. An important criterion for selecting the variables to be used is that they should be relevant to the issues at hand, and should result in a typology that is meaningful given the research question to be explored.²⁰ The variables that were used for identifying the SFH types for this study are therefore described in detail below.

- 1. Dependency ratio.** This is the share of persons older than 64 years and younger than 16 years as a proportion of the number of household members from 16 to 64 years old. This variable separates households with a higher share of dependent members from other households. Pure pensioner households and households with fewer members of economically active age have a higher dependency ratio. The strategies of these households are restricted by their lower labour capacity.
- 2. Highest formal schooling in households.** This variable stands for the basic component of human capital: education. The higher the educational level within a household, the more likely it can start non-farm income-earning activities. Also for decisions within farming, a higher educational level promotes farm development, e.g. by facilitating application procedures for subsidies. This variable distinguishes the households lacking education

²⁰ The variables for clustering were selected ex ante and approved by IPTS. They are based on a preliminary cluster analysis performed with project data for Polish and Bulgarian SFHs.

from the ones with a higher educational level. Together with the next variable (agricultural qualification of farm operators), it serves as an indicator for: (i) households that are characterised by a low formal education and low agricultural qualification, (ii) diversified households that are characterised by a high level of formal education, but a lower level of agricultural qualification, and (iii) households with an orientation towards agriculture that are often characterised by a lower level of formal schooling but a high level of agricultural training.

3. Agricultural qualification of farm operator.

This variable distinguishes the households with higher agricultural training from the ones without completed agricultural schooling. Higher agricultural training indicates an orientation towards agriculture, which may lead to the wish to develop a farm. Lower agricultural training may indicate those farmers who are forced to farm because they cannot do anything else, i.e. distress-push agriculture. It is assumed that households starting agriculture after transition, e.g. urban-rural migrants, will mainly have a lower degree of agricultural training.

4. Age of farm operator. This variable is the second basic indicator of human capital. Younger farmers are assumed to be more dynamic and willing to invest in agriculture. Together with the previous variable (agricultural qualification of farm operator), it is one factor influencing the likelihood of various household strategies for the respective types of SFHs. It also shows whether there is a change of generation imminent or whether it has already recently taken place.

5. Farm operator's experience as farm manager.

This variable distinguishes the experienced (having started prior to transition) and older farmers from those who started post-transition and younger farmers.

6. Share of non-farm net income (self-employment plus dependent employment) in household net income. The share of net income from non-farm income activities separates out the more diversified households.

7. Share of own consumed agricultural production in total agricultural production.

The higher the share of own-consumption in total agricultural production, the more subsistence-oriented the household is. Subsistence-orientation does not necessarily mean that the respective households are excluded from the market or deprived. There are many reasons for a higher share of own consumed agricultural production. Even well-off households may use a high share of their own agricultural production due to their philosophy of life or simply due to the smallness of their farm.

8. Households' cash balance. This variable distinguishes the households according to their cash surplus or deficit in 2006.

9. Economic farm size. The economic farm size comes as close to ESU as could be achieved with the survey data. By this measure the farms can be distinguished according to their sizes. Since this measure is not easily connected to the physical size of a farm, it is supplemented by the variable cultivated agricultural area.

10. Cultivated agricultural²¹ area per household.

This variable supplements economic farm size (measured in ESU) by a measure of the farm's physical size.

11. Share of crop production in total agricultural production. This variable indicates the

²¹ This measure includes the kitchen garden for all households. Usually, agricultural data bases do not include the kitchen garden as part of agricultural area. However, for SFHs in our study countries, subsistence production comes mainly from the kitchen garden, and therefore it is included in measured agricultural area for every SFH.

orientation of the farming system. It is expected that more subsistence-oriented households will have a smaller share of crop production.

12. Number of agricultural products. The more subsistence-oriented a household is, the more agricultural products it produces to meet the family's food demands. Market-oriented households are assumed to specialise in more profitable enterprises. It is therefore assumed that this variable helps to separate out more subsistence-oriented households from more market-oriented ones.

13. Share of social security benefits in household net income. This variable is expected to distinguish pensioner households and households suffering a handicap from economically active ones. It is therefore assumed to separate out a type of SFH characterised as having fewer options for development.

The variables were used in their standardised form. After outliers²² were excluded from the analysis, the sample consisted of 489 observations (158 households from Poland, 153 from Romania, and 178 from Bulgaria). Thus, the requirement of at least 150 households per country was met. The matrix of Pearson's correlation coefficients showed no correlations greater than 0.8, therefore all thirteen variables listed above were used in the cluster analysis.

5.2 Identified SFH types

Due to missing values, the sample size was only 380 households in the Ward analysis.²³ By

22 Households for which one of the standardised variables listed above lay outside the range (-3.0, +3.0) were considered to be outliers. An exception was made for the variable "dependency ratio". Pure pensioner households got a dependency ratio 3.0, and would have been eliminated as outliers from the analysis. However, since they were not outliers but meaningful, interpretable existing observations, they were kept in the sample.

23 Ward's analysis drops the household entirely from the analysis when a missing value is encountered.

contrast, since the *k*-means method excludes only pairwise missing values²⁴, all 489 households could be considered for the final cluster solution.

Cluster analysis provides multiple solutions and it is always a critical point to decide how many clusters are most suitable for answering a given research question. Generally, there is a trade-off between fewer clusters and greater internal homogeneity. Since cluster analysis is a purely exploratory procedure, it does not provide any hard rules for this decision. The approach taken in this study combined summary statistics with more qualitative reasoning. Qualitative considerations gave importance to deriving clusters that (i) are clearly separated from each other, (ii) are pronounced in at least one characteristic, and (iii) can be interpreted in a meaningful way. The first feature was tested by the Kruskal-Wallis test. A web diagram was used to assess the second feature, and for the third, it was verified that the clusters were such that they could be given informative names.

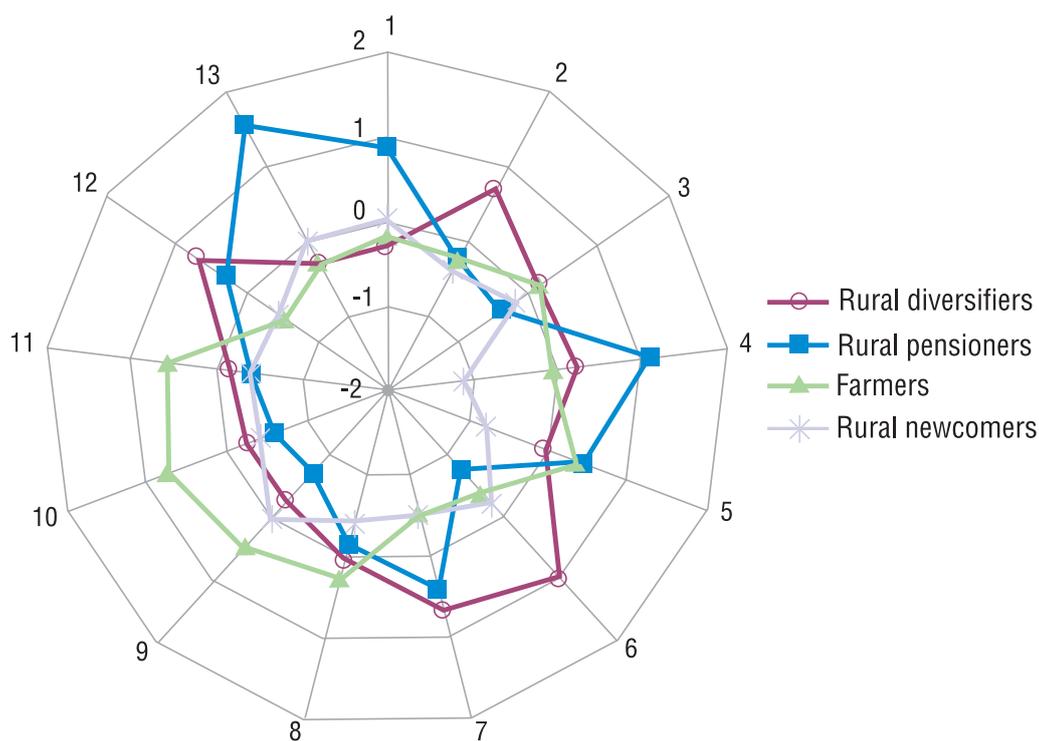
The solution with four clusters was considered to be the best according to the above criteria. All thirteen variables showed significant differences for at least two clusters. The web diagram (Figure 1) shows that all clusters are distinguished from each other according to certain characteristics. Moreover, the clusters could be named meaningfully according to the household and farm characteristics of their members, as follows:

- Rural non-farm oriented households (**rural diversifiers**²⁵, N=150),
- Rural pensioners and deprived households (**rural pensioners**, N=83),
- Large-scale semi-subsistence farm households (**farmers**, N=153), and

24 The *k*-means method allows the user to choose between different methods for treating missing values. The pairwise deleting procedure was chosen that kept all households in the sample and excludes only pairwise missing values in the calculation routine.

25 The clusters are described by appropriate longer names. For easier reading, their shorter names are used in the text.

Figure 1: Web diagram for SFH types



Notes: Names of axes: 1: dependency ratio, 2: highest formal schooling in the household, 3: agricultural qualification of farm operator, 4: age of farm operator, 5: farm operator's experience as farm manager, 6: share of non-farm net income in household net income, 7: share of own consumed agricultural production in total agricultural production, 8: household cash balance, 9: economic farm size, 10: cultivated agricultural area (ha), 11: share of crop production in total agricultural production, 12: number of agricultural products, 13: share of social security benefits in household net income.

Source: Own calculation with data from project survey.

- Rural households with undeveloped potential (**rural newcomers**, N=103).

Figure 1 shows the cluster centres for the thirteen standardised variables as identified in the final solution of the *k*-means method.

Table 26 shows the distribution of households among the four SFH types and the survey countries. Rural diversifiers and farmers are more numerous in the sample as a whole (although there are relatively very few in Poland and Bulgaria, respectively). Given the small sample size, it would be inappropriate to extrapolate these frequencies to the national populations. Thus, the fact that two-thirds of the Polish sample are classified as "farmers" and nearly three in four of the Bulgarian sample are classified as "rural pensioners" cannot be taken as characteristic of SFHs as a whole in these

countries. It is noteworthy that "rural newcomers" are well represented in all three survey countries (37 households in Poland, 36 households in Romania, and 30 households in Bulgaria).

5.3 Socio-economic Characteristics of SFH types

This section describes the four types of SFHs according to their most salient characteristics. This chapter portrays the SFH types according to their (a) household characteristics, (b) farm characteristics, (c) behavioural characteristics, (d) characteristics of the external environment, and (e) viability.

Tables with descriptive statistics for the relevant variables are found in Annex 3.

Table 26: Distribution of households among SFH types and survey countries

SFH types	Rural diversifiers		Rural pensioners		Farmers		Rural newcomers		Sample	
	N	%	N	%	N	%	N	%	N	%
Poland	8	5.3	10	12.0	103	67.3	37	35.9	158	32.3
Romania	63	42.0	12	14.5	42	27.5	36	35.0	153	31.3
Bulgaria	79	52.7	61	73.5	8	5.2	30	29.1	178	36.4
Total	150	100	83	100	153	100	103	100	489	100

Source: Own calculation with data from project survey.

Table 27: Viability measures for SFHs

Variables which describe viability
Viability considering net earned income
Viability considering net earned income plus received subsidies
Viability considering net earned income plus received social security benefits
Viability considering household net income

Note: Equations for calculating the measures are given in Annex 2.

Source: Own table.

Regarding viability, four different definitions are used in this report. Each of them consists of a ratio that compares a different definition of net income (numerator) to the household's living expenses (denominator). The first definition is the narrowest, and measures whether the household would be viable if it had to survive on net (unsubsidised) income earned from the farm and non-farm work. The broadest considers whether all sources of net household income taken together, including subsidies and social security benefits, are sufficient to cover household expenses (see Table 27).

Each SFH type is described below. Only those variables for which the sub-group as a whole shows a marked deviation from the sample average, and which therefore represent a defining characteristic for that type, are discussed. A large volume of information has been condensed in order to provide these succinct descriptions (see Annex 3)²⁶. All the group averages given below represent the median value for the SFH type.

5.3.1 Rural Non-farm Oriented Households (Rural Diversifiers, N=150)

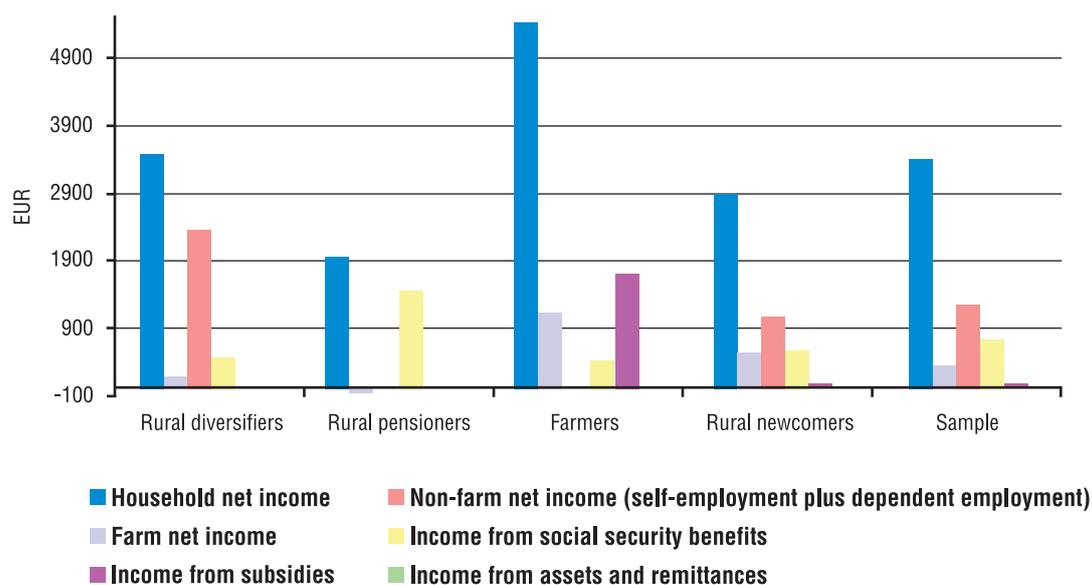
a) Household characteristics of rural diversifiers

Rural diversifiers have the highest level of formal schooling (other occupation-specific higher education) and the lowest dependency ratio (0.0) in the sample (indicating that they have the lowest number of dependent household members). In fact, most of these households have no dependent members, which may increase their opportunities for non-farm income-earning activities. They also have the highest average absolute annual non-farm income (2,350 EUR, Figure 2) and the highest average share of non-farm income in household net income (65.8%).

the median, the 5th and 95th percentiles, the mean rank in the Kruskal-Wallis test, and the number of valid observations, are shown, as well as the results of comparisons of means (Kruskal-Wallis test). For binary and nominal scaled variables, the percentage of observations in the respective category, the number of observations in the respective category, and the result of the Chi² test are reported.

²⁶ Annex 3 presents various descriptive statistics for each SFH type and for the whole sample. For all variables describing SFH socio-economic characteristics, behaviour and environment,

Figure 2: Composition of household net income in each SFH type in 2006



Note: The averages are median values.

Source: Own calculation with data from project survey.

Moreover, their agricultural production is mainly used for their own consumption, giving them the highest average share (68.7%) of own-consumption in total agricultural output in the sample. Consequently, the average share of farm net income in household net income (16.7%) is the lowest. The average number of rooms in family's residential house²⁷ (5 rooms) is the highest in the sample. This is considered to be an indicator of well-off households.

b) Farm characteristics of rural diversifiers

There are only two pronounced farm characteristics in this type of household. The number of agricultural commodities produced (on average, 17 products) is the highest in the sample, and the households have a rather low use of purchased input cost for animal production per unit of animal production value (ratio=0.11). These two variables, taken together with the

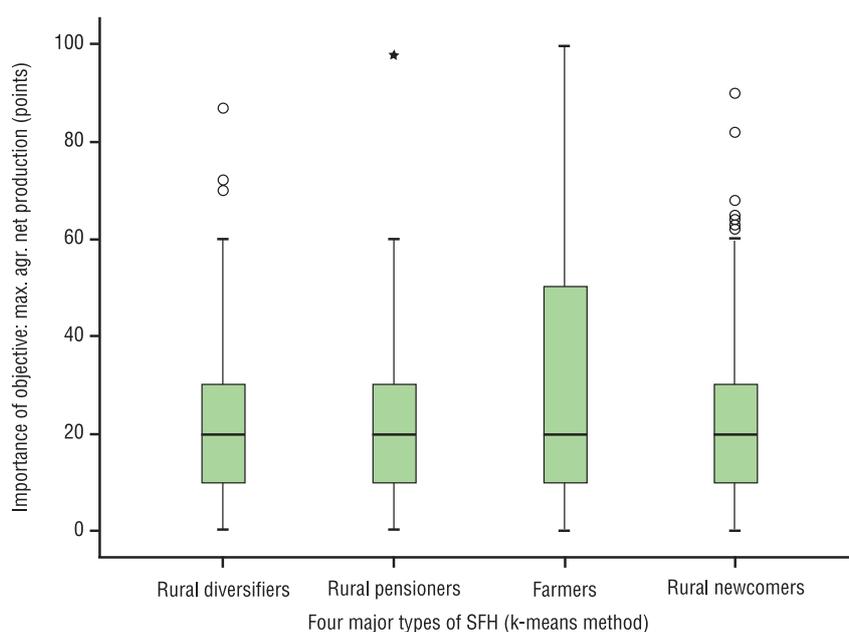
high share of own-consumed output, indicate a heavily subsistent farming system, with the main income coming from other sources. Diversifying agricultural production is also an indication of the wish to smooth consumption or income flows and reduce income risks.

c) Behavioural characteristics of rural diversifiers

This SFH type attaches the lowest importance among the four types to the objective "maximise agricultural net production" (Figure 3) and to the objective "maximise annual cash balance" (Figure 4). In contrast, the objectives "minimise agricultural labour input" is high (Figure 7), "maximise household's income" (Figure 6) and "diversify income sources" are all very important. This set of objectives underlines the orientation of these households towards income-earning activities other than farming. At the same time, the aim "have time for leisure activities" is also very important. Despite their income diversification, the aim "conserve the heritage" is more important for "rural diversifier" households than for the types

²⁷ The figure refers to rooms for living like sitting rooms, bedrooms, and children's rooms. It excludes bathrooms and kitchen.

Figure 3: Boxplot diagram: Objective “maximise agricultural net production”



Notes: ° and * stand for outliers. ° marks an outlier that is within the range of 1.5 to 3.0 times of the interquartile range. * indicates an outlier that is outside 3.0 times of the interquartile range²⁸.

Source: Own calculation with data from project survey.

“farmers” and “rural newcomers”. Furthermore, this SFH type has the highest share of households (36.9%) that plan to continue their farming activities in their present form. Nevertheless, there are also 39.6% of households that plan to extend or modernise their farming activities and 22.8% of households that plan to reduce or cease farming activities (Figure 10). Not having a successor is mentioned by only 20.6% of these households as a factor in the decision to cease or reduce farming activities.

This group has a slightly greater tendency to report having good relations with fellow small-scale farmers than do the rural pensioner and rural newcomer groups. A tendency for good community relations may also explain why rural diversifiers have the highest rate of membership in producer co-operatives²⁹ (14.0%). There is

also stronger interest in becoming a member of a producer co-op (10.9%) and the most interest (among the four groups) in becoming a member of a milk co-op (10.9%). As diversifiers, this group may feel that it does not have sufficient time to be informed about all matters related to farming and may expect that, as a member of a farming association, the household will automatically receive important information. At the same time, willingness to become a member in a marketing co-op is the lowest of the four groups (6.7%), which can be explained by the fact that the share of own- consumed agricultural production is relatively high in this group.

Bulgarian agriculture, inherited from the socialist era when agriculture was dominated by co-operatives and agro-industrial firms. Producer co-ops persist due to the fragmented land ownership. A typical co-op has more than 100 members, most of them living far away from their land in cities or too old to cultivate their land themselves. Members receive rent for their land in either cash or kind. **Milk co-operatives** are an important feature in Poland. They collect and process milk not only for their members but for all milk producers in their vicinity. Therefore, they were included in a separate category in the questionnaire. **Marketing co-operatives** are understood as voluntary associations of farmers for increasing their market power and marketing their products more efficiently.

²⁸ Interquartile range (IQR) is the difference of the 75th percentile and the 25th percentile.

²⁹ The questionnaire distinguished between producer co-operatives, milk co-operatives and marketing co-operatives in order to capture country-specific situations. **Producer co-ops** are one of the main structures in

The transitional semi-subsistence support measure was unknown to 81% households of this type. Amongst those who knew about it, 57% applied for it. The intended future application rate was a rather low at just over 22%. Rural diversifiers have the highest membership rate in political parties (19%).

d) Characteristics of the external environment of rural diversifiers

On average, rural diversifiers have a low share of social security benefits in net household income (10.5%). Also, the amount of received social security benefits (483 EUR) is well below the median value of the sample (718 EUR). Subsidies do not play a role in the household net income of rural diversifiers (Figure 2).

It takes household members considerable time to go to the next big urban centre - 40 minutes by public transport system, and 30 minutes by car. It can be concluded that the rural diversifiers live in more remote regions. This is surprising because 96% of the households earn non-farm income from dependent work and one would expect the less remote household to be more likely to embark on waged employment.

f) Viability of rural diversifiers (Table 28 and Figure 8)

In general, the majority of households of this type are not viable.

Rural diversifiers are the most viable of the four types of SFH when only the net earned income is taken into account (0.63). Also, when considering net earned income plus social security benefits received, rural diversifiers are more viable (0.81) than other households.

The strongest impact on households' viability is made by received social security payments. They raise viability to 0.81 (compared to 0.63 when only net earned income is considered). Subsidies received are less important. They only raise the viability to 0.69. Other income sources than net earned income, subsidies, and social security payments do not play an important role for the households because they increase viability only marginally to 0.89.

About one fifth of these households (22.7%) are viable when considering only net earned income. Social security payments raise the share of viable households to 34.7%, whereas the marginal contribution of subsidies received is quite small. Considering net household income, about two fifths of the households (39.3%) are viable.

5.3.2 Rural Pensioners and Deprived Households (Rural Pensioners, N=83)

a) Household characteristics of rural pensioners

On average, rural pensioner households are characterised by the highest dependency ratio (1.00) and smallest households (2 members)

Table 28: Number and percentage of viable SFHs

	Rural diversifiers		Rural pensioners		Farmers		Rural newcomers		Sample	
	N	%	N	%	N	%	N	%	N	%
Viability considering net earned income	34	22.7	1	1.2	25	16.3	9	8.7	69	14.1
Viability considering net earned income and subsidies received	38	25.3	2	2.4	56	36.6	18	17.5	114	23.3
Viability considering net earned income and social security payments received	52	34.7	17	20.5	47	30.7	20	19.4	136	27.8
Viability considering net household income	59	39.3	19	22.9	81	52.9	29	28.2	188	38.4

Source: Own calculation with data from project survey.

among the four groups. Furthermore, the farm operators have the highest average age (65 years) and the longest average experience in managing a farm (17 years). However, the level of formal agricultural qualifications of farm operators in this group is the lowest; they tend to have no formal training but only practical experience.

Rural pensioners have the lowest average net farm income (-39 EUR) and also the lowest annual net household income (1,969 EUR). The typical rural pensioner household has no non-farm income apart from unearned income in the form of social security benefits (Figure 2).

At the same time, households of this type have a high share of own-consumed agricultural production (64.6%).

b) Farm characteristics of rural pensioners

Rural pensioners tend to have the smallest farms in terms of economic farm size (1,656 EUR) and cultivated agricultural area (1.08 ha). Their

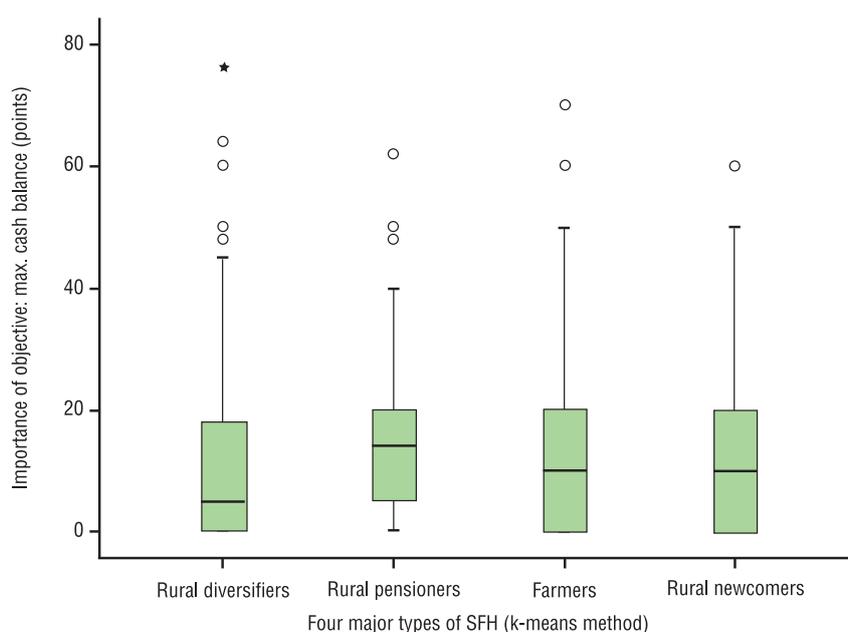
share of crop production in total agricultural production is low (32.7%), while the use of purchased inputs for animal production per unit animal production is the highest of the four types (ratio=0.18).

c) Behavioural characteristics of rural pensioners

Rural pensioner households give the highest rating to the objective “maximise annual cash balance” (Figure 4) and, not surprisingly, they also rate the objective “minimise agricultural labour input” highly (Figure 7).

The aims “diversify income sources”, “provide for the next generation”, “provide children with a good/higher education”, and “have time for leisure activities” are of lower importance for the SFH type. The aim “conserve the heritage” is of higher importance than for the “farmers” and “rural newcomers”. This can be interpreted as a sign that pensioners tend to be more conservative.

Figure 4: Boxplot diagram: Objective “maximise annual cash balance”



Notes: ° and * stand for outliers. ° marks an outlier that is within the range of 1.5 to 3.0 times of the interquartile range. * indicates an outlier that is outside 3.0 times of the interquartile range.

Source: Own calculation with data from project survey.

Households of this type have the lowest rate and frequency of co-operation with fellow small-scale farmers, large-scale private farmers, and corporate farmers of all four SFH types. Nevertheless, they report the highest willingness to become a member in producer co-op (16.0%) of the sample. Furthermore, there is interest in becoming a member in a milk co-op (7.6%) and a women's association (9.8%). This could indicate their willingness to socialise, rather than an economic motivation.

Rural pensioners plan more often than other household types to reduce or cease farming activities (39.7% of the households). More than half these households (54.5%) give not having a successor as a reason for their intention. Surprisingly, 26.4% of the households plan to extend or modernise their farm (Figure 10).

The transitional semi-subsistence support measure is not well known among this group, i.e. 69.6% of households were not aware the measure. Only one third of the households that knew the measure actually applied for it. However, over 41% of households plan to apply for it in the future. This group has an above-average rate of membership in political parties (15.7%).

d) Characteristics of the external environment of rural pensioners

Not surprisingly, rural pensioners have the highest average share of social security benefits in net household income (64.6%) and also the highest average amount of received payments (1,439 EUR). Subsidies do not play a role for the household net income of rural pensioners (Figure 2).

Rural pensioner households face a lower median frequency of public transport facilities to the next big urban centre, but with four opportunities per day one cannot say that they are cut off. The average distance to the agricultural extension service (14 km) may curb the development of farms for deprived but non-pensioner households.

e) Viability of rural pensioners (Table 28 and Figure 8)

More than three quarters of the rural pensioners are not viable.

With respect to net earned income, their average viability is only 0.08, which is significantly the lowest level among all four SFH types. The same is true for net earned income plus subsidies received (0.16), and also when the whole net household income is taken into account (0.65).

Social security benefits received account for a steep increase in viability, from 0.08 to 0.59. On the other hand, subsidies received only increase viability to 0.16. Other income sources also contribute relatively little to these households' viability.

Only 1.2% of the rural pensioner group earn enough income to cover their living expenditure. The situation changes when a household receives social security payments. Taking these payments into account, one fifth of rural pensioners (20.5%) are viable, whereas access to subsidies does not affect the viability: only 2.4% of households are viable when receiving only subsidies in addition to their net earned income. Taking all income sources into account, about 23% of this group are viable.

5.3.3 Large-scale Semi-subsistence Farm Households (Farmers, N=153)

a) Household characteristics of farmers

These farmers are characterised by the highest average level of agricultural qualifications of farm operators (trained in short courses) and length of experience managing a farm (18 years).

The share of net farm income in net household income is high at 36.5% compared to rural diversifiers and rural pensioners. Moreover, the average absolute net farm income is the highest of the four types (1,125 EUR). This indicates that these households are oriented towards agricultural

production and commercialisation, which is confirmed by their having the lowest average share of own-consumed agricultural production (38.8%) of the four types. More than half the farmers in this sample group have no non-farm income; nevertheless, the group has the highest average annual net household income (5,413 EUR, Figure 2), and the highest average household cash balance (70 EUR), of the four types.

Furthermore, these households are more often headed by women (22.2% of households) than the other types.

b) Farm characteristics of farmers

The “farmers” operate the largest farms in terms of average economic size (4,668 EUR) and cultivated agricultural area (7.04 ha). Their average cost of agricultural production (variable costs: 1,680 EUR, other farming costs: 1,025 EUR, Figure 5) is the highest of the four types. These SFHs have the highest averages for the share of crop production in total agricultural production (55%), the highest average yields for maize

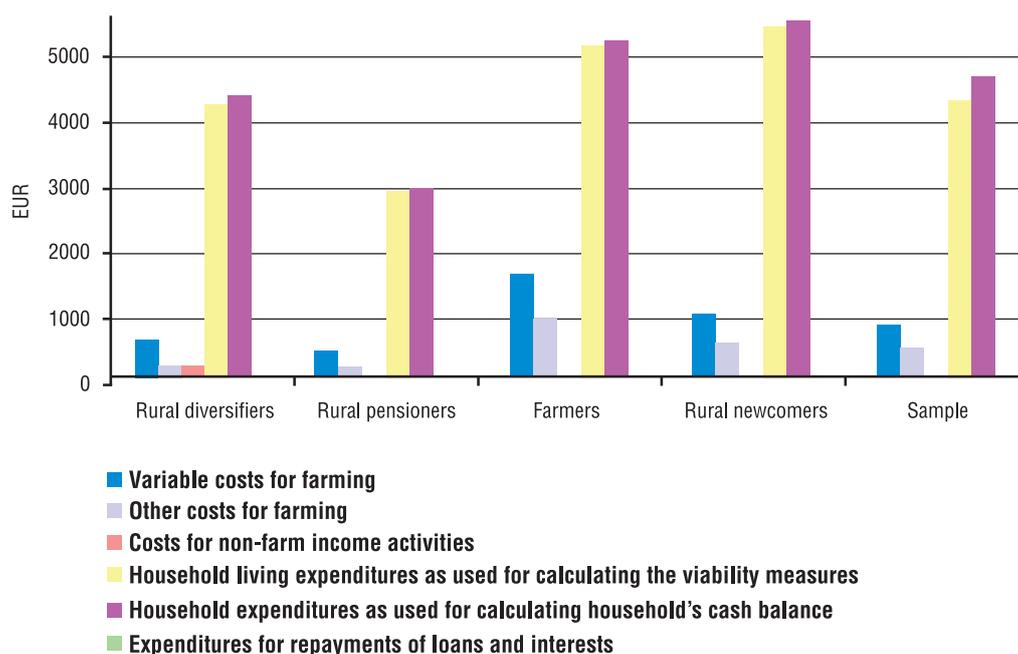
(50.0 dt/ha) and wheat (30.0 dt/ha), and produce a below-average number of agricultural products (10 products), showing that they are more specialised in crop production. Despite a low ratio of purchased inputs for animal production per unit of animal production value (average ratio=0.14), these households also achieve the highest average milk yield (3,200 l/dairy cow) in the sample.

Most sample SFHs in the farmer category are from Poland. Since land quality is on average lower in Poland than in the other two countries, this causes a country effect for the variable “land quality”, which is the lowest in the sample for this SFH type.

c) Behavioural characteristics of farmers

This group of households gave the objective “maximise agricultural net production” the highest importance in the sample (Figure 3), whereas they attach low importance to the objective “minimise agricultural labour input” (Figure 7). At the same time, they give high importance to the objective

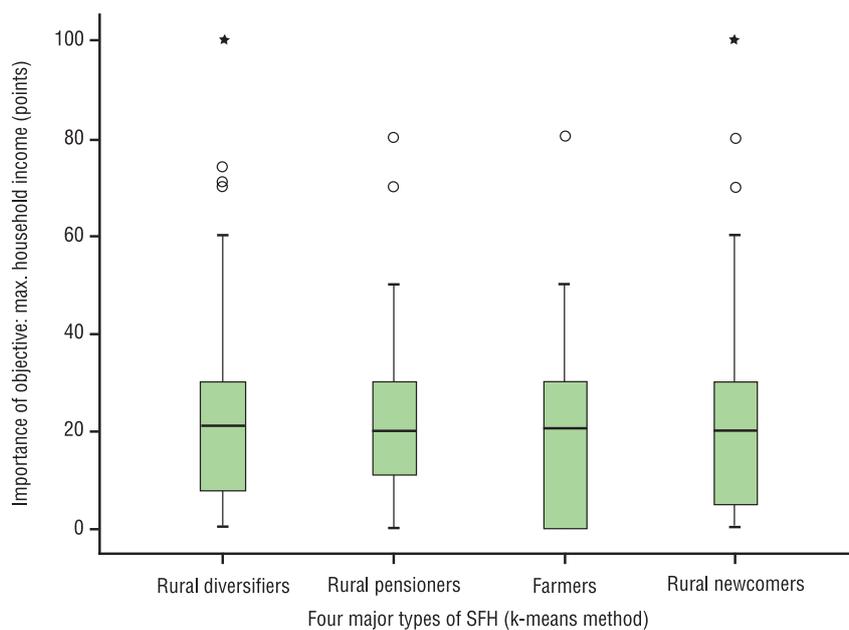
Figure 5: Costs*) and household expenditures for each SFH type in 2006



Notes: The figures are median values. *) The single positions are not mutually exclusive.

Source: Own calculation with data from project survey.

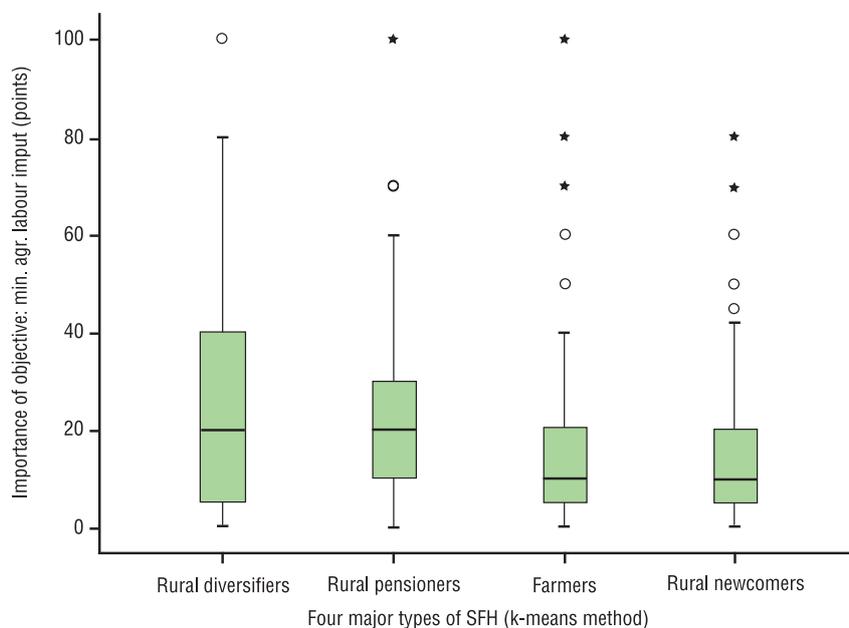
Figure 6: Boxplot diagram: Objective "maximise household income"



Notes: ° and * stand for outliers. ° marks an outlier that is within the range of 1.5 to 3.0 times of the interquartile range. * indicates an outlier that is outside 3.0 times of the interquartile range.

Source: Own calculation with data from project survey.

Figure 7: Boxplot diagram: Objective "minimise agricultural labour input"



Notes: ° and * stand for outliers. ° marks an outlier that is within the range of 1.5 to 3.0 times of the interquartile range. * indicates an outlier that is outside 3.0 times of the interquartile range.

Source: Own calculation with data from project survey.

“maximise non-farm income” (Figure 9) and low importance to the objective “maximise household income” (Figure 6).

Farmers attach the highest importance of all four groups to the aim “provide for the next generation”; moreover, it is also important for these households to “provide children with a good/higher education” and to “have time for leisure activities”. Yet, the aim to “conserve the heritage” is not as important as for “rural diversifiers” and “rural pensioners”. Taken together, the stated aims of this household group indicate more development- and future-oriented households for which tradition does not play a dominant role.

The development and farming orientation of the farmer households is also expressed by a strong integration of these households in networks. Hence, they have the highest membership rates of the whole sample in milk co-operatives (11.1%), in savings and credit co-operatives (9.2%), in agricultural associations (12.4%), and in women’s associations (9.8%). Furthermore, they stated a strong interest in participating in a marketing co-op (15.9%) and in becoming a member of a women association (11.6%) in the future.

These households’ relationships with fellow small-scale farmers are slightly better than for “rural pensioners” and “rural newcomers”. In addition, “farmer” SFHs co-operate more often with fellow small-scale farmers, large-scale private farmers, and corporate farmers than the households in the other three types of SFHs.

They also have the highest membership rate in input supply co-ops (3.9%) (the membership rate for the whole sample is only 1.8%). By contrast, their membership rate in producer co-ops is the lowest of the four groups at 0.7%; however, this may be a country effect, as there are no producer co-ops in Poland and the majority of households in this cluster are in Poland.

A high share of households (44.3%) in the farmer group plans to extend or modernise their

farm. By contrast, 27.5% of the households stated that they intend to reduce or cease their farming activities (Figure 10), with half of them giving as the reason that they do not have a successor.

Finally, three-quarters of farmer households (74.6%) are aware of the transitional semi-subsistence support measure, which is the highest share among the four types. Moreover, the application rate among the households who know about this measure is the highest in the sample (77.8%). Only 15.4% of the households plan to apply for it in the future.

d) Characteristics of the external environment of “farmers”

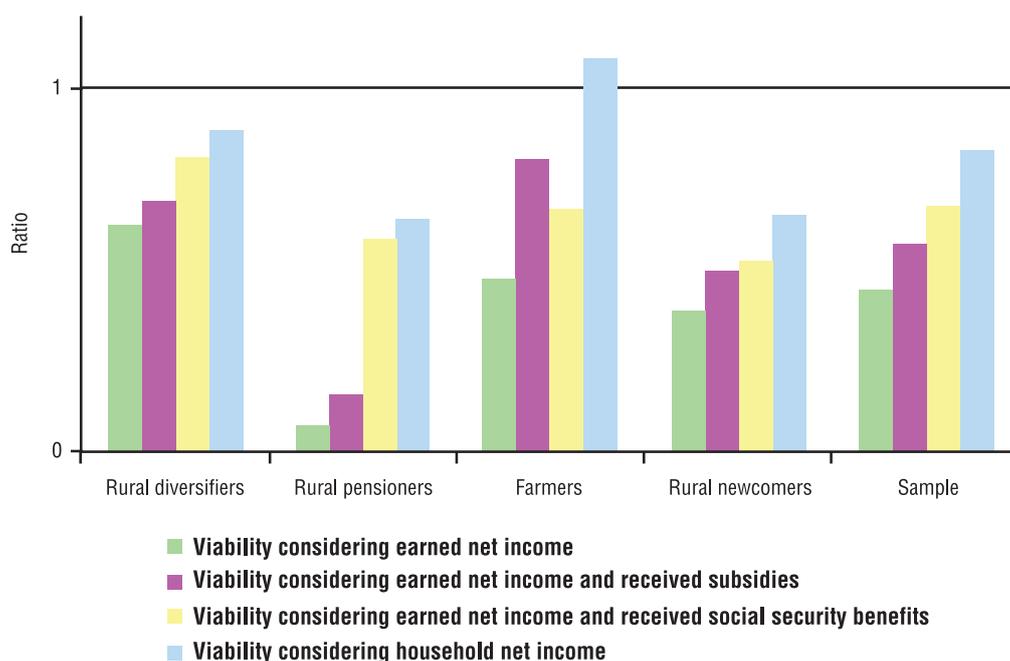
On the one hand, the farmer group received the largest amount of subsidies (on average, 1,707 EUR, Figure 2) of the four types, and these subsidies contributed a considerable share (24%) of average net household income. On the other hand, this group has the lowest median share of social security benefits in net household income (8.3%). Also, given the amount of money received (on average, 403 EUR), these farmers appear to be less dependent on the social security network than the other three types of SFH.

The shortest average distances to the agricultural administration (12 km) and to the agricultural extension service (5 km) may have supported the good income position of farmer households compared to the other three types of SFH. Their household members enjoy the highest frequency of public transport to the nearest big urban centre, and, in addition, it takes them the least average time to go to the nearest big urban centre by bus (30 minutes) or by car (20 minutes). So, it can be concluded that farmers live in less remote regions and have a good infrastructure available.

e) Viability of farmers (Table 28 and Figure 8)

The only income definition according to which at least half the farmer households

Figure 8: Viability of each SFH type in 2006



Note: The figures are median values. A ratio of 1.0 indicates that at least half of the households are viable.

Source: Own calculation with data from project survey.

are viable is net household income (median viability=1.09), and they are by far the most viable group with respect to this income measure. Comparing the median viability based on other income definitions across the four SFH types, farmers also have the highest viability with respect to net income plus subsidies received (0.81); however, when viability is compared in terms of median net earned income, and median net earned income plus social security payments, farmer households do not perform as well as rural diversifiers.

The median viability of farmer households, when only net earned income is considered, is only 0.48. The income component that makes the largest additional contribution to viability is subsidies: adding subsidies to net earned income raises the group's median viability to 0.81, whereas adding social security payments increases median viability to only 0.67.

Farmers' net earned income covers household living expenditures only for 16.3% of the farmers. Both types of transfer payment (subsidies and

social security payments) contribute significantly to viability, but subsidies have the stronger impact. Including only subsidies with net earned income raises the share of viable households to 36.6%, whereas including only social security payments raises this share to only 30.7%. Considering all income components shows that half the farmers are viable. No other SFH type has such a high share of viable households.

5.3.4 Rural Households with Undeveloped Potential (Rural Newcomers, N=103)

a) Household characteristics of rural newcomers

These households are characterised by somewhat younger and less educated members. On average, they have the youngest farm operators (35 years), have the least experience in managing a farm (9 years), and have the lowest level of formal schooling (secondary school). Rural newcomers have the highest average number of household members (4 persons) among the four household types.

Rural newcomers produce mainly for the market and have a low average share of own-consumption in total agricultural production (40.9%), while the average share of farm net income in household net income is high (35.7%). At the same time, the level of median annual non-farm net income (1,068 EUR, Figure 3) indicates that half the rural newcomer group achieves at least this level of non-farm net income. It is, however, less than half the median level for the rural diversifiers. For comparison, in the other two SFH types, less than half the group has any net non-farm income. Despite this above-average degree of diversification, more than half these households have negative household cash balances, and their median value (-1,907 EUR) is the lowest of all four groups, indicating that the majority is not able to derive sufficient income either from farming or from other income sources.

b) Farm characteristics of rural newcomers

Rural newcomers have a low average share of crop production in total agricultural production

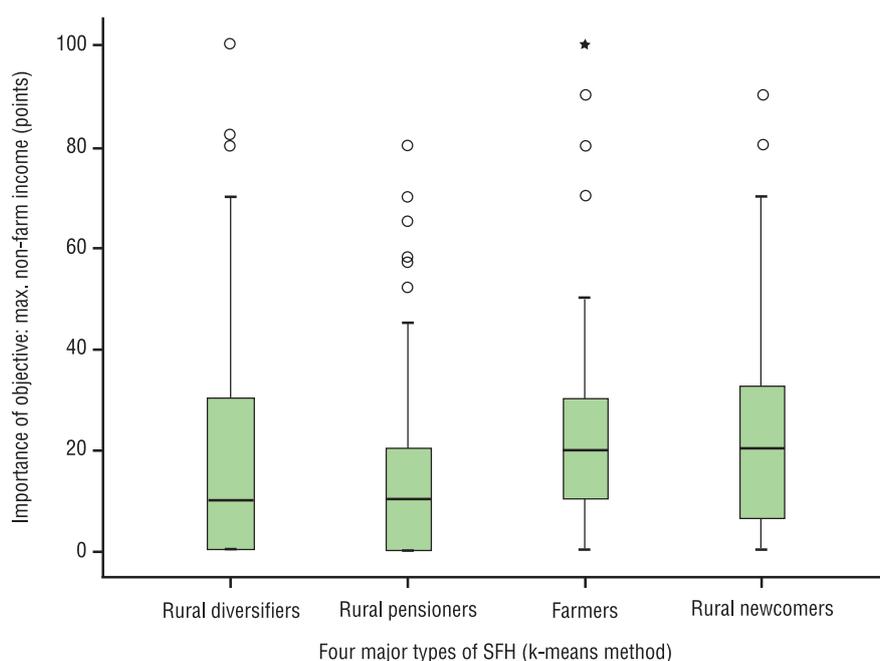
(30.5%) and produce only a small number of agricultural products (10 products).

c) Behavioural characteristics of rural newcomers

Rural newcomers attach high importance to the objective “maximise non-farm income” (Figure 9). They give low importance to the objective “minimise agricultural labour input”. Also, the aim to “have time for leisure activities” is less important for them than for rural diversifiers or farmers. This group also considers the aim to “provide children with a good/higher education” of high importance, whereas the aim to “conserve the heritage” is less important for them than for “rural diversifiers” and “rural pensioners”.

Rural newcomers have a high membership rate in milk co-operatives (7.8%) compared to rural diversifiers and rural pensioners. In addition, they have an above-average membership rate in agricultural associations (6.8%) and the highest willingness to participate

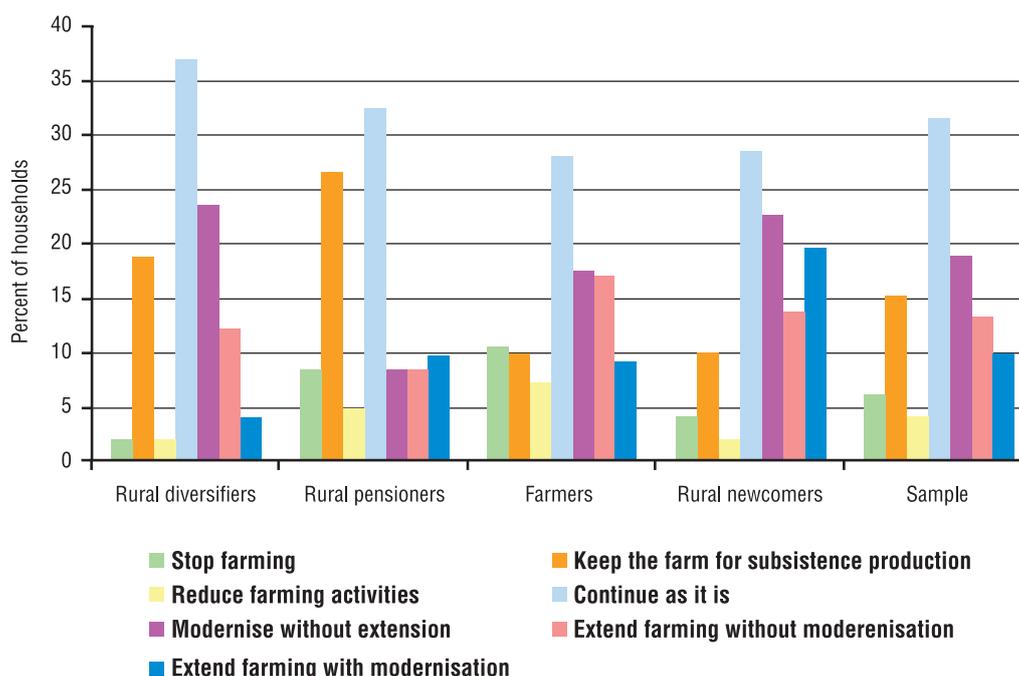
Figure 9: Boxplot diagram: Objective “maximise non-farm income”



Notes: ° and * stand for outliers. ° marks an outlier that is within the range of 1.5 to 3.0 times of the interquartile range. * indicates an outlier that is outside 3.0 times of the interquartile range.

Source: Own calculation with data from project survey.

Figure 10: Future intentions for the farm for each SFH type



Source: Own calculation with data from project survey.

in marketing co-ops (16.5%). Their interest in joining a women’s association (8.8%) is also greater compared to the other SFH types. No rural newcomer household is a member in an input supply co-operative.

Their greater willingness to supply labour on the farm and their strong aim to provide a better education for children, as well as their increased membership rate in co-operatives, indicate that these households tend to follow a development strategy. This is supported by their having the highest share of households (55.8%) planning to extend or modernise their farm and the lowest share of households (15.7%) planning to reduce or cease farming activities (Figure 10) among the four groups.

“Not having a successor” is of minor importance for the decision to cease or reduce farming activities, and is mentioned by only 18.8% of households.

Half the households in this group (51.7%) were not aware of the transitional semi-subsistence support measure; only half of those

that knew of it actually applied for it, and only half the households plan to apply for it in future.

d) Characteristics of the external environment of rural newcomers

Social security benefits are on average 18.9% of net household income for this group, a more important income source than subsidies received, which contribute only 2.7% to net household income. In absolute terms, the median values of these two income sources were 589 EUR for social security payments and 100 EUR (Figure 2) for subsidies.

The average distances to infrastructural facilities like primary and secondary schools, general practitioners, and hospitals are greater than for other SFH types, which indicates that rural newcomers tend to live in more remote regions.

e) Viability of rural newcomers (Table 28 and Figure 8)

The majority of rural newcomers are not viable according to any of the measures.

Comparing median values across SFH types, rural newcomers have the lowest viability with respect to net earned income plus social security benefits (0.53), whereas their viability in terms of household net income (0.65) is comparable to that of rural pensioners (0.65).

Considering only net earned income, the viability of the lowest performing half of this group does not exceed 0.39. Subsidies and social security payments add equally to household's viability raising the median viability to 0.50 and 0.53, respectively. Considering all income sources, however, median viability reaches only 0.65.

Net earned income covers living expenditure for only for 8.7% of the households of this type. Subsidies and social security payments have similar effects on the share of viable households. Subsidies in addition to net earned income increase the share of viable households to 17.5%, and social security payments in addition to net earned income make 19.4% of rural newcomers viable. Over one quarter of the households (28.2%) are viable when all income sources are taken into account.

5.4 Critical Assessment of the Viability of SFHs

The high percentage of non-viable households raises questions about the reasons for such low levels of observed viability, and why these households still exist. The project's national experts were asked to react to the following four questions:

- Was agricultural production in 2006 affected by bad weather conditions?
- How should the income figures given by respondents be assessed?
- How should household expenditures be assessed?
- Why do such households still exist? Or in other words, how do these households manage to survive?

Was agricultural production in 2006 affected by bad weather conditions?

Weather conditions were not favourable for agricultural production in Poland in 2006, and

Table 29: Wheat and maize yields (dt/ha) and production (1,000 t) in the countries surveyed

		2004	2005	2006	Figure in 2006 compared to 2004 (%)	Figure in 2006 compared to 2005 (%)
Poland						
Maize	Yield (dt/ha)	56.9	57.3	41.6	73	73
Maize	Production (1,000 t)	2,344.0	1,945.4	1,260.7	54	65
Wheat	Yield (dt/ha)	42.8	39.5	32.4	76	82
Wheat	Production (1,000 t)	9,892.5	8,771.4	7,059.7	71	81
Romania						
Maize	Yield (dt/ha)	45.5	39.8	35.8	79	90
Maize	Production (1,000 t)	14,541.6	10,388.5	8,984.7	62	87
Wheat	Yield (dt/ha)	34.8	30.0	27.7	80	92
Wheat	Production (1,000 t)	7,812.4	7,340.7	5,526.2	71	75
Bulgaria						
Maize	Yield (dt/ha)	55.4	53.1	45.3	82	85
Maize	Production (1,000 t)	2,123.0	1,585.7	1,587.8	75	100
Wheat	Yield (dt/ha)	38.1	31.6	34.0	89	108
Wheat	Production (1,000 t)	3,961.2	3,478.1	3,301.9	83	95

Source: FAO (2008).

in Romania and Bulgaria in 2005 and 2006. Very low winter temperatures were followed by floods in spring and droughts in summer, which reduced grain yields and harvested quantities in all three survey countries.

Table 29 gives an overview of wheat and maize yields and production quantities from 2004 to 2006. It shows not only a sharp drop in grain yields in 2006 compared to 2004, but an even sharper decline in grain production. It can be expected that small-scale farmers in particular tended not to sell any produce under these conditions until they had taken care of the consumption needs of their own households.

How should the income figures given by respondents be assessed?

Here, a distinction between net farm income and non-farm net income should be made. With respect to net farm income, it is important to bear in mind that small-scale farmers do not keep any records on production and sales. They usually sell irregularly and due to the low quantities produced, a small mistake in absolute numbers for quantities sold or prices received may result in an erroneous negative final cash balance. Moreover, it is typical of human beings, and especially farmers, to complain more about their financial situation than appears warranted according to objective criteria. There is a tendency to underestimate production and financial returns, and to overestimate production expenditure. Nevertheless, despite these subjective considerations, there is still an objective reason for lower sales in 2006, as discussed in the previous paragraph.

Considering non-farm net income, it has to be admitted that some households might not have revealed in the survey other sources of earned income, such as those from the black economy. The lack of employment at the beginning of transition prompted many urban families to return to rural areas where they still had relatives or access to agricultural land. Some of these migrants were continuing urban jobs and in

certain situations those jobs were not necessarily officially declared. It can be assumed that reinforcement of the regulatory framework and labour monitoring lowered the number of such cases during the more recent years. Nevertheless, there are still a number of employees who do not declare their incomes as such and are not legally recorded. Other reasons for not mentioning income could be to avoid taxation or to qualify for social aids within the community.

Other income sources, such as remittances and revenues from savings and assets, are difficult for the enumerators to assess and their value may therefore be subject to underestimation. This holds especially true for in-kind remittances, which are usually not remembered and also not considered to be income.

How should household expenditure be assessed?

In general, households neither keep records of their expenditure nor their income. While income figures are subject to underestimation, overestimation of expenditure seems a trait of human psychology. For expenditure, a distinction between farming costs and other expenditure including housekeeping should be made. For farming, the adverse weather conditions in 2006 caused higher expenditure per unit of output than could be expected at the beginning of the year. Moreover, the higher costs of inputs bought in autumn 2006 for the next cropping season were not covered by product prices from summer 2006, thus worsening cash balances. Some personal expenditure, such as mobile phone fees or hairdressing costs, may be personally paid by family members, who did not take part in the interview so that the figures given were only rough estimates by respondents. Moreover, the questions asked for monthly expenditure and respondents may have simply rounded up the figures or mentioned yearly expenditure.

Why do such households still exist? How do these households manage to survive?

Median net household income in the sample is 3,438 EUR, which is about 78% of median household living expenditure of 4,409 EUR. Given that the median net household income and median net household expenditure may not refer to the same household, median viability from all income sources may be higher or lower than this ratio. In fact, it is 0.83. Furthermore, the range is wide: the measured viability of the least viable 5% of households did not exceed 0.08 and that of the most viable 5% was at least 1.89.

Various reasons listed above suggest that the true value of the annual household cash balance for some households might be different from the value calculated from the recorded survey data. The “hidden” part of income cannot be determined under the current circumstances, but it is reasonable to assume that household cash balances are indeed higher than observed in the surveys.

Furthermore, leaving aside the issue of data accuracy, it is important to recognise that these figures give a snapshot for one year only, and do reveal neither how the parameters of the distribution of viability vary from year to year, nor whether the same households always occupy the same relative positions in the distribution. Since no panel data with respect to this question are available from the survey, one can only speculate in fairly general terms.

It is possible that, in a single year, a given household’s income may be sufficient to cover all living expenditure, while in the following year its expenditure may exceed the income. If on a regular basis the surplus from one year is sufficient to cover the deficit in the following year, this would explain how apparently non-viable households in the sample manage to survive. If households regularly use past savings, or incur liabilities that would have

to be paid back in the following year, this implies that their position in the distribution of viability does not remain constant from one year to another.

Moreover, although, statistically, the majority of semi-subsistence farm households appear to have negative household cash balances, there are no situations recorded where these households were unable to cover their living costs, such as bills for electricity, gas, and water, and their living standards were not consistently falling. Considering the low level of credit access for rural households and the expenses these families face on a continuous basis, whether for income-generating activities or for their basic living requirements like shelter and transport, it has to be concluded that these households dispose of some ready cash. Assuming that loans are informally granted by neighbours or friends, the recipients of such loans would have been assessed for their risks prior to being given the informal credit, just as financial institutions do for formal credit. This is not consistent with the hypothesis that the borrowing households have chronic negative balances, but rather suggests that they are temporary and generated by exceptional situations. Therefore, despite the relatively difficult situation in agriculture, experience suggests that there are indeed households that manage to cope with fluctuating incomes and recurring periods of non-viability and negative cash balance; this is supported by the continuing existence of such farms even if their opinions about economic conditions are rather catastrophic.

The assessment and discussion in this section is based on the observations and experience of the project experts. Informal discussions relevant to the topic were also taken into consideration. Clearly, the issues raised here could be a rewarding topic for further research, especially in the New Member States.

■ 6 Country Specific Behaviour and Viability within SFH types

Before starting the policy simulation, it is useful to consider other factors, apart from those used in the cluster analysis to identify the four SFH types that may influence households' response to external incentives like policy measures. Here, the behavioural characteristics of households (their objectives, motivation, future expectations and so on) were thought to be the most important additional source of information for interpreting differing model results. These behavioural characteristics may vary not only between SFH types but also between the three survey countries. In order to obtain an overview of the distribution of these more subjective, qualitative factors, 18 variables describing household objectives and aims, future intentions of the households concerning the farm, awareness of the transitional semi-subsistence measure, and intended future application for this measure were analysed.

The target indicator for assessing the development scenarios is viability. Since this measure is so crucial for this study, and the previous chapter has already shown that most of the households are non-viable, additional country-specific differences in viability are explored. All four viability measures from Table 27 are used in the analysis.

Given the large amount of information, the following comments are limited to highlighting and interpreting divergences when they occur. The figures given in the text are median values. Detailed tables are given in Annex 3. All comparisons between countries refer to SFHs of the same SFH type. That is, no between-type comparisons, such as between Polish rural diversifiers and Romanian rural newcomers, are drawn.

Section 6.1 covers household behavioural characteristics, and SFHs' viability is analysed in Section 6.2. Section 6.3 sums up the chapter.

It is important to bear in mind that, when the sample is broken down by country within each SFH type, some very small subgroups result. Not only are these groups so small that their intrinsic representativeness may be problematic, but also the comparison of results across subgroups of such different sizes is a further concern. Therefore, what follows should be treated as a description of this particular sample and not as a set of characteristics from which more general inferences can be reliably made.

6.1 Household Behavioural Characteristics

Household behavioural characteristics are assessed in the three categories: (i) objectives and aims (see tables in Annex 3), (ii) future intentions for the farm (see Figure 11 to Figure 14 and tables in Annex 3), and (iii) transitional semi-subsistence support (see tables in Annex 3). In category (i), each of the five objectives (maximise agricultural net production, maximise non-farm income, maximise household income, maximise annual cash balance, and minimise agricultural labour input) was ranked in relation to the other four by distributing 100 points among all five objectives. In addition, the ten aims (diversify income sources, be rooted to the soil, enjoy rural lifestyle, be respected in the village, conserve the heritage, keep up the family's traditions, provide for the next generation, provide children with a good/higher education, avoid taking advances, and have time for leisure activities) were ranked independently of each other on a scale from 1 (not important at all) to 5 (very important). In category (ii), future intentions for the farms are assessed according to seven options (cease farming, keep the farm for subsistence production, reduce farming activities, continue without change, modernise without extension, extend farming without modernisation, and extend farming with modernisation). The percentage of

households choosing each category is discussed. For category (iii), only two variables are reported: first, whether or not the household knew of the transitional semi-subsistence support measure is examined, and second, whether, after they are all informed about it, they intend to apply.

Apart from the aim “provide for the next generation”³⁰, all above-mentioned variables show sizeable differences between the three countries regarding at least one SFH type.

6.1.1 Rural Diversifiers

Polish rural diversifiers (N=8)

Objectives and aims

Polish rural diversifiers gave the objective “maximise non-farm income” 45 points, which is the highest value of all three countries. At the same time, the objective “minimise agricultural labour input” is of the lowest importance at 7.5 points.

The aim “diversify income sources” was rated as important, but it was rated lower than by Romanian rural diversifiers.³¹ Aims that reflect non-monetary values and norms like “be rooted to the soil”, “enjoy rural lifestyle”, “be respected in the village”, and “conserve the heritage” were given the least importance in Poland, although the aim to “be respected in the village” was considered important. The aim “have time for leisure activities” was rated as neither important nor unimportant, that is, the lowest rating of all three countries amongst rural diversifiers.

Future intentions for the farm

The most preferred future option for the farm is to keep it, but to operate it only on a subsistence level (38% of households, Figure 11). By contrast,

scenarios that require farm investments³² were preferred by 28% of the households. One quarter of households intended to continue with their farming activities at the current level. Since the number of observations is rather small with only eight households, care should be taken in extrapolating the observed future intentions to larger samples.

Transitional semi-subsistence support

Most Polish rural diversifiers (88%) were aware of the transitional semi-subsistence measure. Only one household in the sample was eligible for it in future, but did not intend to apply.³³

Romanian rural diversifiers (N=63)

Objectives and aims

On the one hand, Romanian rural diversifiers gave the objective “minimise agricultural labour input” 40 points. That is the highest rating of all three survey countries. On the other hand, the objectives “maximise non-farm income” and “maximise annual cash balance” got no points.

The aim “diversify income sources” was also rated as very important. This too is by far the highest rating of the three countries.³⁴ Aims that reflect philosophy of life like “enjoy rural lifestyle”, “be rooted to the soil” and “be respected in the village” were rated as very important. The aim “enjoy rural lifestyle” was also most highly rated (by this SFH type) in Romania. The aim “have time for leisure activities” is very important for the respondents, which is in line

30 No table with results is given in Annex 3 for the aim “provide for the next generation”.

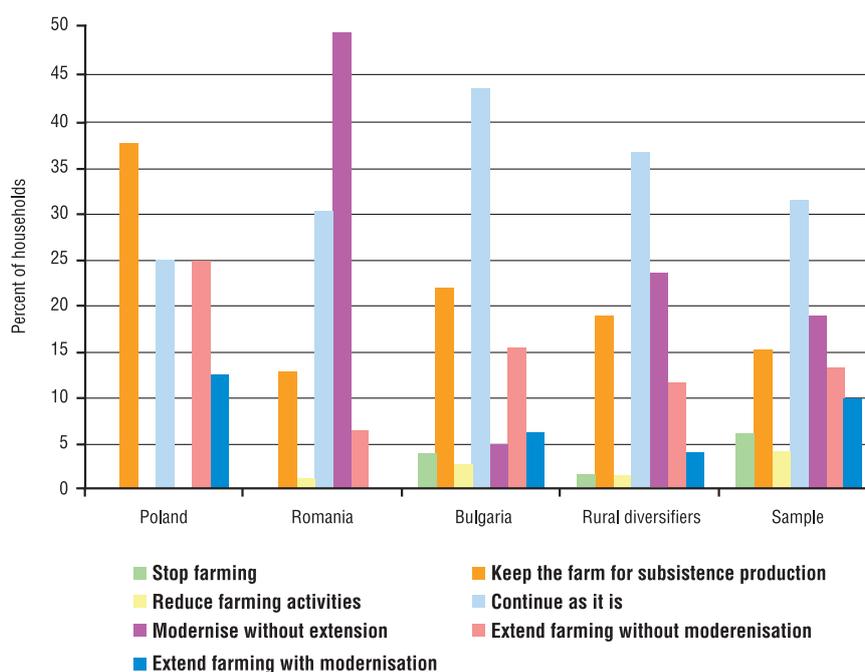
31 This might seem inconsistent with the rating that Polish rural diversifiers gave for the objective “maximise non-farm income”, but it should be recalled that the objectives were evaluated against each other, whereas each aim was rated independently of the rating of the other aims.

32 Scenarios that require farm investments are: (i) modernisation of the farm without extensions, (ii) farm extension without modernisation, and (iii) farm extension with modernisation.

33 Households that have already received the payments are not eligible for the measure in the future.

34 At first glance, this contradicts the rating given to the objective “maximise non-farm income”. Nevertheless, it could be rational, since rural diversifiers already earn a substantial share of their net household income off the farm. Therefore, it may be of no interest to them to expand it further (low importance of the objective), whilst recognising the need to continue with their existing level of non-farming income activities (high rating of the aim).

Figure 11: Rural diversifiers: future intentions for the farm, by country



Source: Own calculation with data from project survey.

with their answer for the objective “minimise agricultural labour input”.

Future intentions for the farm

Nearly half the households (49%, Figure 11) plan to modernise their farm but do not intend to extend it. Considering all households that mentioned an option requiring farm investments, 56% of households intend to modernise or extend their farming activities. Almost one third of the households (30%) plan to operate their farm on the current level, while scenarios that imply a reduction in farming activity³⁵ were chosen by only 14% of the households.

Transitional semi-subsistence support

At the time the interviews were undertaken, the transitional semi-subsistence measure was completely unknown to the households. No household wished to apply for the measure.³⁶

³⁵ Scenarios that imply farming activity will be reduced are: (i) stop farming, (ii) keep the farm but only on a subsistence level, and (iii) reduce farming activities.

³⁶ At the time of the interviews, the Rural Development programme for Romania was still under discussion with the European Commission, and the outcome could not

Bulgarian rural diversifiers (N=79)

Objectives and aims

Bulgarian rural diversifiers gave the objective “maximise annual cash balance” 14 points, which is more than the rating given to this aim by rural diversifiers in the other two countries.

Bulgarian rural diversifiers rated the aim “diversify income sources” as important, but their rating is below that in Romania. Two aims reflecting philosophy of life, i.e. “be respected in the village” and “be rooted to the soil”, were considered very important, and the first of these was valued much more highly than by rural diversifiers in the other two countries.

Future intentions for the farm

More than two fifths (44%, Figure 11) of the households do not intend to make any changes in their farming activities. The other households

be predicted, causing reluctant answers to questions concerning future subsidies. It can be assumed that application behaviour will differ from the survey results when the transitional semi-subsistence measure is in place.

are equally distributed among the scenarios that require farm investments (27%) and those that imply reduced farming activities (28%).

Transitional semi-subsistence support

A quarter of the households (24%) were aware of the measure. After receiving information about it, around two fifths of households (38%) thought they would apply for it in the future.

6.1.2 Rural Pensioners

Please note that, within this sub-group, the numbers in Poland and Romania are very small.

Polish rural pensioners (N=10)

Objectives and aims

For Polish rural pensioners, the aims “conserve the heritage”, “keep up the family’s traditions”, and “avoid taking advances” are clearly less important than for rural pensioners elsewhere.

Future intentions for the farm

Thirty percent of the households intend to reduce their farming activities to subsistence level and another 30% will continue them as they are (Figure 12). Scenarios that imply reduced farming activities were chosen by 50% of the households, whereas only 20% of households intend to expand the farm (with or without modernisation).

Transitional semi-subsistence support

Nearly all the Polish rural pensioners (90%) were aware of the transitional semi-subsistence measure. The question concerning future application was valid for only one household, which said it was not interested in this subsidy.

Romanian rural pensioners (N=12)

Objectives and aims

Romanian rural pensioners gave the objective “minimise agricultural labour input” 35 points, which is the highest among the three countries.

They also rated the aim “avoid taking advances” as being very important for them.

Future intentions for the farm:

More than two fifths (42%, Figure 12) of the households intend to modernise their farm but they do not plan to extend it. In total, 50% of households intend either to extend or to modernise their farm. One quarter of households plan to continue their farming activities as they are, and another quarter chose an option involving reduced farming activities.

Transitional semi-subsistence support

No household was initially aware of the measure and no household planned to apply for it.

Bulgarian rural pensioners (N=61)

Objectives and aims

Bulgarian rural pensioners gave the objective “maximise annual cash balance” more importance than did rural pensioners elsewhere, whereas the objective “minimise agricultural labour input” was rated lower. Two aims that reflect conservative behaviour, namely “keep up the family’s tradition” and “conserve the heritage”, are very important for Bulgarian pensioners, more so than for pensioners elsewhere. The aim “avoid taking advances” is also very important.

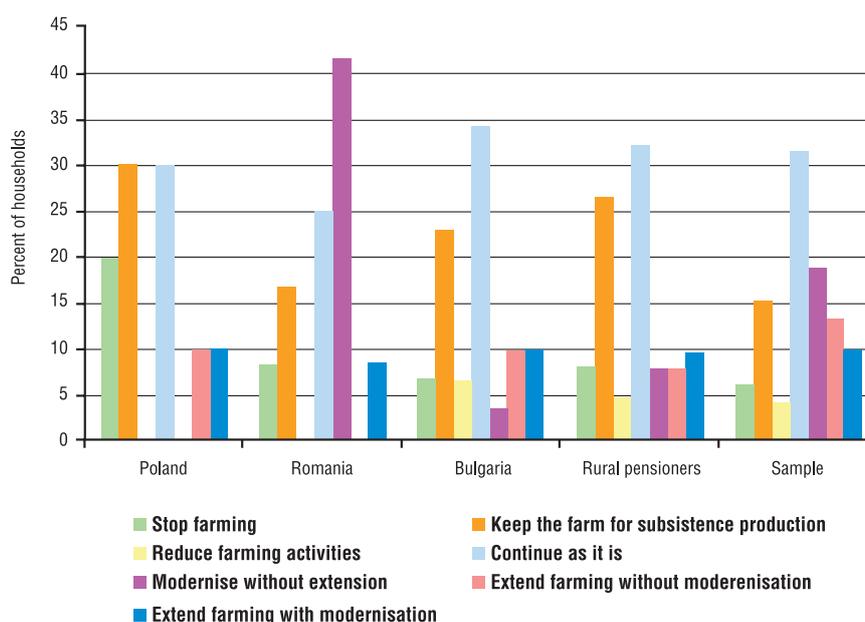
Future intentions for the farm

The most preferred option for the farm, as expressed by 34% of households, is to continue with activity as it is, but reducing farming activity to subsistence level is chosen only slightly less often (28%, Figure 12). Two fifths of households intend to reduce their farming activities, whereas only 23% of households plan to extend or modernise their farms.

Transitional semi-subsistence support

Only a quarter of households were aware of the measure. After receiving information about it, nearly half (48%) were interested in a future application.

Figure 12: Rural pensioners: future intentions for the farm, by country



Source: Own calculation with data from project survey.

6.1.3 Farmers

Polish farmers (N=103)

Objectives and aims

Farmers give more importance to the objective “maximise non-farm income” in Poland than in the other two countries. The objectives “maximise household income” and “maximise annual cash balance” received the lowest ranking of the three countries. Moreover, Polish farmers did not attach much importance to the objective “minimise agricultural labour input”.

Polish farmers also gave less importance to aims that indicate conservative behaviour than farmers in the other two countries, and they considered “conserve the heritage” to be more important than to “keep up the family’s traditions”. By contrast, the aims “provide children with a good/higher education” and “have time for leisure activities” are very important.

Future intentions for the farm

A remarkably high share of households (30%, Figure 13) plan to continue with their

farm at the current level. But taking together all options that require investments, almost half the households (48%) plan to invest in their farm. Only 22% of households intend to reduce their farming activities in future.

Transitional semi-subsistence support

Most of the Polish farmer households (96%) were familiar with the transitional semi-subsistence measure. Only four households still had the opportunity to apply for it in the future, and only two of them were interested in an application.

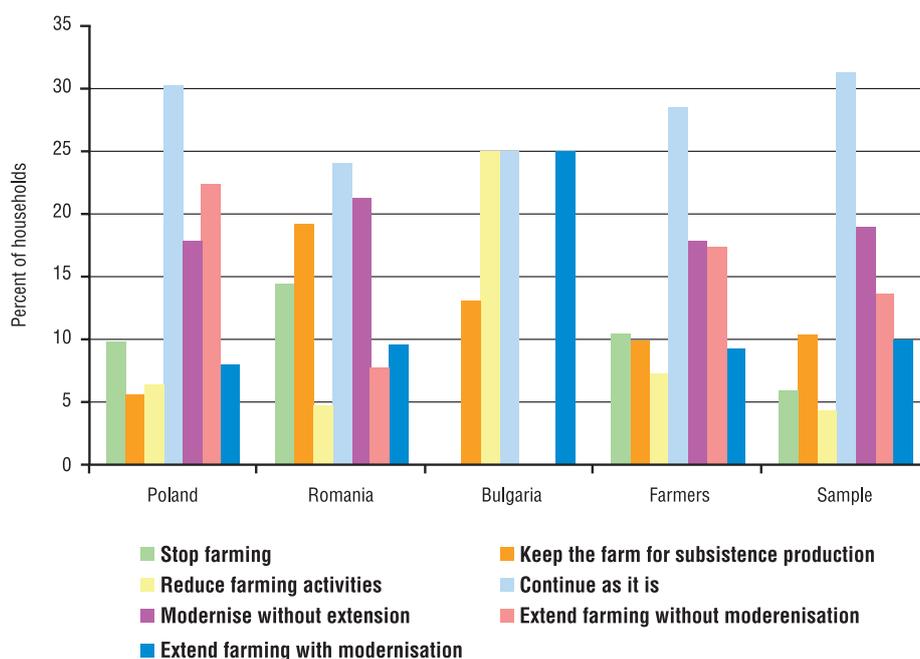
Romanian farmers (N=42)

Objectives and aims

Farmers in Romania gave the objective “maximise agricultural net production” the lowest ranking of the three countries, and in line with this, they gave the objective “minimise agricultural labour input” the most importance (although still not high). Of high importance is also the objective “maximise household income”.

There are a number of aims that Romanian farmers see as very important. In particular, these

Figure 13: Farmers: future intentions for the farm, by country



Source: Own calculation with data from project survey.

are aims that indicate a conservative philosophy of life like “enjoy rural lifestyle”, “be rooted to the soil”, “conserve the heritage”, and “avoid taking advances”. However, aims that reflect awareness of necessary changes like “diversify income sources” and “provide children with a good/higher education” are also very important to them. Furthermore, Romanian farmers also rated the aim “have time for leisure activities” as very important.

Future intentions for the farm

The most preferred future options are to continue with activity as it is (24%, Figure 13), to modernise the farm without extensions (21%), and to reduce farming activities to subsistence level. There is no clear-cut tendency. Furthermore, taking together all intentions that imply reducing farming activities, or those that imply investing in the farm, it is clear that Romanian farmers cannot be considered a homogeneous group. Roughly two fifths of the households (38%) intend to reduce their farming activities, while another two fifths (38%) plan farm investments.

Transitional semi-subsistence support

The measure was unknown in all households sampled, and no household wished to apply.

Bulgarian farmers (N=8)

Objectives and aims

Bulgarian farmers gave the objective “maximise agricultural net production” the highest rating (30 points), and the objective “maximise non-farm income” the lowest rating (7.5 points), among farmers in the three countries. Consistent with the high importance given to maximising agricultural net production, the objective “minimise agricultural labour input” was rated low. The other two objectives “maximise household income” (24 points) and “maximise annual cash balance” (15 points) were ranked high in terms of importance.

Bulgarian farmers gave the lowest ratings amongst farmers in the three countries to the aims “have time for leisure activities”, “be rooted to the soil” and “enjoy rural life”. On the other hand, the aim “conserve the heritage” is very important for them. They differed sharply from farmers in the other

two countries in attaching low importance to the aim “provide children with a good/higher education”. However, there are very few respondents in this sub-category, and these views may not be representative.

Future intentions for the farm

In each case, two households plan to reduce their farming activities, to continue with their farm at the current level, and to extend their farm by modernisation. Since there are only eight Bulgarian farmers in the sample, care should be taken when interpreting these figures.

Transitional semi-subsistence support

Half the households (50%) were aware of the transitional semi-subsistence measure. After becoming fully informed about it, only half (50%) showed an interest in applying.

6.1.4 Rural Newcomers

Polish rural newcomers (N=37)

Objectives and aims

Among all rural newcomers, the objective “maximise non-farm income” received the highest

rating (40 points) in Poland. At the same time, rural newcomers in Poland gave much lower importance to the objectives “maximise household income” (10 points), “maximise annual cash balance” (5 points), and “minimise agricultural labour input” (5 points) than elsewhere.

The aims “enjoy rural lifestyle” and “avoid taking advances” are also considered important, but not as important as for Romanian rural newcomers. Another very important aim is to “have time for leisure activities”.

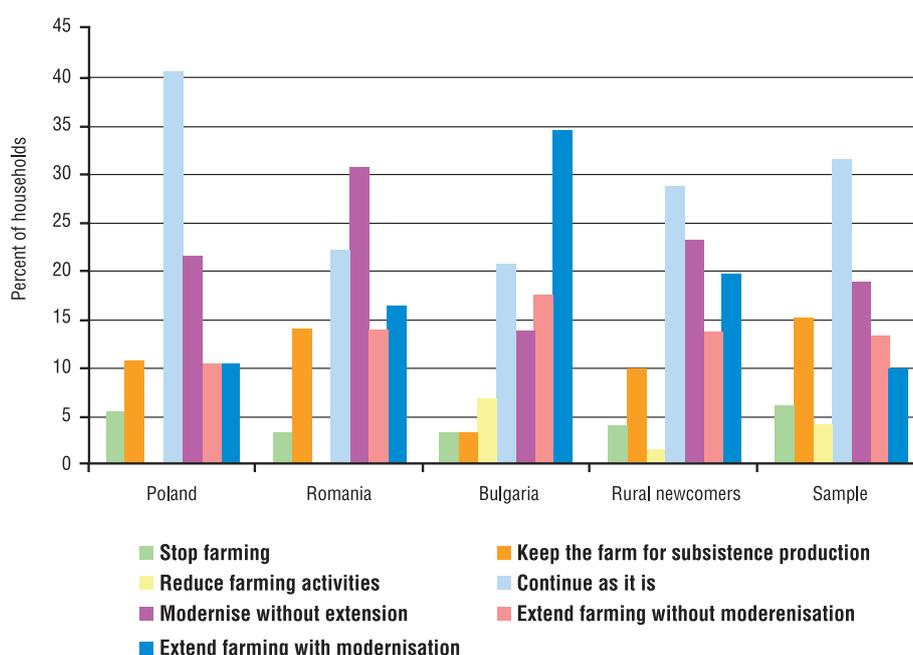
Future intentions for the farm

The most preferred scenario by households is to continue their farming activity as it is. Two fifths (41%, Figure 14) of households chose this option. But pooling all households that plan to invest in their farm shows that a comparable share of households (43%) will extend or modernise their farms. Only 16% of households are contemplating future reductions of farming activities.

Transitional semi-subsistence support

Most of the households (92%) knew about the measure. Only three households

■ Figure 14: Rural newcomers: future intentions for the farm, by country



Source: Own calculation with data from project survey.

were still eligible for the measure, and two of them plan to apply.

Romanian rural newcomers (N=36)

Objectives and aims

The objectives “maximise household income” (22.5 points) and “minimise agricultural labour input” (20 points) were rated considerably more important by Romanian newcomers than by their Polish and Bulgarian counterparts. Also, the objective “maximise annual cash balance” was considered to have a high importance (17.5 points).

The aims “diversify income sources”, “enjoy rural lifestyle”, “avoid taking advances”, and “have time for leisure activities” were also considered to be very important. Among all rural newcomers, the first three aims are of highest importance in Romania.

Future intentions for the farm

The most preferred option (31%, Figure 14) for the future is to modernise the farm without expansion. Taking all scenarios with farm investments into account shows that three fifths of the households (61%) plan to extend or modernise their farms, whereas only 17% of households will reduce their farming activities. No changes are planned by one fifth of households (22%).

Transitional semi-subsistence support

No household mentioned knowing the measure, and no household plans to apply.

Bulgarian rural newcomers (N=30)

Objectives and aims

Bulgarian rural newcomers rated the objective “maximise non-farm income” at only 10.5 points. This is by far the lowest rating among this group in the three survey countries. The objective “maximise annual cash balance” was given 15 points, indicating that this objective is of high importance for them.

Compared to the Polish and Romanian rural newcomers, Bulgarian rural newcomers attach low importance to the aims “diversify income sources” and “have time for leisure activities”. The first aim was rated as neither important nor unimportant. This is consistent with this group’s answer for the objective “maximise non-farm income”. The second aim is nevertheless important for Bulgarian rural newcomers. The two aims “enjoy rural lifestyle” and “avoid taking advances”, although important for Bulgarian rural newcomers, are less important than for their counterparts in Romania.

Future intentions for the farm

About a third of households (35%, Figure 14) intend to extend *and* modernise their farm. Pooling all households who plan to extend and/or modernise their farm, it emerges that the majority of households (66%) plan to invest in the farm. One fifth of the households (21%) will operate the farm at the current level and only 14% intend to reduce their farming activities.

Transitional semi-subsistence support

The majority of households (72%) were not aware of the measure, but after being informed nearly all households (83%) intended to apply in future.

6.2 Viability

Household viability is assessed according to the four viability indicators: (i) viability considering net earned income, (ii) viability considering net earned income plus subsidies received, (iii) viability considering net earned income plus received social security benefits, and (iv) viability considering net household income.

In what follows, first median viability is compared according to different viability measures across countries, within each SFH type. Then the shares of viable households are compared.

6.2.1 Rural Diversifiers

Polish rural diversifiers (N=8)

Polish rural diversifiers are more viable than their counterpart households in Romania and Bulgaria. This is reflected by their median viability (considering net earned income and subsidies received) of 1.35, which rises to 1.63 when considering net household income. Even when viability is assessed considering only net earned income, half of the households are viable. Social security benefits received increase the percentage of viable households to nearly two thirds, and subsidies have a stronger impact. They increase the share of viable households to three quarters of the sample. Taking all income components together does not further increase the share (75%) of viable households (Table 30). It should be borne in mind that this sub-group is very small.

Romanian rural diversifiers (N=63)

The viability of Romanian rural diversifiers is more similar to that of their Bulgarian counterparts than to that in Poland. Considering only net earned income, about one in five households are viable. Social security benefits received increase the share of viable households to about one in three. Subsidies have a smaller effect, raising the share of viable households to one in four. When all income components are considered, the share of viable households is about two in five (41.3%) (Table 30).

Bulgarian rural diversifiers (N=79)

Rural diversifiers are the least viable in Bulgaria. Their median viability is 0.60 when only net earned income is considered, and increases to only 0.83 when the total net household income is taken into account. The share of viable households is similar for net earned income (20.3%) and net earned income plus received subsidies (20.3%). Social security benefits received have quite a strong impact on the share of viable households, raising it to one in three, which is also the same share of viable households (34.2%) when all household income sources are considered (Table 30).

6.2.2 Rural Pensioners

Polish rural pensioners (N=10)

Polish rural pensioners are worse off compared to their counterparts in Romania and Bulgaria. Their median viability (considering net earned income only) is -0.03, which indicates negative net earned income. Social security payments increase their median viability to 0.33 and raise the share of viable households to one in ten. Subsidies received do not make any of the households viable (Table 31). When all income sources are considered, still only one in five households (20%) are viable (Table 31). The number of observations in this sub-group is small.

Table 30: Number and percentage of viable rural diversifiers

	Poland		Romania		Bulgaria		Sample	
	N	%	N	%	N	%	N	%
Viability considering net earned income	4	50.0	14	22.2	16	20.3	34	22.7
Viability considering net earned income and subsidies received	6	75.0	16	25.4	16	20.3	38	25.3
Viability considering net earned income and received social security payments	5	62.5	20	31.7	27	34.2	52	34.7
Viability considering household net income	6	75.0	26	41.3	27	34.2	59	39.3

Source: Own calculation with data from project survey.

Table 31: Number and percentage of viable rural pensioners

	Poland		Romania		Bulgaria		Sample	
	N	%	N	%	N	%	N	%
Viability considering net earned income	0	0.0	1	8.3	0	0.0	1	1.2
Viability considering net earned income and subsidies received	0	0.0	2	16.7	0	0.0	2	2.4
Viability considering net earned income and received social security payments	1	10.0	5	41.7	11	18.0	17	20.5
Viability considering household net income	2	20.0	5	41.7	12	19.7	19	22.9

Source: Own calculation with data from project survey.

Romanian rural pensioners (N=12)

Although rural pensioners are more viable in Romania relative to the other two survey countries, most of them are still non-viable. Their median viability considering only net earned income is 0.27. Payments from the social security system have a remarkable effect, raising the median viability measure to 0.78. By contrast, the effect of subsidies on median viability is quite low, increasing it to only 0.32. Regarding the share of viable households, social security payments increase the share of viable households from less than one in ten (for net earned income only) to two in five, whereas the share of viable households increases far less when subsidies are combined with net earned income. Considering all income components, the share of viable households remains at about two in five (41.7%) (Table 31). The number of observations in this sub-group is small.

Bulgarian rural pensioners (N=61)

The viability of Bulgarian rural pensioners is similar to that of those in Poland (although based on a larger sub-sample). No household is viable when only net earned income is considered, and adding subsidies does not make any household viable. Receipt of social security benefits, however, has an effect: nearly one in five households is viable when these payments are included. Considering all sources of household

income, only about one in five households (19.7%) is viable (Table 31).

6.2.3 Farmers

Polish farmers (N=103)

Within the SFH type “farmers”, those in Poland are the most viable. When income consisting of net earned income and subsidies is considered, they have the highest median viability (0.96) across the three countries. Considering household net income, median viability reaches 1.22³⁷. Nearly one in five households (18.4%) are viable with respect to net earned income alone. Received social security payments raises this share to one in three, but the strongest effect is caused by subsidies. More than a quarter of households are raised from non-viability to viability when subsidies are added in with net earned income. When all income sources are considered, about two thirds (64.1%) of Polish farmer SFHs are viable (Table 32).

Romanian farmers (N=42)

Romanian farmers have the lowest viability compared with farmers in Poland and Bulgaria. Their median viability considering net earned

³⁷ The threshold of 1.0 for the median distinguishes between situations where less than half the households are viable (median < 1) and those where more than half are viable (median > 1).

Table 32: Number and percentage of viable farmers

	Poland		Romania		Bulgaria		Sample	
	N	%	N	%	N	%	N	%
Viability considering net earned income	19	18.4	4	9.5	2	25.0	25	16.3
Viability considering net earned income and subsidies received	48	46.6	6	14.3	2	25.0	56	36.6
Viability considering net earned income and received social security payments	33	32.0	10	23.8	4	50.0	47	30.7
Viability considering household net income	66	64.1	10	23.8	5	62.5	81	52.9

Source: Own calculation with data from project survey.

income and subsidies received is 0.42 and rises to only 0.61 when all income sources are taken into account. With respect to net earned income, only one in ten households are viable. Subsidies raise the share of viable households somewhat, but the strongest effect comes from social security payments, which when added in with net earned income raise the share of viable households to about one in four (23.8%). Taking all income components into account, does not further raise the share of viable households (Table 32).

Bulgarian farmers (N=8)

One quarter of Bulgarian farmers are viable when taking net earned income into account. Received subsidies do not raise this share, whereas social security payments have a strong impact on viability. Half the households become viable when social security payments are added in with net earned income. Considering all

income sources, nearly two thirds (62.5%) of the households are viable (Table 32). These results are based on a small number of households.

6.2.4 Rural Newcomers

Polish rural newcomers (N=37)

Polish rural newcomers are more viable than households of the same SFH type in Romania and Bulgaria. They have the highest median viability (0.72) with respect to net earned income plus subsidies, and also with respect to total net household income (0.87). Nevertheless, most of these households are not viable. With respect to net earned income, just one in twenty households are viable. The receipt of social security payments raises the share of viable households one in five. When subsidies are added to net earned income, the viable share improves to just over one in four households. Taking all income sources into

Table 33: Number and percentage of viable rural newcomers

	Poland		Romania		Bulgaria		Sample	
	N	%	N	%	N	%	N	%
Viability considering net earned income	2	5.4	2	5.6	5	16.7	9	8.7
Viability considering net earned income and subsidies received	10	27.0	3	8.3	5	16.7	18	17.5
Viability considering net earned income and received social security payments	8	21.6	5	13.9	7	23.3	20	19.4
Viability considering household net income	16	43.2	6	16.7	7	23.3	29	28.2

Source: Own calculation with data from project survey.

account, more than two fifths of households (43.2%) are viable (Table 33).

Romanian rural newcomers (N=36)

Romanian rural newcomers are worse off than their Polish counterparts. The same low share of these households as observed in Poland is viable when considering net earned income alone. However, the impact of subsidies is particularly small, and even social security benefits do not help the situation very much. Considering all income sources, less than one household in five (16.7%) is viable (Table 33).

Bulgarian rural newcomers (N=30)

Bulgarian rural newcomers have the lowest median viability (0.28) when considering net earned income plus subsidies received, which rises to 0.51 when all income sources are taken into account. Taking only net earned income into account, just one in six households are viable, and subsidies do not allow any more households to attain viability. However, the receipt of social security payments increases the share of viable households to nearly one in four (23.3%). Taking all income sources into account does not raise the share of viable households further (Table 33).

6.3 Summary

The viability measures show that some SFHs are significantly better off than others in certain countries, but that in general a large proportion

are in a precarious position when trying to cover modest household expenses from low total household income. Whereas many farm households, especially in the pensioner group, do not plan to make any changes, there are also many other households that envisage changing their circumstances by investing and expanding their farms, as well as investing in the education of their children. Thus, the overall situation has a dynamic element, although maintaining the *status quo* is a common position. Only a few SFHs plan to quit farming altogether, which in part may be explained by households' strong attachment to their way of life and culture. Finally, for many households, subsidies and social security payments are important contributors to their economic welfare.

The frequently adopted strategies of (a) leaving farming, (b) seeking other employment opportunities, (c) maintaining the farm as it is, or (d) expanding it with or without investment, and (f) retiring, were adopted as scenarios for the following exercise simulating the potential sustainability of SFHs. The country-by-country results reported in this chapter support the conclusion each SFH type would not be well represented in the simulation exercise by just one 'typical' household, because this approach would not allow country-specific responses to be explored. Therefore, three households per SFH type are simulated, i.e. one household for each SFH type per country. However, the caveat is repeated that the inter-country differences identified in this chapter, and those emerging from the simulations, are in some cases conditional on information coming from very small samples.

Part 4: Description of the Policy Simulation Model and Results of the Decision Scenarios for Representative SFHs

■ 7 Modelling Policy Measures for SFHs Using Linear Programming

Amongst the various methodologies available for policy analysis, it was agreed among all project partners to use a multi-objective linear programming (MOLP) approach that takes SFH characteristics explicitly into account.

Section 7.1 gives a brief methodological overview of the linear programming (LP) model in the S-FARM study. The procedures for selecting SFHs and SFH characteristics for modelling are outlined in Section 7.2. The structure of the MOLP model and the base data for simulation are summarised in Sections 7.4 and 7.3, respectively. The chapter concludes with simulation assumptions in Section 7.5.

7.1 Brief Overview of the Linear Programming Methodology

LP approaches optimise an objective function subject to constraints, where the decision variables in the objective function represent levels of activities in a decision problem. The solution gives the optimal levels of decision variables, which maximise or minimise the objective function. An example of a common application of this methodology occurs in operational management, where the goal is to maximise the rate of return on an investment portfolio by choosing how much to invest in a range of securities.

In general, a LP problem can be formulated as follows:

Optimise the objective function *max (min)*

$$Z = c_1x_1 + c_2x_2 + \dots + c_nx_n$$

subject to the functional constraints

$$a_{11}x_1 + a_{12}x_2 + \dots + a_{1n}x_n \leq b_1$$

$$a_{21}x_1 + a_{22}x_2 + \dots + a_{2n}x_n \leq b_2$$

$$a_{m1}x_1 + a_{m2}x_2 + \dots + a_{mn}x_n \leq b_m$$

and the non-negativity conditions.

$$x_1 \geq 0, \quad x_2 \geq 0, \quad \dots, \quad x_n \geq 0$$

The decision variables x_j represent the level of activity j ($j=1..n$). Instead of the less-than-or-equal-to inequality (\leq) in the functional constraints, greater-than-or-equal-to (\geq) or equal to ($=$) constraints are possible. The coefficients a_{ij} ($i=1..m, j=1..n$) show how much is used of the resource i for one unit of activity j . b_i stands for the total amount of resource i available for all activities. c_n is the effect of a one-unit increase in the level of activity j on Z , and Z is a measure of performance that is to be optimised, e.g. net agricultural production.

The programming model is called a *linear* programming model when all equations and inequalities are of linear form. Other possibilities are nonlinear programming models where at least one equation or inequality is of nonlinear form, integer programming models in which all x_j have integer values, or mixed integer programming models allowing for x_j some of which have integer values and some of which may be real numbers (Hillier and Lieberman 1995).

Programming models describe a problem in mathematical terms, hence transparently and concisely. They involve related cause-and-effect relationships and consider them simultaneously for the solution of a problem. There are, however, also disadvantages. Like all models, programming models are a simplified representation of reality, and the specification of the model has to find a good balance between manageability and complexity. Additionally, functional constraints require knowledge about the relationships between the level of activities and the use of various resources that sometimes are not available. This may result in the decision to omit these resources and by doing so to ignore important information.

Programming models have been used extensively in farm business management to optimise the production structure of single farms but they are also used for policy analyses. Ackrill *et al.* (2001) used a mixed integer programming model to simulate the outcome of the Agenda 2000 reform of the Common Agricultural Policy (CAP) in the EU on oilseed and cereal farmers in eastern England. Breen *et al.* (2005) projected the impact of decoupling subsidies from agricultural production on Irish farms with a LP model and compared their simulation results with answers from 1,030 farmers on a question about their future intentions. Buysse *et al.* (2007) used a positive mathematical programming model to measure the effect of EU sugar market reform on Belgian sugar beet farmers.

Farm programming models typically optimise only one objective function, usually farm profit. However, SFHs normally follow more than just one livelihood strategy. For example, aims like continuity of food availability or diversification of income sources are also relevant to decisions taken by SFHs. According to Braun and Lohlein (2003), modelling the transition process from subsistence to market-oriented production should not only take into account resource use but also risk aversion, preferences for special activities, and trade-offs between objectives. For example,

an SFH may want to keep a certain degree of self-sufficiency even at the cost of income losses.

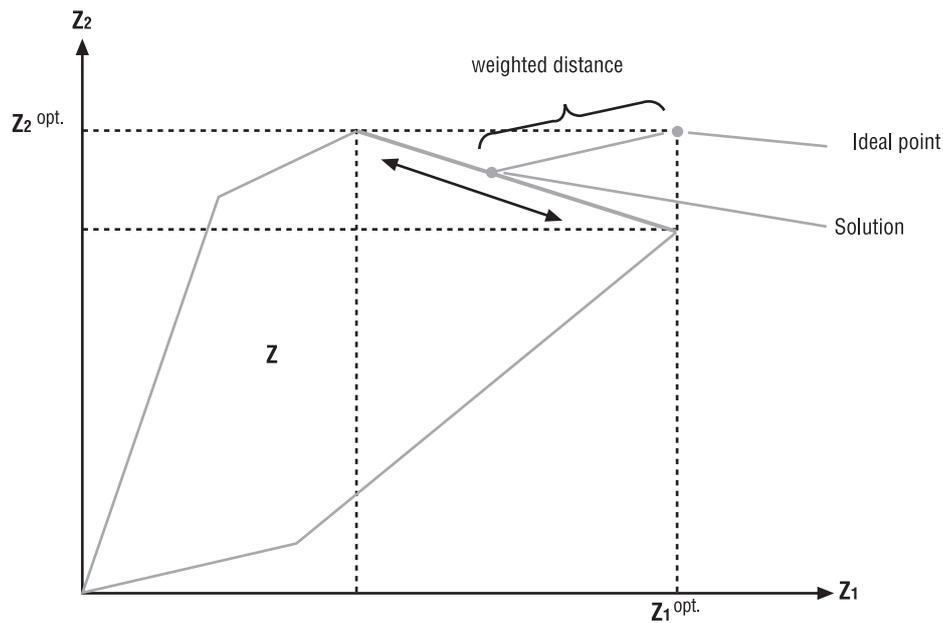
In this study, a multi-objective linear programming (MOLP) model is used to allow additional objectives, which may be relevant for SFHs, to be explicitly included in the optimisation. When applying MOLP, the user faces three problems. First, objectives and their relevance for SFHs have to be identified. Second, a mathematical expression for each objective has to be developed within the programming model's framework. Finally, the user has to select a technique that allows all objectives to be considered simultaneously within the model. When multiple objectives are considered in programming approaches, there is not just one optimal solution, as in general the objectives possess different exclusive optimal solutions. Therefore, a choice has to be made from the set of non-dominated³⁸ solutions by making assumptions about the preference structure of decision-makers or by eliciting preference information from decision-makers.

There exists a vast variety of methods for multiple criteria decision analysis (Figueira *et al.* 2005). Romero and Rehman (2003) discuss different methodological approaches for considering multiple objectives in agricultural decision models. One of the approaches discussed is compromise programming, which will be used in this study. In compromise programming, only subsets of the non-dominated set are considered, based on the relative importance of the objectives for decision-makers, which is estimated by weights.

To begin with, a utopian non-feasible ideal point is defined, which optimises all objective functions simultaneously. This point is calculated by simply combining the optimal solutions of the single objective functions within one

³⁸ A solution is called non-dominated if there is no other solution with a bigger value for at least one objective function, while the values for all other objective functions are greater or equal when all objectives are to be maximised.

Figure 15: Principle of compromise programming



vector. Secondly, assuming that non-dominated solutions that are closest to the ideal point would be preferred by decision-makers, the weighted distance to the ideal point is minimised. This results in a non-dominated solution with a minimal weighted distance to the ideal point. Figure 15 displays the underlying principle of compromise programming.

Figure 15 shows the set of feasible solutions (Z) of a programming problem with two objective functions (Z_1 and Z_2) in the objective space. The borders of this set are marked by lines. The subset of non-dominated solutions lies on the border, which is marked by a thick line and arrows indicating that a solution has to be found from this subset. In compromise programming this is the solution with the minimal weighted distance to the ideal point.

An advantage of compromise programming is that, under limited preference information, it results in solutions that better represent a possible choice of decision-makers than, for instance, scalarising techniques like the weighted sum approach, due to the underlying idea of

minimising the distance to the ideal point. Scalarising techniques are more appropriate for interactive decision-making support. Furthermore, in contrast to goal programming, this model calculates only non-dominated solutions and, unlike the weighted sum approach, it considers all possible solutions in the non-dominated set. However, it requires a considerable modelling effort and in multiple criteria decision analysis it is not possible to state an absolute advantage of one approach over others for a certain problem (see Romero and Rehman 2003, p. 75, for further discussion). Teufel (2007) used compromise programming for simulating the effects of various technological interventions on small-scale milk producers in Punjab **and in this study the approach** proved quite useful for simulating the behaviour of small-scale farms.

In order to consider particular aims and possible strategies of households for decision scenarios, the constraint method will be used. By setting lower or upper bounds, i.e. minimum or maximum levels, on certain model parameters, it is possible to consider aims in addition to the explicitly formulated objective functions. For the

aim and a possible scenario “diversify income sources”, e.g. lower bounds (minimum levels) on agricultural and non-farm income parameters could be set.

The following sections explain the model structure and the SFH objectives that are considered within the model. Additionally, the simulation assumptions are specified, as well as the analysed policy measures and the households’ strategies.

7.2 Selection of Representative SFHs for the Model

Our cluster analysis identified the following four SFH types:

- Rural non-farm oriented households (rural diversifiers, N=150),
- Rural pensioners and deprived households (rural pensioners, N=83),
- Large-scale semi-subsistence farm households (farmers, N=153), and
- Rural households with undeveloped potential (rural newcomers, N=103).

The effects of different policy measures was simulated for specific, real households³⁹ from the survey⁴⁰, so that each surveyed country is represented with one household per SFH type in the simulation. The selection procedure, as agreed among all project partners, included the following steps and principles:

The selected household ought to represent the SFH type in its most important features. Therefore, not all variables had the same importance for the selection. The most important features refer to those variables that were used

to identify the SFH types. In general, these were the following variables: shares of various income sources in household net income, share of own-consumption in agricultural output, and economic farm size. For example, if the SFH type is characterised by its high share of social security benefits in household net income, then it was very important that the selected household reaches the median value of the respective SFH type for this variable.

As it turned out, many households were close to the medians of the variables, but there was no household, for any SFH type, that was closest to the median of *all* variables. Therefore, the following procedure was used. First, those households were retained that were within 0.5 of the standardised median values for the most variables and especially for variables that describe the most important features of the SFH type. Second, from among these households, for each SFH type, those households were identified that were seen as a better “fit” because they were closest to the above-mentioned most important variables. These households were listed with their respective variable values and deviations from the median variable values.

The list resulting from step 2 was sent to the local experts as a basis for their selection of one household per SFH type for the modelling.

The experts assessed the listed households, considering the criteria described above and other additional relevant information. There were *pros* and *cons* associated with certain households; the choice was sometimes close and was based on the experience of the national experts. In other cases, the selection was straightforward, as the alternative households had certain characteristics that clearly excluded them from being selected. For example, a Bulgarian household specialised in raspberries and thus could not be considered typical for its SFH type.

³⁹ This is preferred to an artificially constructed “average” or “composite” household, on the grounds that it is more likely to be internally consistent.

⁴⁰ All parameters are calculated specifically for each simulated household. However, there are some exceptions, where country averages from the survey data are used, e.g. weights for objectives. These exceptions are mentioned in the respective parameter descriptions.

Annex 4 reports the variable values for the households selected for each country and SFH type⁴¹.

7.3 Structure of the S-FARM Model

A LP model that represents a semi-subsistence farm household was constructed in GAMS⁴² for the policy analysis. A farm household model consists of various income sources with their costs and labour use, and expenditure categories in order to assess the household's cash balance. In general, SFHs have limited resources in the form of land and physical assets. They usually have plentiful labour with low opportunity cost in non-farm work, especially at certain times of the year. However, farming activities usually contribute only part of household income. For example, for certain types of SFH, higher purchased input costs might erode the value of agriculture as compared to other income activities. Moreover, keeping up with the standard of living in other parts of society greatly increases the requirements for cash, especially when the state sector has ceased providing a wide range of services in line with the adoption of market principles. The option of no-change strategies for such households seems increasingly untenable. Therefore, the structure of the model is adapted to explore and find the most acceptable household choices from a variety of options, such as non-farm employment, the adoption of scale-neutral agricultural technology, amalgamation of land into bigger holdings, and self-employment in non-farm businesses.

The household model considers three income activities as decision variables (farming, self-employment, and wage employment), with their operational costs and labour inputs. The labour input can be satisfied by household and hired labour. The latter is assumed to be available in certain scenarios only, and is set equal to a constant parameter in such scenarios.

The following four objective functions are specified in the programme⁴³:

- Net agricultural production (to be maximised): This objective represents the household's preferences for agricultural production, due to aims like food security or tradition.
- Net non-farm income (to be maximised): This objective captures household preferences for expanding additional income sources or reducing dependency on farming.
- Household cash balance (to be maximised): This objective corresponds to the objective "maximise net household income", which is usually assumed in household models⁴⁴. The only difference is that household expenditure, including expenditure to repay loans and credit, are subtracted from the maximand. Furthermore, interest payments, as well as investment in the farm and in self-employment, are included in household expenditure when calculating the household annual cash balance.
- Agricultural labour use (to be minimised): This objective would be most relevant for households that seek to continue farming on a certain scale for reasons of tradition or food security, but which are looking for more income from other income sources.

The equations of the programme consist of the four objective functions, the equations of the matrix of constraints, and the right-hand side (RHS) of the constraints, e.g. the bounds on resource use. The equations in GAMS notation,

⁴³ After revising the formulae for paid labour expenditure, the objective "maximise net household income" became redundant with the objective "maximise household cash balance" because there are no additional decision variables in the equation. Therefore, the fifth objective, "maximise net household income", was dropped from the model.

⁴⁴ The variable "household cash balance" has the advantage of showing directly whether the household will be viable or not under the respective scenario.

⁴¹ The household selection was approved by IPTS in May 2008.

⁴² GAMS: General Algebraic Modeling System.

together with a list of the abbreviations used, are given in the Appendix at the end of this chapter.

7.4 Parametric Specification of the Household Models

Simulation models for individual households require the use of specific parameters and fixed values, like those representing household expenditure, incomes and labour capacities, which are integrated in the model as coefficients and capacity constraints. These values were calculated using data from the household survey and from statistical yearbooks, as explained below. The resulting values are given in Annex 5 and the questionnaire of the survey is available in Annex 8.

Turnover or gross income per unit of activity level was calculated from survey data. For farming, it is the sum over all products of quantities produced by the respective household, multiplied by the price and divided by the current cultivated agricultural area. For non-farm wage employment, it is the gross income (calculated from questions 6.8 and 6.16 in the structured questionnaire, Annex 8) divided by the labour input (hours per year). For self-employment, it is the country average⁴⁵ of the annual gross income (average calculated based on survey data, question 5.4 of questionnaire) divided by the country average of own and hired labour input for the activity (average calculated based on survey data, questions 5.6.b, 5.8, and 5.9 of questionnaire converted to hours per year).

Concerning non-farm wage employment, exceptions occurred for pensioner households in all three countries and for farmer households in Romania. As these households did not have non-farm employment in 2006, respective country averages of the income per unit activity level of

non-farm wage employment were calculated from the survey data and used as parameter values for these households.

The **allocation of labour time to income and non-income activities** is important for setting certain parameters, like labour input per unit activity for farming and labour capacity. It was necessary to assess the allocation of time spent for income and non-income activities. This was done by conducting telephone interviews with the households chosen for simulation, asking for information about their time allocation in 2006. In these interviews, the household was asked to specify for each household member the average number of hours per day spent on each activity in 2006. As the model requires data on labour inputs measured in terms of hours per year, the number of hours per year was calculated based on the figures from the telephone interviews.

Labour input per unit of activity level is 1.0 for self-employment and non-farm wage employment, as these activities have the same unit (hours) as labour input. For farming, it is calculated from survey data as total individual and hired labour input in 2006 (calculated from telephone interviews about labour distribution divided by the current cultivated area (ha).

Operational costs per unit of activity level were calculated from survey data. For farming, all expenditure resulting from agricultural production was divided by the available agricultural area of the farm. These production costs are expenditure for fertiliser (including manure), pesticides and other chemicals, seeds and planting materials, fuel, electricity, irrigation, maintenance and repair of machines and buildings, purchased feeding stuffs, purchased animals, machinery or custom services, veterinary costs including artificial insemination, taxes on land and buildings, transportation, agricultural insurances, payments of contribution for agricultural pensions as far as they are obligatory, and other expenses strongly connected to agricultural production (question 3.50 of questionnaire, but not considering land

⁴⁵ It was necessary to calculate a country average for this activity, as there are not many households within each country sample that are involved in self-employment activities.

rents, as a term for the land rent is calculated in the objective function “maximising household cash balance”).

For self-employed activities, the operational costs are expenditure on inputs, but also marketing costs. Transport costs were also involved (question 5.7 of questionnaire). Again, for this activity, the average country figures were used for calculating the operational costs per unit of activity level.

For wage employment, not only travelling expenses but also costs of work clothing and equipment for work were considered (questions 6.9 and 6.17 of questionnaire). Total cost of all non-farm income activities was divided by labour input⁴⁶ (own and hired labour, calculated as explained under “allocation of labour time to income and non-income activities”).

Concerning the wage employment activity, exceptions were made for all pensioners’ and the Romanian farmers’ households, as these households did not have dependent employment in 2006. Respective country averages of the costs per unit activity level of dependent employment were calculated from survey data and used as parameter values for these households. In addition, there was no survey data about costs of the farming activity for the selected Romanian rural newcomer household. Therefore, the average costs per ha of all Romanian rural newcomers were calculated and set as a parameter for the Romanian rural newcomer household selected for the simulations.

The **value of own-consumption of agricultural output** was calculated from survey data. It is the sum over all agricultural products of the quantities consumed by the household, multiplied by the respective price of the product.

⁴⁶ Country average of labour input for self-employment (questions 5.6.b, 5.8, and 5.9 of questionnaire converted into hours per year).

Cultivated land in 2006 is the land that the household cultivated in 2006 (questions 3.5.e and 3.6.e from questionnaire).

Other (non-earned) income. In addition to earned income from farming, self-employment, and wage employment, households also received income in 2006 in the form of non-agricultural subsidies⁴⁷ (sum of all subsidies from Section 4 of the questionnaire that the household received in 2006 that are not directly related to agricultural production, i.e. development and diversification of economic activities, renovation and development of villages, and development and improvement of rural infrastructure), pensions (old age pensions and pensions for veterans or disabled, etc., questions 7.14.a and 7.14.b), social security benefits (unemployment benefits, job search related programmes, social assistance payments, child benefits, and other benefits, questions 7.14.c to 7.14.g), remittances from family members or relatives (questions 7.12.a and 7.13.a), and other income (income from financial assets, income from partnerships, revenue from lotteries, rent from real estate assets, revenues from renting out land, and other revenues, question 7.17).

Costs of one hour of paid labour were taken from national statistical yearbooks, as there were not many households employing labour in the sample. As the figures for wages in agriculture from the national statistical yearbooks are based on national averages, they appear to be too high, considering the average income from self-employment from survey data and considering the fact that wages for simple jobs on small farms in rural areas might be below the national average. Therefore, the figures from the statistical yearbook were multiplied by 0.6, implying 60% of the national average as basis for labour costs in the simulation model.

⁴⁷ Agricultural subsidies are subject to policy scenarios and formulated as a separate model parameter.

Household expenditure covers eight categories of household expenditure, i.e. energy, food, transport, farm investments, investments into family business, education, support of other people, and other expenditure. They were calculated from the answers to questions 8.1, 8.3 to 8.8 and 8.12. The figure for household expenditures on food was calculated as 60% of the average expenditure on food according to the respective national statistical yearbooks⁴⁸.

7.5 Simulation Assumptions

Simulation results are conditioned by the simulation assumptions, i.e. the matrix of simulation parameters and the scenarios. The simulation parameters represent future developments of, for example, paid labour costs. Setting these parameters is not an easy task. In addition, simulation parameters are modified according to assumptions made for the calculated decision scenarios. Typically, the scenarios are given by the policy evaluator or decision maker.

Section 7.5.1 describes the scenarios and the assumptions made about scenario-specific simulation parameters. Section 7.5.2 explains according to which considerations the simulation parameters were set and which secondary data sources were used. Section 7.5.3 describes the simulation parameters, which are specific for each simulated household.

The matrices with the simulation parameters were agreed with the national experts in the project.

7.5.1 Scenarios for Simulation

Each scenario was simulated for one actual household per SFH type per country. Altogether twelve households were simulated. Each scenario corresponds to a different SFHs' development

strategy, defined in terms of the household's choice of a particular policy measure or set of measures. These scenarios, given in Table 34, reflect various alternative strategies on which a household could embark. The following five policy measures were combined for the scenarios:

- Single area payment scheme (SAPS),
- Transitional semi-subsistence support (TSS),
- Farm investment support for the modernisation of agricultural holdings,
- Support for diversification into non-agricultural activities, and
- Early retirement support.

In the simulations, it was assumed that all these measures are available for all households in each country.

A **baseline scenario** was calculated for each SFH type in each country. The baseline scenario is understood as the situation in 2016, when direct payments are fully implemented (i.e. to 100% of the agreed level) in all three countries but no rural development measures are applied. Hence, the baseline scenario can be interpreted as the strategy "continue as at present". The decision scenario **farm development** supposes that the household will invest in farming activities and receives support from the relevant policy measures. In the decision scenario **start self-employment**, it is assumed that the household starts a self-employed activity other than farming, receiving support from the respective policy measures. The decision scenario **farm development and start self-employment** assumes that the household invests in farming *and* diversifies into self-employed activities. All assumptions of both scenarios "farm development" and "start self-employment" are adopted. The decision scenario **stop agriculture** assumes that the farm operator stops farming activities and receives the relevant payments from the early retirement scheme. In addition, all decision scenarios that do not imply giving up farming activities are calculated in two variants: (i) with and (ii) without transitional semi-subsistence support.

⁴⁸ There seemed to be an overestimation of food expenditure for some households in the survey data. Therefore, figures based on national averages were used in the simulations.

Table 34: Simulated decision scenarios

Scenarios	Policy measures				
	SAPS	Semi-subsistence support	Farm investment support	Diversification support	Early retirement
Baseline (base)	X				
Farm development with semi-subsistence support (farm+tss)	X	x	x		
Farm development without semi-subsistence support (farm)	X		x		
Start self-employment with semi-subsistence support (self+tss)	x	x		x	
Start self-employment without semi-subsistence support (self)	x			x	
Farm development and start self-employment with semi-subsistence support (farm+self+tss)	x	x	x	x	
Farm development and start self-employment without semi-subsistence support (farm+self)	x		x	x	
Stop agriculture (retire)					x

Source: Own table.

A comparison of the results of the decision scenarios involving the choice of one or more adjustment measure with those of the baseline shows what the consequences would be if the SFH in question opted for these measures or combinations of measures, and what impact the chosen strategies would have on the development of that SFH. Furthermore, the comparison reveals which decision strategy would be the most beneficial option for the household type in the future.

The various decision scenarios are implemented in the model by setting specific bounds for activities⁴⁹ or specific values for parameters corresponding to these scenarios. In Table 35 these bounds and parameters values are

summarised, and a more detailed description is given in Section 7.5.2.

7.5.2 Simulation Parameters for Countries and Scenarios⁵⁰

In order to interpret the baseline scenario as the situation in 2016, assumptions about the future development of certain model parameters, like costs, incomes, and household expenditure, had to be made. In addition, parameters were also modified according to scenario-specific assumptions. These country and scenario-specific parameters are described in the following. The respective figures are available in Annex 5.

49 Scenario-specific maximum or minimum activity levels

50 The setting of various simulation parameters described in this chapter (such as income growth from farming, return on investments, and the multiplier of 0.8 for farm investment scenarios) is based on expert assessments.

Table 35: Simulation parameters in decision scenarios

Scenario	Simulation assumptions for implied strategy	Simulation assumptions for respective policy measure
Baseline	– No scenario specific assumptions	– No rural development measures applied
Farm development	<ul style="list-style-type: none"> – Lump-sum return from investment (1,500 EUR) + capital costs – Assuming changes in production structure to more crop production: Gross agricultural income, costs and labour input per ha multiplied by 0.8 – Possibility to rent in additional land: increased upper bound for farming (maximum twice the level of 2006) + costs per ha rented land – Lower bound for farming activity (measured as minimum cultivated area) set to 2006 level – 900 hours paid labour (farming activity) 	– Capital costs reduced by policy support: measure covers 50% of the investment in all countries
Start self-employment	<ul style="list-style-type: none"> – Labour capacity (upper bound) for self-employment only available in respective scenarios – Lower bound for own labour input to self-employment set to 900 hours – 900 hours paid labour (self-employed activity) – Capital costs for investment added 	– Capital costs reduced by policy support: in PL measure covers 50% of the investment, in BG and RO measure covers 70% of the investment
Transitional semi-subsistence support	– Lower bound for farming activity (measured in minimum cultivated area) set to 2006 level	– Lump-sum return of 100 EUR from investing the received support
Stop agriculture (early retirement)	– Upper bound for farming activity (measured in maximum cultivated area) set to zero	– Annual early retirement payment added to household income (4,616 EUR in PL, 2,630 EUR in BG and RO)

Note: The assumptions are described in more detail in chapter 7.5.2– this table gives a summarised overview.

Source: Own table.

Allocation of labour time to income and non-income activities: It was assumed that the demographic structure of the various SFH types in 2016 is the same as that observed in 2006. Therefore, the allocation of time over income and non-income activities in 2006, as stated in the telephone interviews, was assumed to be stable up to year 2016.

Turnover or gross income per unit of activity. For non-farming activities, the growth of gross income per unit activity was projected by taking base year data and increasing them by the real GDP growth as forecast by FAPRI⁵¹ (2008) for each surveyed country as given in Table 36. The figures used assumed for cumulative growth between 2006 and 2016 are 51.0% for Poland, 59.5% for Romania, and 53.7% for Bulgaria.

For farming activities, setting a growth trend for gross income per ha was not easy. Because of the developments in agricultural product prices in 2007, data for 2006 could no longer be considered a reliable basis for any assumptions about future developments. Therefore, it was crucial for the modelling results to define a reliable figure for farming. This called for an expert knowledge-based approach and IAMO asked all partners to estimate future developments in their countries. Based on a discussion with national experts and considering the trend in product prices, a general increase of agricultural gross income per ha of 150% from 2006 to 2016 was assumed, considering the rapid price increase from 2006 to 2007⁵². In addition, an increase of

51 FAPRI: Food and Agricultural Policy Research Institute.

52 The Bulgarian expert assumed a gross income growth from farming of 31.2%. However, all other experts agreed with a growth of 150% due to the price increase from 2006 to 2007, which is why this higher figure was used in the model.

Table 36: Real GDP growth projections (%)

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Poland										
annual	6.5	5.5	5.0	4.6	3.9	3.7	3.3	3.3	3.2	3.1
cumulative	106.5	112.4	118.0	123.4	128.2	133.0	137.4	141.9	146.5	151.0
Bulgaria										
annual	5.9	5.7	4.8	4.3	4.0	4.0	3.9	3.9	3.8	3.7
cumulative	105.9	111.9	117.3	122.3	127.2	132.3	137.5	142.8	148.2	153.7
Romania										
annual	6.0	6.1	5.6	5.2	5.0	4.7	4.0	3.9	3.8	3.6
cumulative	106.0	112.4	118.8	125.0	131.2	137.3	142.8	148.4	154.0	159.5

Note: Annual - percentage change from previous year; cumulative – cumulative growth (%) with year 2006=100%; the cumulative growth in 2016 is assumed as growth of certain model parameters as stated in the respective parameter descriptions.

Source: FAPRI (2008) and own calculations.

gross agricultural income of 5% was assumed considering general technical progress. In total this resulted in the assumption of an increase of gross agricultural income per ha by 155% between 2006 and 2016.

Moreover, it was assumed, based on expert assessments, that farm investments will change the production structure in favour of crop production during transition. However, on average the inputs needed for crop production, but also the gross income, are lower than for livestock production. As the model displays average values for production activities, the gross agricultural income per ha farmed is multiplied by 0.8 in the farm investment scenarios as well as the operational costs and labour input per ha farmed, in order to implement this assumption. This multiplier implies that the gross income per ha, the operational costs per ha, and the labour input per ha all decrease in the case of farm investments due to a shift in favour of crop production.

The initial values for the **operational costs per unit of activity** are the figures from the surveys for the base year. These figures are increased by the real GDP growth (FAPRI 2008; Table 36). For the farming activity, it was assumed that rising energy and input prices will lead to an increase of the operational costs per ha farmed that is higher than the forecast GDP growth. Hence, for

the operational costs per ha farmed a growth of 110% was assumed.

In the farm investment scenarios, the operational costs per ha farmed are multiplied by 0.8, assuming lower costs due to a changed production structure in favour of crop production (this assumption is explained in more detail in the previous paragraph about the gross income).

A lump sum for **return from investment** is included in the farm development scenarios and scenarios including the transitional semi-subsistence support measure. In the farm development scenarios, a lump sum return of 15% of an investment of 10,000 EUR was agreed by all project experts. Hence, 1,500 EUR are added as a lump sum to net agricultural production. This sum represents the higher turnover net of higher operational costs due to investment. In addition, another lump sum return is assumed in scenarios including the transitional semi-subsistence measure. For Poland the semi-subsistence payment is 1,250 €, for Bulgaria and Romania it is 1,500 €. A net return from the invested semi-subsistence payment of 100 EUR (6.6% of 1,500 € or 8% of 1,250 €) was agreed and added as a lump sum to net agricultural production.

Household expenditures are projected based on the base year data. For energy, transport, and education, cumulative growth of 80% up to the year 2016 is assumed based on expert assessments that took account of the estimated growth of energy prices above GDP growth trend. The growth trend for education is assumed the same as that in energy prices, as it is assumed that prices for services will also rise faster than GDP. For all other household expenditure except the investment, a growth trend is assumed according to the forecasts for real GDP growth from FAPRI (2008, Table 36).

For the “diversification” and “farm development” scenarios, annual investment costs are added:

For the “farm development” scenario, an investment of 10,000 EUR in farm development is assumed, from which the percentage of the investment that is covered by the policy measure is first subtracted. It is assumed that the remainder is covered by the household, which has to take out a bank loan to cover it. A duration of 5 years and an interest rate of 10% are assumed for the bank loan.

In the diversification scenarios, an investment of 10,000 EUR for starting a family business is assumed. For this investment, yearly household expenditure is adjusted as for farm investment, after subtracting the percentage of the investment covered by the state, and assuming a duration of loan repayments of 5 years, with an interest rate of 10%.

The variable **land rent** relates to the renting in or out of land. It is calculated as the amount of land rented in or out, multiplied by the land rent (EUR/ha), and is added to/subtracted from the household cash balance. They are based on assessments by the experts and figures given in the telephone interviews by the households for expected land rents.

Expenditure for **paid labour**: In all scenarios apart from the baseline and early retirement

scenarios, it is assumed that the household will employ one part-time farm worker (900 hours per year⁵³), in order to be able to shift individual household labour between activities. In the diversification scenarios, a part-time paid labour input (900 hours) is assumed for the self-employment activity. The hourly rate for paid labour is increased in line with the respective GDP growth forecast (FAPRI 2008, Table 36).

Total **household labour availability** sums over all activities the figures given in the telephone interviews on the allocation of labour time.

For farming the **Labour input per unit of activity** remains fixed at 2006 levels. An exception is made in the farm development scenarios, where the labour input per ha farming is multiplied by 0.8, assuming a lower labour input due to a changed production structure in favour of crop production⁵⁴.

The activities levels of dependent employment and self employment are directly measured in labour hours.

The household’s **labour input into other (non-income) activities** is set according to the results from the telephone interviews.

The **capacity for farming activity** cannot exceed the land available to the household in 2006. In the farm development scenario, it is assumed that the household is able to rent more

53 An annual work unit (AWU) is defined as 1,800 hours work per year (Eurostat 2008c).

54 It was assumed that farm investment will change the production structure in favour of crop production. On average, the inputs needed for crop production but also gross income are lower than those relating to livestock production. As the model displays average values for production activities, the gross agricultural income per ha farmed is multiplied by 0.8 in the farm investment scenarios as well as the operational costs and labour input per ha farmed, in order to implement this assumption. This multiplier implies that the gross income per ha, the operational costs per ha, and the labour input per ha all decrease in the case of farm investment due to a shift towards more crop production.

land up to a level that corresponds to 200% of the capacity for the farming activity in 2006.

The **value of own-consumed agricultural production** is increased by the assumed growth rate for income from the farming activity of 150%.

Other non-earned income is increased by the real GDP growth (FAPRI 2008, Table 36).

The **subsidies** (subsidies(sub)) that the households receive are determined by the policy measures that are assumed to be applied in the different decision scenarios (compare Table 34). For measures of the second pillar the actual figures were used, when the measure was implemented in the country. If it was not yet implemented, national experts assessed the future level based on the available information about the planned implementation of the measure. For the SAPS the full level of the payment after the phasing in of the measure was used in the model, based on the information of the national experts.

The **weights** for the four objective functions were derived from survey data. For each household simulated, the median value of the objective weight for the corresponding SFH type and country was used. As the objective “maximise household net income” from the survey is not included in the modelling approach, the survey figures for the objective “maximise household net income” and “maximise household cash balance” were pooled and a new median for the pooled figures of these objectives was calculated. In the next step, the resulting median and the medians of the other objectives were normalised⁵⁵.

7.5.3 Household-specific Simulation Parameters

Various parameters, such as minimum levels and labour capacities for activities, had to be set for each household, as described below.

In general the **minimum activity level** was set to values higher than zero depending on household aims. If the median rating of respective aim was 4 or 5 on the rating scale⁵⁶, for the SFH type and country, a minimum level for the respective income activities were set. The following aims were taken into consideration:

- “Diversify income sources” – setting a minimum level to dependent employment of 30% of the level of dependent employment in 2006.
- “Be rooted to the soil”, “conserve the heritage”, “keep up family’s traditions”, and “enjoy rural lifestyle” – setting a minimum level to farming of 50% of the cultivated area in 2006.

Exceptions were made in the farm development scenarios and scenarios with transitional semi-subsistence support, for which a higher minimum level was set for the farming activity. According to the assumed strategies in these decision scenarios, the minimum level of the farming activity was set to the cultivated area of the base year 2006, assuming that the household will at least maintain the actual level for receiving support from these measures.

In diversification scenarios, the minimum activity level is set to 1,800 hours per year for the self-employment activity. As it is assumed that the household uses 900 hours of paid labour in these scenarios, a minimum level of 1,800 hours requires an individual household labour input of at least 900 hours devoted to self-employment.

The resulting figures for minimum levels are household- and scenario-specific.

Bounds are also set for the available **labour capacity for each activity**. Household labour capacities for the income activities depend on

55 As averages are used, the weights do not sum up to one, which is why normalisation became necessary.

56 The structured questionnaire defined the following categories: 1: not important at all, 2: not important, 3: neither important nor unimportant, 4: important, 5: very important.

the number of household members, their age, their current allocation of time between domestic and agricultural work, and non-farm activities. If people older than 64 years are still working on the farm or in the family business, their maximum capacity is considered to be the same as their actual reported labour input for the respective activity. People older than 64 years are considered for dependent work only if they are currently employed. For farming, the labour capacity is set to the total labour capacity for income activities of the household.

Factors such as the educational level⁵⁷ of each household member determine whether that person could be employed in other activities apart from farming. A higher non-agricultural education increases the labour capacity for self-employed activities and dependent work. In general, the following rules for setting the labour capacities were followed: If the household member's educational level is below or equal to "elementary school", it is assumed that the

household member could not get a dependent job and so his labour capacity for dependent employment is assumed to be zero. For the educational level "vocational school", the total labour capacity of income activities is assumed as available for dependent employment. For an educational level of "secondary school, grammar school" or more, the total labour capacity of the household member is assumed to be available for all activities. In any case, the labour capacity for dependent employment cannot exceed 2,500 hours per capita and year.

If the household did not have a family business in 2006, labour capacity for self-employment is assumed to be available only in the respective diversification scenarios. If there are no household members with an educational level of "secondary school, grammar school" or more, the labour capacity for self-employment is set equal to the labour input of one adult household member in either dependent employment or farming in 2006.

57 The structured questionnaire defined the following categories of educational levels: 0: no studies and cannot read or write, 1: no studies but can read or write, 2: elementary school, 3: vocational school, 4: secondary school, grammar school, 5: other occupation specific higher education, 6: B.Sc. (college, university), 7: M.Sc. (university), 8: post graduate studies; 9: Ph.D. studies (university).

■ Appendix 7.1: Equations of the programming model

The equations of the programming model are given below in GAMS notation. They consist of the four objective functions, the equations of the matrix of constraints, and the right-hand side (RHS) of the constraints, e.g. the bounds on resource use. Tables 33, 34 and 35 summarise the abbreviations used in these equations.

Equation 1: Objective functions of the programming model⁵⁸

$$\begin{aligned} \max \quad & net_agr_prod = level(farm) * inc(farm) - level(farm) * o_cost(farm) \\ & \quad - ex_labour(farm) + invest \\ \max \quad & net_off_inc = \sum_{activity=2}^3 [level(activity) * inc(activity) - level(activity) * o_cost(activity) \\ & \quad - ex_labour(activity)] \\ \max \quad & hh_cash = \sum_{sub=1}^1 subsidies(sub) + \sum_{oth=1}^4 oth_inc(oth) + net_off_inc + net_agr_prod - \sum_{ex=1}^8 h_ex(ex) \\ & \quad - own_use - [level(farm) - own_land] * land_rent + level(farm) * SAPS \\ \min \quad & labour(farm) = level(farm) * lab(farm) \end{aligned}$$

Equation 2: Calculation of labour input and its costs

$$\begin{aligned} labour(activity) &= level(activity) * lab(activity) \\ own_lab(activity) &= labour(activity) - p_lab(activity) \\ ex_labour(activity) &= p_lab(activity) * lab_cost(activity) \end{aligned}$$

Equation 3: Calculation of household labour use

$$hh_lab = \sum_{oth_act=1}^5 oth_lab(oth_act) + \sum_{activity=1}^3 own_lab(activity)$$

Equation 4: Bounds / RHS

$$\begin{aligned} land &\leq level(farm) \leq land_cap \\ 0 &\leq own_lab(activity) \leq lab_cap(activity) \quad \forall activities \\ 0 &\leq hh_lab \leq hh_lab_cap \\ level(activity) &\geq minimum(activity), \quad \forall activities \end{aligned}$$

⁵⁸ The terms “level(activity)” and “level(farm)” represent the decision variables of the model.

The terms “inc(activity)” and “inc(farm)” minus the terms “o_cost(activity)” and “o_cost(farm)” (minus “land_rent” plus “SAPS” for the objective hh_cash) represent the objective coefficients.

The term “lab(activity)” represents the coefficients of the labour restriction with “hh_lab” being the total labour use and “hh_lab_cap” the RHS.

The other terms are parameters representing fixed items, e.g. expenditures and income from subsidies, and are thus just subtracted or added to the total of the respective functions.

Table 37: Indices used in the programming model

Abbreviation	Description
activity /farm, self, dep/	Three income activities: farming, self-employment, and wage job
ex /energy, food, transp, farm_inv, self_inv, edu, support, o_ex/	Eight categories of household expenditures: energy, food, transport, farm investments, investments in family business, education, support of other people, and other expenditures
sub / retire/	One subsidy item: early retirement payment
oth /pensions, benefits, remitt, other/	Four categories of other (non-earned) income: pensions, social benefits, remittances, and other income
oth_act /processing, household, education, childcare, leisure/	Five other household activities: processing, household keeping, education, taking care of children, sick, and older people, and leisure
obj /net_agr_production, net_off_farm_inc, hh_cash_bal, agr_lab_input/	Four objectives: net agricultural production (max), net non-farm income (max), household cash balance (max), and agricultural labour use (min)

Table 38: Parameters in the programming model

Abbreviation	Description	Unit
ex_labour(activity)	Household expenditures for paid labour	EUR
hh_ex	Sum of household expenditures over expenditure positions	EUR
hh_lab_cap	Household labour capacity	hours
inc(activity)	Turnover or gross income per unit of activity	EUR/hour and EUR/ha for farming
Invest	Lump-sum for return from investments (farm investment, invested TSS payment)	EUR
lab(activity)	Labour input per unit of activity	hour/hour and hour/ha for farming
lab_cap(activity)	Labour capacity for activity	hour
lab_cost(activity)	Costs of paid labour per hour	EUR
land_cap	Capacity of land for farming	ha
land_rent	Land rent per ha rented land	EUR/ha
minimum(activity)	Minimum level for each activity	ha for farming (land), hour for other activities
o_cost(activity)	Operational costs per unit of activity	EUR/hour and EUR/ha for farming
objwt(obj)	Weights for the objective functions	No unit
oth_inc(oth)	Other (non-earned) income	EUR
oth_lab(oth_act)	Household labour use for other activities	hour
own_land	Own land in 2006 from survey data	ha
own_use	Value of the own consumed agricultural production	EUR
p_lab(activity)	Paid labour input per activity	hour
SAPS	Payment from the single area payment scheme	EUR/ha
subsidies(sub)	Subsidies received	EUR

Note: Parameters are constants within the model, which are determined by the modeller. Costs per unit of hired labour or per unit of income activity, but also all model constraints, are typical parameters within a linear programming framework.

Table 39: Variables in the programming model

Abbreviation	Description	Unit
hh_cash_bal	Annual household cash balance	EUR
hh_lab	Used household labour	hour
labour(activity)	Labour use per activity	hour
level(activity)	Activity levels: farming, self-employment, and dependent employment	hour and ha for farming
net_agr_prod	Net agricultural production	EUR
net_hh_inc	Net household income	EUR
net_off_inc	Net non-farm income	EUR
own_lab(activity)	Individual household labour input per activity	hour

Note: Within a modelling framework the word variable denotes what economists call “endogenous variable” (Brooke et al. 1992). Variable values are chosen within the model so that an objective function is optimised. Simply spoken, variable values are what the model decides. Activity levels, labour use, and net household income are typical examples of variables.

Source: Own table.

■ Appendix 7.2: Further Details of Household-specific Parameters by SFH Type

Polish rural diversifiers

The aim “diversify income sources” is important for this group, so the minimum level of dependent employment is set at 30% of the 2006 dependent employment labour input (558 hours per year). They attach little weight to aims concerning the farming activity and therefore, no minimum level for farming activity is set. Both adult household members have a education level higher than “secondary school, grammar school” (MSc university degree)⁵⁹. Hence, their total labour capacity for income activities of 4,380 hours per year is assumed available for all income activities.

The selected household ran a family business in 2006. For this business the 2006 gross income per unit of this activity was 0.85 EUR/hour and the stated costs 0 EUR/hour. This income and cost values were increased by GDP growth forecast (FAPRI 2008, Table 36) and considered in all scenarios. This is in contrast to other households that had no family business in 2006, for which self-employment is only considered in the respective diversification scenarios.

Furthermore, for diversification scenarios it is assumed: (a) the household starts a second family business in all scenarios that include diversification; thus, average costs and income per unit of self-employment activity from the Polish survey data are added to the income and costs

of the first family business in the diversification scenarios; (b) as the household now runs two family businesses, labour input per unit of self-employed activity changes from one to two hours per unit activity. The minimum level for self-employment is 900 hours in the diversification scenarios to be consistent with the other scenarios and assuming an input of individual household self-employment labour of at least 900 hours.

Romanian rural diversifiers

All the aims considered are important for Romanian rural diversifiers. Therefore, the minimum level for farming is set at 50% (1.1 ha) of the 2006 cultivated area 2006, and the minimum level for dependent employment at 1,243 hours, which is 30% of the 2006 dependent employment labour input.

One household member has the educational level “vocational school”, one has “secondary school, grammar school”, and two have the level “B.Sc. – college, university”. Therefore, total labour capacity of the household would be 7,511 hours for farming and/or dependent employment. However, for dependent employment the labour capacity of the first member (2,590 hours) exceeds the assumed maximum labour input for dependent employment of 2,500 hours, so total labour capacity for dependent employment is reduced to 7,421 hours (=7,511–90). Self-employment labour capacity is set to 4,921 hours, which is the total labour capacity of all household members with an educational level greater than “vocational school”.

59 This selected household has a very high education level (7). However, the average educational level for rural diversifiers is also high (5). According to the general rules for setting maximum labour capacities, the same maximum labour capacity would have been set for a rural diversifier household having the average education level of rural diversifiers (5). Hence, the high educational level does not influence the setting of parameters.

This household was selected as it is closer to the median variable values than other households. And the drawbacks of other households were assessed less suited than the high educational level of this household by the national experts

Bulgarian rural diversifiers:

All aims are important for Bulgarian rural diversifiers, and thus the minimum level for farming is set at 50% (1.31 ha) of the 2006 cultivated area. The minimum level for dependent employment is 1,250 hours, which is 30% of the 2006 dependent employment labour input to dependent employment.

The bounds for total household labour capacities per income activity are set equal to the total labour capacity of 5,986 hours per year for the farming activity. One household member is of pensioner age. The other two members work in dependent employment and are at “occupation-specific higher education” level, hence they have potential for activities other than farming. Therefore, the labour capacity for self-employment is set to the total labour capacity of these two household members of 5,489 hours. For dependent employment, the labour input is assumed as limited to 2,500 hours per capita and set to 5,000 hours.

Polish rural pensioners

The aim “diversify income sources” is not important for Polish rural pensioners and no minimum level for dependent employment is set. The median rank of the aim “be rooted to the soil” is important, but since the other farming-related aims are unimportant, no minimum level is set for the farming activity. As the household did not have any dependent employment in 2006, income and costs of dependent employment are set to the country average calculated from survey data.

One household member has an educational level of “elementary school” and the second of “secondary school, grammar school”. Therefore, the full labour capacity of the household members of 1,643 hours is set as the upper bound for the farming activity. For the activities self-employment and dependent employment, only the labour capacity of the second household member (548 hours) is considered to be relevant.

As the household has a low labour capacity for self-employment, the minimum level for self-employment was set at a lower level than for the other households (i.e. 1448 hours instead of 1,800 hours), which was the sum of the paid labour input (900 hours) and the individual household labour capacity (548 hours).

Romanian rural pensioners

All aims considered are important for Romanian rural pensioners. Therefore, the minimum level for farming area is set to 1.32 ha, which is 50% of the 2006 level. No minimum level for dependent employment is set, as the household did not have a dependent employment in 2006, and the income and costs of dependent employment are set to the country average calculated from survey data.

The educational level of one household member is “secondary school, grammar school”, but due to his age (66 years) his labour capacity is not considered relevant for dependent employment. The second member has an educational level of “elementary school” and his labour capacity is considered for farming only. The total labour capacity of the household members for farming amounts to 4,403 hours. In order to calculate diversification scenarios, the labour capacity of the first household member (2,231 hours) is taken as the upper bound for self-employment, although this activity is unlikely for this household, due to the older age of one household member and the low educational level of the other. The labour capacity for dependent employment is set to zero.

Bulgarian rural pensioners

Since all aims considered are important for Bulgarian pensioners, the minimum level for farming is set at 0.47 ha (50% of the 2006 cultivated area). As no household member had a dependent employment in 2006 no minimum level for dependent employment is set.

Both household members have an educational level of “secondary school, grammar school”. Therefore, the labour capacity for farming, self-employment and dependent employment is set to the total labour capacity of 2,611 hours.

Polish farmers

All aims considered are important, and so the minimum level for dependent employment is set to 657 hours (30% of the level in 2006) and the minimum level for farming is set to 4.25 ha (50% of the level in 2006).

The labour capacity for farming is set equal to the total labour capacity of 5,110 hours. The educational level of both adult household members is “vocational school”. Hence, it is assumed that their labour capacity is available for dependent employment and it is set to 4,754 hours. Due to the rather low educational level of the adults, it is assumed that self-employment is only a limited option for this household and its labour capacity for self-employment is set equal to the labour input of the adult household member to dependent employment (2,190 hours).

Romanian farmers

All aims considered are important for Romanian farmers. Therefore, the minimum farming area is set to 50% of the 2006 cultivated area (3.5 ha). In 2006 no household member had dependent employment, so no minimum level for dependent employment is set, and income and costs of dependent employment are set to the country average calculated from survey data.

One household member has an educational level of “vocational school” and a total labour capacity of 2,590 hours. The upper bounds for farming and self-employment are set to this value. The upper bound for dependent employment is set to 2,500 hours.

Bulgarian farmers

As the aim “diversify income sources” is not important for Bulgarian farmers, no minimum level for dependent employment is set. Although the aims “be rooted to the soil” and “enjoy rural lifestyle” are unimportant, “conserve the heritage” and “keep up family traditions” are considered important. As these two aims are relevant for the attitudes towards farming, the minimum level for the farming activity is set to 7.7 ha, which is 50% of the 2006 level of 2006. As the household had no dependent employment in 2006, income and costs of dependent employment are set equal to the country average calculated from survey data.

The educational levels of the two household members are “vocational school” and “secondary school, grammar school”. Hence, the total labour capacity of the household of 3,230 hours is set as upper bound for farming and dependent employment. For self-employment only the labour capacity of the second household member (2,049 hours) is considered.

Polish rural newcomers

This group considers all the aims are important and so minimum levels for dependent employment and farming are set to 30% and 50% of the 2006 level, respectively (164 hours dependent employment and 3.2 ha farming).

The bounds for individual household labour capacities per activity are set to the total labour capacity of 2,008 hours, as one household member has an educational level of “vocational school”. Although this member had dependent employment in 2006, it can be assumed that he has the potential for activities other than farming.

Romanian rural newcomers

Minimum levels for dependent employment and farming are set, as all considered aims are

important for Romanian rural newcomers, at 30% (653 hours) of the 2006 level and at 50% (2 ha) of the 2006 level, respectively.

There was no survey data about costs on the farming activity available for the selected Romanian rural newcomer households. Therefore, the average costs per ha of all Romanian rural newcomers were calculated from survey data and set as parameters for the selected households.

The educational levels of the two adult household members are just “elementary school” for one member and “vocational school” for the other. Therefore, the labour capacity for dependent employment is set at 2,500 hours, assuming that only one household member is able to find a dependent job and that this member can shift only a certain amount of labour capacity from farming to dependent employment. It is assumed that self-employment is only a limited option for this household and the labour capacity for self-employment is set to 2,176 hours, which equals

the labour input to dependent employment in 2006. The labour capacity for farming is set to the total labour capacity for income activities of the household in 2006 (7,148 hours).

Bulgarian rural newcomers

The aim “diversify income sources” is not important for Bulgarian rural newcomers and no minimum level for dependent employment is set. As the farming related aims are important, the minimum level for farming is set at 50% of the 2006 level in 2006 (0.25 ha).

The educational level of both adult household members is “secondary school, grammar school” and it is assumed that the total labour capacity of both adult household members (5,905 hours) is available for all activities. However, for dependent employment, a labour input of more than 2,500 hours per capita is considered impossible and the labour capacity for dependent employment is set to 5,000 hours.

■ 8 Simulation Results

The model calculates the optimal activity levels for each decision scenario, given its parameters and the objective functions. A comparison of the results of the scenarios with those of the baseline shows what the consequences would be if the SFH in question opted for the measure or combination of measures assumed in the respective scenario. The focus of the discussion is on the comparison of household cash balances across the different decision scenarios, showing which decision strategy would be the most beneficial option for each household type in the future.

The discussion is guided by the following questions: (i) What is each households' cash balance in the simulated baseline scenario after 10 years during which no rural development measure is applied, as compared to the actual cash balance in 2006? (ii) After a period of 10 years has elapsed, what is the household cash balance, in each different decision scenario, as compared to the baseline scenario? (iii) How does the transitional semi-subsistence support measure affect household cash balances? (iv) What are the most beneficial options for the different household types in the future?

The chapter is organized as follows: Section 8.1 presents household cash balances simulated for the baseline scenario and the different decision scenarios. In Section 8.2, the favourability in terms of the resulting household cash balances of the different simulated strategies is discussed for each SFH type. The impact of the transitional semi-subsistence measure is discussed in Section 8.3. Finally, section 8.4 gives the results of a sensitivity analysis. The tables listing the simulation results in detail are contained in the Annex.

8.1 Development of Simulated Household Cash Balances

This section begins by comparing the simulated household cash balances in the baseline scenario for 2016 with actual cash balances in 2006. Then, for the year 2016, simulated household cash balances corresponding to each decision scenario are compared with those obtained under the baseline scenario. Finally, the rankings of the simulated household cash balances are discussed.

8.1.1 Development of Simulated Household Cash Balances in the Baseline Scenario

Table 40 shows how household cash balances are expected to evolve by 2016 when no rural development measures are applied (baseline scenario), compared to the situation observed in 2006. The results can be interpreted as the effect of a strategy of “continue as at present” in the absence of any rural development policy incentives or constraints. Regardless of the sample country, rural pensioners are worse off after 10 years with this strategy. Nevertheless, it seems to be a feasible strategy for all other types of SFHs in Poland and Bulgaria, as for them the cash balance increases relative to the baseline scenario. An exception is Romania, where only rural diversifiers are better off by continuing in their current income activities, and yet even for this type of SFH the household cash balance remains negative.

Seven of the twelve households (58%) would see their cash balance improve after 10 years, relative to 2006, without adopting any rural development measures (Table 40). Three of these households would see an already positive cash balance increase further, and two households that had a negative cash

Table 40: Comparison of simulated household cash balance in baseline scenario with actual cash balance in 2006

	Rural diversifiers	Rural pensioners	Farmers	Rural newcomers
Poland				
2006	+	-	-	-
2016 base	++	--	++	-+
Romania				
2006	-	+	-	-
2016 base	-+	--	--	--
Bulgaria				
2006	-	-	+	+
2016 base	++	--	++	++

Notes: +: Household cash balance is positive in 2006. -: Household cash balance is negative in 2006. ++: Household cash balance is positive in 2016 and higher than in 2006. + -: Household cash balance is positive in 2016 but lower than in 2006. -+: Household cash balance is negative in 2016 but higher than in 2006. --: Household cash balance is negative in 2016 and lower than in 2006.

Source: Own simulation results with data from project survey.

balance situation in 2006 would have a positive one in 2016. However, the remaining two households would still have a negative cash balance in 2016 despite some improvement.

The other five of the twelve households are worse off when continuing their current way of income earning without adopting any rural development measures. For one household, this strategy alters a positive household cash balance in 2006 to a negative one in 2016, while for the other four households an already negative cash balance becomes even worse in 2016.

8.1.2 Development of Simulated Household Cash Balances in the Decision Scenarios

The **farm development** strategy is an alternative for households that are already engaged in farming. Table 41 illustrates that indeed most of the simulated households could profit from a farm development strategy. The only exception is the SFH type rural newcomers in Romania. The reason why the Romanian rural newcomer does not profit from a farm development strategy is its rather low income from farming (per hectare farmed), in combination with production that is more labour intensive compared to the other simulated households.

Among the eleven households (92%) that could increase their cash balance under a farm development scenario, five households would improve an already positive cash balance, two would turn a negative cash balance into a positive one, and four households would still have a negative cash balance but with a lower annual loss. One household would see a further deterioration in an already negative cash balance.

Another alternative strategy to farm development is to **start a non-farm self-employed income activity**. Table 42 shows that this would be a favourable strategy for all Bulgarian SFH types, while it would worsen household cash balances for all Polish SFHs. In Romania, only farmer SFHs would be worse off when adopting a diversification strategy.

Among the seven households (58%) that could improve their household cash balance through diversification, three households would improve an already positive cash balance, two households would turn a negative cash balance into a positive one, while the other two households would still end up with a negative cash balance (Table 42). From the five households (42%) that would be worse off, diversification would mean for one household that a positive household cash balance

Table 41: Household cash balance with farm development (no transitional semi-subsistence payment) compared with household cash balance in the baseline scenario

	Rural diversifiers	Rural pensioners	Farmers	Rural newcomers
Poland				
.base	+	-	+	-
.farm	++	++	++	++
Romania				
.base	-	-	-	-
.farm	-+	-+	-+	--
Bulgaria				
.base	+	-	+	+
.farm	++	-+	++	++

Notes: +: Household cash balance is positive in baseline scenario. -: Household cash balance is negative in baseline scenario. ++: Household cash balance is positive with farm development (no TSS) and higher than in baseline scenario. +-: Household cash balance is positive with farm development (no TSS) but lower than in baseline scenario. -+: Household cash balance is negative with farm development (no TSS) but higher than in baseline scenario. --: Household cash balance is negative with farm development (no TSS) and lower than in scenario.

Source: Own simulation results with data from project survey.

Table 42: Household cash balance with diversification (no transitional semi-subsistence payment) compared with household cash balance in the baseline scenario

	Rural diversifiers	Rural pensioners	Farmers	Rural newcomers
Poland				
.base	+	-	+	-
.self	--	--	+-	--
Romania				
.base	-	-	-	-
.self	++	-+	--	-+
Bulgaria				
.base	+	-	+	+
.self	++	++	++	++

Notes: +: Household cash balance is positive in baseline scenario. -: Household cash balance is negative in baseline scenario. ++: Household cash balance is positive with diversification (no TSS) and higher than in baseline scenario. +-: Household cash balance is positive with diversification (no TSS) but lower than in baseline scenario. -+: Household cash balance is negative with diversification (no TSS) but higher than in baseline scenario. --: Household cash balance is negative with diversification (no TSS) and lower than in scenario.

Source: Own simulation results with data from project survey.

would become negative, for three households an already negative cash balance would be even worse, and one household would keep its positive cash balance although it would be lower.

Simulation results show that even if households start a non-farm family business, the household cash balance does not necessarily improve. In many cases, the income assumed to come from a non-farm self-employed activity is not fully substitute for income from farming

and/or dependent employment when household labour is shifted to the self-employed activity. Moreover, setting up a non-farm business is a challenging task that only a few households could manage. In particular rural pensioners, who have a high average age, and for rural newcomers, who on average have a low education level, setting up a family business seems hardly feasible as an option. Thus, income diversification by means of self-employment cannot be considered a universal remedy for SFHs.

Table 43: Household cash balance with early retirement compared with household cash balance in the baseline scenario

	Rural diversifiers	Rural pensioners	Farmers	Rural newcomers
Poland				
.base	+	-	+	-
.retire	++	--	+-	++
Romania				
.base	-	-	-	-
.retire	--	--	--	--
Bulgaria				
.base	+	-	+	+
.retire	--	++	--	--

Notes: +: Household cash balance is positive in baseline scenario. -: Household cash balance is negative in baseline scenario. ++: Household cash balance is positive in early retirement scenario and higher than in baseline scenario. + -: Household cash balance is positive in early retirement scenario but lower than in baseline scenario. - -: Household cash balance is negative in early retirement scenario but higher than in baseline scenario. --: Household cash balance is negative in early retirement and lower than in scenario.

Source: Own simulation results with data from project survey.

Households also could cease farming and apply for **early retirement support**. This strategy would worsen the cash balance situation for nearly all types of households as compared to the baseline scenario (Table 43). Only Polish rural diversifiers and rural newcomers, and Bulgarian rural pensioners, could improve their situation by embarking on this strategy. The reason is that the simulated households of these SFH types have sufficient labour capacity for wage employment and also the ability to earn enough income from wage employment to compensate for the income loss from giving up the farming activity. However, due to the average age of the rural newcomers (35 years) and of the rural pensioners (65 years), the majority of SFHs belonging to these types are not eligible for the early retirement measure. In addition, without the early retirement payment the household cash balance of the Polish rural newcomers and the Bulgarian rural pensioners would be even lower than in the baseline scenario if they gave up their farming activity.

Hence, early retirement can be considered as a feasible option for the Polish rural diversifiers only. All other simulated SFHs are either not eligible for early retirement or are not able to compensate by other income sources for the income loss from giving up farming.

Among the three households (25%) that could improve their situation by early retirement, one household enhances an already positive cash balance while the other two households turn a negative cash balance into a positive one (Table 43). Out of the nine households (75%) whose situation would worsen with early retirement, the three households that would be viable under the “continue as at present” strategy would become non-viable. One household would, despite being worse off, still remain viable, while the other five households would end up with an even worse negative cash balance.

8.1.3 Rankings of the Simulated Household Cash Balances

The rankings⁶⁰ of the household cash balances resulting from scenarios without the transitional semi-subsistence measure are reported in Table 44.

Results show that there are differences in the impact of policy measures on household cash balances according to SFH type and country. Nevertheless, some general tendencies can be

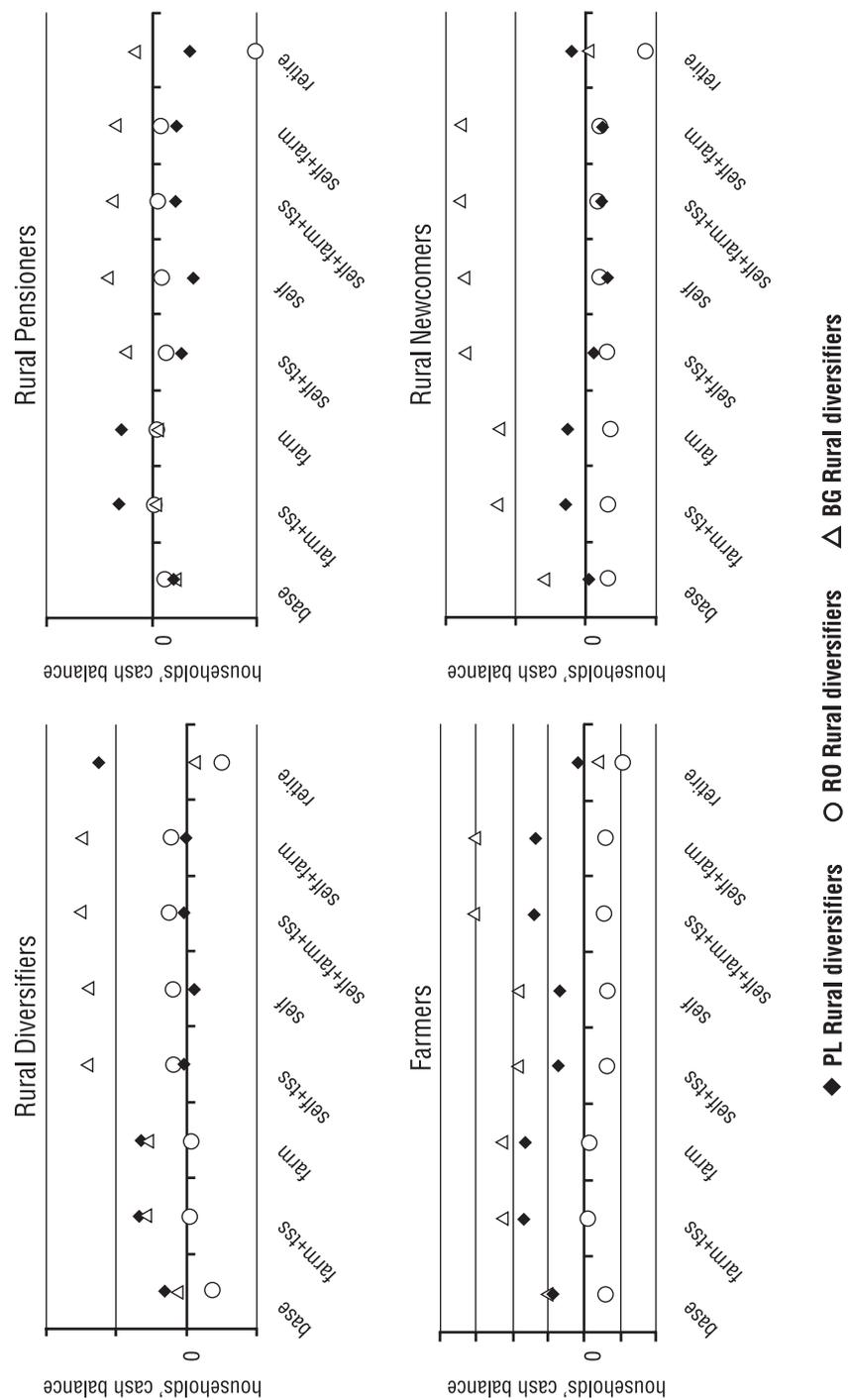
⁶⁰ Ranks summarise simulation results while ignoring the absolute differences between the scenarios. For discussing the excellence of the single scenarios, ranks are well suited. Scenarios with the highest cash balance were ranked 1 and those with the lowest cash balance scored 5.

Table 44: Median ranks for countries and all simulated households

Scenario	Bulgaria	Poland	Romania	Median ranks for all simulated households
baseline	4.0	3.0	3.5	3.5
farm	3.0	1.0	2.0	2.0
self	2.0	5.0	2.5	3.0
farm+self	1.0	3.5	1.5	2.0
retire	5.0	3.0	5.0	5.0

Source: Own simulation results with data from project survey.

Figure 16: Simulated households' cash balances in baseline and decision scenarios



Source: Own figures with data from simulation results.

observed in the simulation results for the semi-subsistence sector in the survey countries. Farm development is a feasible strategy for most SFHs whereas early retirement reduces household cash balances (Table 44). Starting a self-employed income activity and strategies without investment either in farming or in self-employed activity result in household cash balances that range in-between.

There are also country-specific factors that affect the desirability of individual scenarios in terms of cash balances. For Bulgarian SFHs, strategies that involve starting a self-employed income activity involve the highest cash balances (Table 44). The next best option is farm development whereas “continue as at present” (baseline) and an early retirement strategy cause the lowest cash balances of all strategies. Polish SFHs would be best off with farm development strategies whereas self-employment would reduce household cash balances. However, early retirement or “continue as at present” are relatively poor options for Bulgarian and Romanian SFHs. Romanian SFHs would do best with a combination of farm development and self-employed income diversification. “Continue as

at present” and early retirement result in the lowest cash balances for Romanian SFHs.

8.2 Comparison of the Simulated Strategies for Each SFH Type

This section compares the simulated strategies without the transitional semi-subsistence measure in terms of household cash balances for the different SFH types. The levels of the respective cash balances resulting from all simulated scenarios are depicted in Figure 16, and Table 45 to Table 48 show the rankings of cash balances for the same scenarios.

8.2.1 Comparison of Strategies for Rural Diversifiers

In the baseline scenario, the Polish and the Bulgarian households achieve a positive cash balance, whereas the cash balance of the Romanian household remains negative. For rural diversifiers combining farm development and starting a self-employed activity, or starting a

Table 45: Ranks of household cash balances for rural diversifiers

Scenario	Bulgaria	Poland	Romania	Median ranks for rural diversifier
Baseline	4	3	4	4
Farm development	3	2	3	3
Start self-employment	2	5	2	2
Farm development and start self-employment	1	4	1	1
Early retirement	5	1	5	5

Source: Own simulation results with data from project survey.

Table 46: Ranks of household cash balances for rural pensioners

Scenario	Bulgaria	Poland	Romania	Median ranks for rural pensioners
Baseline	5	2	4	4
Farm development	4	1	1	1
Start self-employment	1	5	3	3
Farm development and start self-employment	2	3	2	2
Early retirement	3	4	5	4

Source: Own simulation results with data from project survey.

self-employed activity without farm development result in the highest household cash balances as compared to other strategies. The strategies “continue as at present” (baseline scenario) or early retirement result in the lowest household cash balances.

However, Polish rural diversifiers are an exception to this general rule. For them, early retirement and farm development give the highest cash balances, whereas starting a self-employed activity outside agriculture is the only strategy that would lead to a negative household cash balance.

8.2.2 Comparison of Strategies for Rural Pensioners

All simulated rural pensioner households have a negative household cash balance in the baseline scenario.

Rural pensioners’ households do not attain viability in the simulated decision scenarios. The only exceptions are the Bulgarian household, which becomes viable when embarking on early retirement or self-employment, and the Polish household, which attains a positive household cash balance through farm development. Moreover, farm development is the only strategy that increases the household cash balance of all simulated rural pensioner households.

However, given the high average age of rural pensioners (median age of 65 years) and their difficult income situation, farm development or starting a family business would possibly be

too demanding for most households of this SFH type. Moreover, most rural pensioner households are not eligible for the early retirement measure because they are over the age limit. Hence, how SFHs of this type could improve their precarious situation remains a major question.

8.2.3 Comparison of Strategies for Farmers

For the SFH type farmers the strategy “continue as at present” (baseline scenario) provides positive household cash balances in Poland and Bulgaria, but not in Romania. Households of this SFH type achieve the highest household cash balances with the farm development scenario. The simulated Bulgarian household achieves an even higher cash balance in the scenario combining farm development with starting a family business.

By starting a non-farm self-employed activity in the diversification scenario without farm development only the Bulgarian farmers achieve a cash balance that is higher than in the baseline scenario. The early retirement scenario results in the lowest household cash balances and is therefore a poor option for this SHF type as compared to the strategies examined.

8.2.4 Comparison of Strategies for Rural Newcomers

The baseline scenario results in negative household cash balances for the Polish and the Romanian household, whereas the Bulgarian household achieves a positive cash balance.

Table 47: Ranks of household' cash balances for farmers

Scenario	Bulgaria	Poland	Romania	Median ranks for farmers
Baseline	4	3	3	3
Farm development	2	1	1	1
Start self-employment	3	4	4	4
Farm development and start self-employment	1	2	2	2
Early retirement	5	5	5	5

Source: Own simulation results with data from project survey.

Table 48: Ranks of household' cash balances for rural newcomers

Scenario	Bulgaria	Poland	Romania	Median ranks for rural newcomers
Baseline	4	3	3	3
Farm development	3	1	4	3
Start self-employment	2	5	2	2
Farm development and start self-employment	1	4	1	1
Early retirement	5	2	5	5

Source: Own simulation results with data from project survey.

For rural newcomers, starting a non-farm self-employed activity and farm development are the strategies that provide the highest household cash balances while “continue as at present” (baseline scenario) and early retirement result in the lowest cash balances.

However, the results are different for the simulated Polish rural newcomers household. The Polish household achieves the highest cash balance in the farm development scenario and the second best positive cash balance under an early retirement scheme. Starting self-employment would result in the most negative households' cash balance out of all strategies for the Polish SFHs.

As the average age of rural newcomers is low (35 years), the majority of households of this type is not eligible for the early retirement measure. Furthermore, the low educational level of rural newcomers' households hampers the already challenging option of starting a non farm self-employed activity.

8.3 Impact of the Transitional Semi-subsistence Support Measure

For the simulation of scenarios that include the transitional semi-subsistence support measure, it was assumed that the household invests the semi-subsistence payment in farming and receives a certain lump sum as return from this investment. Given the amount of the semi-subsistence payment, the return from investing it can only be a small amount and was set for the simulations to 100 EUR. In addition, it was

assumed that the household has to maintain at least the level of farming that it had in 2006 in scenarios with the semi-subsistence payment⁶¹. For assessing the effect of the transitional semi-subsistence support measure, the simulation results of the decision scenarios with and without this measure are compared.

Simulation results show that the transitional semi-subsistence support does not have an impact on the allocation of individual household labour or the household's activity levels in all scenarios that imply farm development. In these scenarios the effect of the measure was simply to increase the household cash balance by exactly the 100 EUR that was assumed in the model to be the net return from investing the payment in the farm.

Unlike the scenarios that imply farm development and to scenarios with the semi-subsistence payment, in diversification scenarios without the semi-subsistence payment households may reduce farming and shift labour to other activities. Therefore, diversification scenarios show a different allocation of individual household labour and different activity levels under certain conditions in scenarios including

⁶¹ The transitional semi-subsistence measure includes the obligation to increase the farm size by 3 ESU within three years in Romania and five years in Bulgaria. In Poland, farmers have only to provide a simple business plan and prove that they implemented actions from the business plan to be considered under the transitional semi-subsistence measure. Hence, in decision scenarios including the semi-subsistence measure, it is assumed that the household will focus its strategy on the farming activity and at least maintain the level of farming that it had in 2006.

Table 49: Differences in the simulated household cash balances in diversification scenarios with and without the transitional semi-subsistence payment (EUR)

	Rural diversifiers	Rural pensioners	Farmers	Rural newcomers
Poland	740	504	100	972
Romania	43	-192	100	-436
Bulgaria	100	-910	100	-86

Note: The table shows the household cash balance in the diversification scenario with TSS minus the cash balance in the diversification scenario without TSS. Negative values indicate that the household cash balance would be higher without transitional semi-subsistence support than with the measure.

Source: Own simulation results with data from project survey.

the semi-subsistence payment rather than in scenarios without that payment. In diversification scenarios without the semi-subsistence payment, certain households allocate individual household labour from the farming activity to a non-farm activity. This results in changes in households' cash balances that differ from the assumed net return of 100 EUR.

Table 49 depicts the effect on household cash balances in diversification scenarios without the semi-subsistence payment as compared to the diversification scenarios with this payment for the 12 simulated households.

For all farmer SFHs, and for Bulgarian rural diversifiers, the effect of the transitional semi-subsistence measure is the same and the assumed net profit of the measure re-emerges in the cash balance.

For Polish rural diversifiers, rural pensioner, and rural newcomers, the effect of the semi-subsistence measure was bigger than the assumed net return of 100 EUR. The cash balance of these households decreases when individual household labour is allocated to non-farm employment in the diversification scenario without the semi-subsistence measure. The reason for shifting individual household labour to non-farm employment, despite the lower cash balance, is a preference of these households for the diversification of income sources as expressed in respective aims and weights for the objectives. If these households opted to maintain farming and received semi-subsistence support, the transitional semi-subsistence measure would

distract them from non-farm activities and push them into farming from which they receive a higher income. However, these households have rational reasons for the specific preferences for non-farm income and looking at the cash balance alone would not consider these reasons.

For Romanian rural diversifiers, the effect was less than the assumed return of 100 EUR but still positive, which shows that the household would have in fact a higher income from non farm activities. For Romanian and Bulgarian rural pensioners and rural newcomers, household cash balance would deteriorate if the households were trying to diversify their income sources and at the same time to develop their farm under the transitional semi-subsistence measure. The decline could be as much as nearly 1,000 EUR. For all these households, the additional shift of individual household labour to non-farm income in the diversification scenario without the semi-subsistence measure results in a higher household cash balance. For the Romanian rural diversifiers, the cash balance decreases in the diversification scenario without the semi-subsistence measure, but this decrease would be smaller than the assumed return of 100 EUR from the transitional semi-subsistence measure. In all these cases, it would be counter-productive if the households opted to maintain farming in order to receive the semi-subsistence support, since this measure would keep these households in a farming activity that is less profitable for them than non-farm activities.

The results show that the impact of the transitional semi-subsistence measure on households' viability will generally be positive

but small. This small positive effect results from the assumption of a net return from the invested semi-subsistence payment of 100 EUR. Another effect of this measure will surely be that it keeps households in farming, when they opt to apply for the measure. This may cause an important impact under specific conditions. In cases when the household prefers non-farm activities but the income per working unit from farming exceeds the income from non-farm activities, the simulation results show a higher net surplus when the household is constrained to maintain farming activity in diversification scenarios with semi-subsistence support. But also the reverse situation could be observed. When the income per working unit from farming is lower than the income from non-farm activities, the transitional semi-subsistence measure would keep households in farming that would otherwise leave the sector and earn a higher cash surplus outside agriculture.

8.4 Results of Sensitivity Analysis

In order to test the stability of the simulation results, sensitivity analyses were carried out for the Polish rural newcomers' household. When critical model parameters are varied, the consequences for important output variables can be assessed. Our model is driven by three key assumptions: (i) turnover or gross income per unit of an activity, (ii) operational costs, and (iii) labour capacity. For the farming activity in particular, there are some uncertainties since the assumed growth rates for agricultural turnover and operational costs are based on experts' assessments. Therefore, the focus of the sensitivity analyses was placed on the parameter operational costs per unit activity. Six sensitivity analyses were carried out, as summarised in Table 50.

Table 51 summarises the key results of the sensitivity analyses. In all six cases, there were no

Table 50: Description of sensitivity analysis: Change in operational costs (%)

	Analysis #					
	1	2	3	4	5	6
Operational cost per unit farming	+15	+30				
Operational cost per unit self employment			+10	-10		
Operational cost per unit dependent employment					+10	-10

Source: Own simulation results with data from project survey.

Table 51: Results of sensitivity analysis: Percent deviation of sensitivity analysis compared to standard simulation results (%)

Analysis #	Impact on activity levels	Impact on the value of net agricultural production	Impact on net non-farm income	Impact on ranking of household cash-balances
1	None	-4 to -6 *	none	none
2	None	-7 to -12 *	none	Cash balance decreases in farm development scenario below the cash balances of the early retirement scenario
3	None	None	-3 **	none
4	None	None	+3 to +4 **	none
5	None	None	-0 to -4 ***	none
6	None	None	+1 to +5 ***	none

Note: *: impact only in scenarios in which labour is allocated to the farming activity; **: impact only in scenarios in which labour is allocated to the self-employment activity; ***: impact only in scenarios in which labour is allocated to the dependent employment activity

Source: Own simulation results with data from project survey.

changes in activity levels. However, there were impacts on net agricultural production and net non-farm income. This also affects the resulting household cash balances, but does not change the ranking of the strategies except in analysis #2. In this case, early retirement results in a higher cash balance than farm development, which was not the case before. Moreover, the increased operational costs of farming result in a lower value of net agricultural production by up to -12%.

The effect of lower or higher operational costs of non-farm income activities is straightforward: when operational costs are higher, net income from non-farm income activities decreases marginally by no more than 5% and *vice versa*.

The findings show that the key outcomes of the model results for the Polish rural newcomer household are stable within a 10% variation of operational costs per unit dependent employment and self-employment and are stable within a 15% increase of operational costs per unit farming.

8.5 Summary of Simulation Results

The simulations show that seeking to “continuing as at present” results in non-viability for rural pensioners after ten years with this strategy – regardless of the survey country. Nevertheless, it seems to be a feasible strategy for all other SFH types in Poland and Bulgaria. In Romania, only rural diversifiers are better off by continuing their current income activities, and yet for this type of SFH, the household cash balance remains negative. For all types of SFH except Romanian rural newcomers, farm development is a sensible option. Developing another non-farm self-employed form of business seems favourable only for all simulated Bulgarian households as well as for Romanian rural diversifiers, rural pensioners, and rural newcomers. It would worsen household cash balances for all Polish SFHs and Romanian ‘farmers’. However, setting up a non-farm business is a challenging task that only a few households could manage and cannot

be considered a universal remedy for SFHs. The early retirement scheme was an attractive way of sustaining viability only for Polish rural diversifiers, Bulgarian rural pensioners and Polish rural newcomers. However, most rural pensioners and rural newcomers will not be eligible for early retirement. For all other SFH types, this strategy would worsen the cash balance situation relative to the baseline scenario.

In most of the scenarios, transitional semi-subsistence support increases the household cash balance by the net return that is earned from its investment. By its very nature, this amount can only be small. Nonetheless, there are some interesting conditions that could cause a deeper impact of the payment in the diversification scenarios, by influencing the allocation of household labour to the activities. In a few cases, however, signing up for the transitional semi-subsistence support worsens the household’s position. This is due to the associated constraint that requires the recipient household to increase the economic size of the farm, which may distract households that opt for this measure away from more profitable non-farm activities.

The strategies resulting in the highest household cash balances for rural diversifiers are starting a non-farm self-employed activity and farm development. Polish rural diversifiers are an exception to this general rule. For them, early retirement and farm development result in the highest cash balances. Most rural pensioners do not attain viability in any of the simulated decision scenarios. Hence, how SFHs of this type could improve their precarious situation remains a major question. Simulation results show that the SFH type ‘farmers’ progresses best under the farm development scenario, which results in the highest cash balances as compared to the other scenarios. Alternatively, “continuing as at present” is also a feasible option for them. For rural newcomer households, starting a non-farm self-employed activity and farm development are the strategies that provide the highest cash balances. However, the results are different for the simulated Polish rural newcomer household. The

Polish household achieves the highest cash balance in the farm development scenario, while starting self-employment would result in the most negative household cash balance. Furthermore, the low educational level of rural newcomer households makes the already challenging option of starting a non farm self-employed activity even less attractive.

Sensitivity analyses were carried out for the Polish rural newcomer household and the

critical parameter operational costs. Given the very limited extent of these analyses, they cannot be generalised and should be considered as illustrative only. Having said this, the analyses show that the key outcomes of the model results for the Polish rural newcomer household are stable for a 10% variation in operational costs per unit dependent employment and self-employment, and are stable for a 15% increase in operational costs per unit farming.

■ 9 Summary, Important Findings, Conclusion and Policy Recommendations

Farming households in CEE, and especially SFHs, have to make many decisions relating to their income-generating activities. SFHs are often unprofitable from a farm business perspective, and yet they have persevered. Not all the reasons for their persistence are understood yet, but it is generally agreed that such households have been important in providing food and shelter during economic disruptions during the transition period for both resident families and even urban-based relatives. SFHs make up the majority of farms in the NMS of the EU and, according to Pouliquen (2001) referring to the late 1990s, were responsible for at least 50% of total agricultural production.

There is an ongoing debate about what would encourage SFHs to become more profitable, which comparative financial data shows is possible, or to leave farming. When making policies that target farm households in this category, the multitude of factors that influence their decision-making, or at least the most important of these factors, should be taken into account. For instance, policy support to agriculture and rural development in general may have different effects according to the various characteristics of the SFH, in particular the relative importance of on-farm income from subsistence and commercialisation versus non-farm income from non-farm activities and unearned income. Reliance on family labour use for own-produced food and shelter becomes less feasible without fairly major changes when expectations of rising living standards increase cash needs. Many of these changes will involve labour leaving farms, especially young people, e.g. for higher levels of education.

In all three case-study countries, namely Poland, Romania, and Bulgaria, agriculture has played an important role as a social buffer during the transition process. In Romania and Bulgaria, land privatisation led to a dual structure

in agriculture consisting of, on the one hand, small and mostly semi-subsistence farms and, on the other, large commercialised farms that can exploit economies of scale and apply modern technologies. It seems that the CAP mostly benefits the latter type of agricultural producer, leaving a significant number of rural residents to cope with their situation on their own. In the enlargement process of the European Union, a special transitional semi-subsistence measure was introduced to promote development of the smallest agricultural producers into commercialised private farms.

Historical experience regarding farm restructuring in the old EU Member States suggests that only a small share of semi-subsistence farms in the NMS can be expected to grow to a commercially viable and socio-economically sustainable size (EC 2004). This implies that many of these farms will either remain in a non-viable state or will cease farming. Therefore, one of the key questions when formulating EU rural development policy concerns how semi-subsistence farms can be approached most effectively in order to facilitate this restructuring process, whilst avoiding the more negative consequences.

9.1 Summary of S-FARM Objectives and Methodologies

Objectives

In light of the above, the European Commission asked JRC-IPTS to carry out a socio-economic analysis of SFHs in Poland, Romania, and Bulgaria and to analyse the impact of EU rural development policy on SFHs. In spring 2007, IPTS launched the S-FARM project, which has resulted in this study. Due to the complexity

of semi-subsistence farming and its particular form in these countries, the study has pursued several research questions.

First, a typology of SFHs was constructed in order to permit a realistic description of the phenomenon of semi-subsistence farming. This typology identifies different household types, which are categorised according to household and farm characteristics. For each household type, household behaviour and institutional environment characteristics are described. Second, the viability of SFHs given their current productivity and socio-economic environment was analysed. In particular, the extent to which social and policy transfers play a role in maintaining the viability was examined. Third, it was of special interest to study the effect of the transitional semi-subsistence measure on SFHs. The degree of SFHs' awareness of this measure, whether they have already participated or whether they intend to apply for it in future was studied. Finally, the future viability of SFHs was investigated.

Methodology

A major issue of the S-FARM study was to establish a cross-country data base consisting of relevant primary SFH data. To this end, SFHs in each of the three case countries Bulgaria, Poland, and Romania were interviewed face-to-face using a standardised in-depth questionnaire. The surveys were conducted in two regions in each country: (i) Świętokrzyski and Poznański in Poland, (ii) Timis and Dolj in Romania, and (iii) North-West and North-Centre in Bulgaria. At least ten villages were selected within each region. Due to different conditions regarding data availability in the three countries, slightly different selection procedures were applied but care was taken to ensure that the variation in the selection procedure did not inhibit cross-country statistical analyses.

The surveys were conducted from July to September 2007. Reliable and precise information on SFHs is sparse. As these farming households are usually not registered as such in any relevant database, it was difficult to identify appropriate

households for a survey. In each village, the aim was to interview eight to ten SFHs face-to-face. As a working definition for selecting households, a semi-subsistence farm household is defined as an agricultural holding of 1-4 ESU that markets part of its agricultural production.

To identify types of SFH, the three country' samples were pooled into a single sample of 544 observations (175 from Poland, 184 from Romania, and 185 from Bulgaria). After excluding 55 outliers, the sample consisted of 489 observations (of which 158 households from Poland, 153 from Romania, and 178 households from Bulgaria). Cluster analysis was used in order to organise the sample into more homogeneous sub-groups, and four clearly defined household types were identified.

Twelve typical SFHs from the four SFH types underwent a second in-depth interview, in order to collect additional information that would permit the construction of a mathematical programming model for each of the 12 farms. Multi-objective linear programming (MOLP) was used to analyse the impact of selected rural development measures, available in the current RD programme, on each of these farms. The model represents three household income activities, i.e. farming, dependent employment, and self-employed activities and optimises the following four household objectives: (a) net agricultural production, (b) net non-farm income, (c) household's cash balance, and (d) agricultural labour input. The model assumes that households seek to maximise the first three objectives whilst trying to minimise the fourth.

Programming models follow neo-classical economic theory. Although this is a well-proven approach for larger-scale farms, it seems not fully appropriate for small-scale farm households like the ones in this study. Most SFHs show conservative behaviour and risk aversion, which are not reflected in pure neo-classical models. To overcome this shortcoming, constraints were placed on various variables and parameters in

order to reflect non-economic aims, such as the desire to “keep up family traditions”, “be rooted to the soil”, or “conserve the heritage”. Thus, each household was assigned its own tailor-made set of simulation parameters.⁶² These sets were intensively discussed with national and international experts, thereby combining the quantitative modelling technique with a qualitative experience-based approach.

The impact of policy measures was assessed by simulating different decision scenarios. Each simulated scenario corresponds to a different SFH development strategy, defined in terms of the household’s choice of a particular policy measure or set of measures. For each selected household, decision scenarios were calculated with specific combinations of the five policy measures: (i) Single Area Payment Scheme, (ii) transitional semi-subsistence measure, (iii) farm investment support for the modernisation of agricultural holdings, (iv) support for diversification into non-agricultural activities, and (v) early retirement payments.

The simulation horizon was 2016. Information from the FAPRI (2008) agricultural outlook and assessments from national experts were used to extrapolate base year data from 2006 to 2016.

A baseline scenario was calculated for each type of SFH in each country. The baseline scenario represents the situation in 2016, when the single farm payment is fully implemented, i.e. to 100% of the agreed level, in all three countries. In addition, it is assumed that no rural development measures are applied. Hence, the baseline scenario can be interpreted as the strategy “continue as at present”.

⁶² The simulation was done for one real existing household per SFH type and country because an analysis of inter-country differences within each SFH type showed that the households were significantly different with respect to a number of behavioural characteristics. Since these countries’ specifics may influence household responses to policy measures, they are respected in the simulation approach. The selected households represent their respective type in its most important features. Country-specific behaviour was considered as far as possible in the simulation assumptions and in the interpretation of the results.

Decision scenarios reflect different strategies on which a household of each SFH type could embark. The decision scenario “farm development” assumes that the household will invest in farming activities and receive corresponding support from policy measures. In the decision scenario “start self-employment”, it is assumed that the household starts a self-employed activity other than farming, receiving the respective support from policy measures. The decision scenario “farm development and start self-employment” assumes that the household both invests in farming and diversifies into self-employed activities. In the decision scenario “stop agriculture”, the farm household stops farming and receives early retirement payments. In addition, all decision scenarios that do not imply giving up the farming activity were calculated in two variants: (i) with and (ii) without transitional semi-subsistence support.

A comparison of the results of the decision scenarios with those of the baseline shows what the consequences would be if the SFH in question opted for the measure or combination of measures assumed in the corresponding scenario. The discussion focussed on the comparison of household cash balances resulting from the different decision scenarios, showing the additional effect of the transitional semi-subsistence support measure, and identifying which decision strategy would be the most beneficial option for each household type in the future.

9.2 Important Findings

The study comprises two parts, namely identification of SFH types and policy analysis. The cluster analysis identified four types of SFH: rural non-farm oriented households (‘rural diversifiers’, N=150), rural pensioners and deprived households (‘rural pensioners’, N=83), large-scale semi-subsistence farm households (‘farmers’, N=153), and rural households with undeveloped potential (‘rural newcomers’, N=103).

The SFH types identified are statistically distinct from each other and show clear differences with respect to household, farm and behavioural characteristics as well as regarding their external environment and viability.

Rural diversifiers are characterised by the highest share of non-farm net income in household net income and the highest level of formal schooling, which may well be a precondition for the non-farm employment. These households have the highest share of own-consumed agricultural production in total agricultural production. They also have the highest number of agricultural products as compared to other SFH types, which is not surprising since more subsistent households must produce a wider range of products to meet family's food demand. They also have a low share of social security benefits in net household income.

The **rural pensioners'** households are characterised by the oldest farm operators and the highest dependency ratio. These farm operators have many years of experience managing a farm but they have also the lowest level of agricultural qualifications and they operate the smallest farms. Moreover, they have the highest share of social security benefits in household net income, and the smallest share of non-farm net income.

Farmers operate the largest farms. They produce relatively more crop products than animal products and they are better integrated into the agricultural product market than other types of SFH. It is also worth mentioning that farmer households are the most well off of all SFH types, with the highest annual cash balance in 2006.

The heads of the **rural newcomer** households are the youngest and have very little experience in farm management. They had the smallest annual household cash balance in 2006 and their level of formal schooling is very low. There seems to be a lot of potential for improvement in their socio-economic situation.

Most of the households in the sample are not viable. Nevertheless, national experts considered that the stated figures for income were underestimated and those for expenditure overestimated, thus possibly drawing a more negative picture than existed in reality.

Policy analyses show that:

- (1) When the strategy of "continuing as at present", e.g. **no rural development measure is applied** (baseline scenario) is adopted, rural pensioner households, regardless of the survey country, will be worse off after ten years with this strategy. Nevertheless, it seems to be a feasible strategy for all other major types of SFHs in Poland and Bulgaria, as for them the cash balance increases relative to the actual cash balance in 2006. An exception is Romania, where only rural diversifiers are better off by continuing their current income activities, and yet even for this type of SFH, the household cash balance remains negative.
- (2) Rather than "continuing as at present", households could cease farming and apply for **early retirement** support. This strategy would worsen the cash balance situation for nearly all SFH types as compared to the baseline scenario. Only rural diversifiers and rural newcomers in Poland, as well as Bulgarian rural pensioners, could improve their situation by embarking on this strategy. However, due to the average age of the rural newcomers (35 years) and of the rural pensioners (65 years), the majority of SFHs belonging to these types are not eligible for the early retirement measure. Hence, early retirement can be considered as a feasible option for the Polish rural diversifiers only. All other simulated SFHs are either not eligible for early retirement or are not able to compensate by other income sources for the income loss from giving up farming.

- (3) An alternative strategy would be to **start a non-farm self-employed income activity**. This would be a favourable strategy for all simulated Bulgarian SFH types, while it would worsen household cash balances for all simulated Polish SFHs. In Romania, only farmers would be worse off when embarking on a diversification strategy. However, setting up a non-farm business is a challenging task that only a few households could manage. In particular, for rural pensioners, who are mostly elderly, and for rural newcomers, who on average have a low education level, setting up a family business hardly seems a feasible option. Thus, income diversification by means of self-employment cannot be considered a universal remedy for SFHs.
- (4) Besides keeping the current situation, early retirement, and starting a non-farm self-employed income activity, **farm development** seems to be a sound strategy for households already engaged in farming. Most of the simulated households could profit from a farm development strategy. The only exception is the SFH type of Romanian rural newcomers.
- (5) Simulation results show that the **transitional semi-subsistence support measure** does not have an impact on the allocation of individual household labour or the household's activity levels in all scenarios that imply farm development. In these scenarios, the effect of the measure was simply to increase the household cash balance by exactly the 100 EUR that was assumed in the model to be the net return from investing the payment in the farm. Hence, in most of the simulated scenarios, transitional semi-subsistence support increases households' cash balance by the profit that is gained from its investment.

As the transitional semi-subsistence measure is implemented in the countries with the condition the economic size of the farm should increase,

in all scenarios involving the semi-subsistence payment it was assumed in the model that the households have to maintain at least the level of farming that they had in 2006. This condition causes a deeper impact of the payment in the diversification scenarios, by influencing the allocation of household labour to the activities. In diversification scenarios without the semi-subsistence payment all households but the SFH type of farmers and the Bulgarian rural diversifiers allocate individual household labour from the farming activity to a non-farm activity as compared to the diversification scenario with the payment. This results in changes in households' cash balances that differ from the assumed net return of 100 EUR.

In cases when the household prefers non-farm activities but the income per working unit from farming exceeds the income from non-farm activities, the simulation results show a higher net surplus when the household is constrained to keep farming in diversification scenarios with semi-subsistence support. In those cases, the households are distracted from non-farm activities when participating in the measure and are kept in farming, which on the other hand results in higher cash balances. However, these households have rational reasons for the specific preferences for non-farm income and looking at the cash balance alone would not consider these reasons.

But the reverse situation could also be observed. When households participate in the measure whose income per working unit from farming is lower than the income from non-farm activities, the transitional semi-subsistence measure would retain in farming households or household resources that could otherwise earn a higher cash surplus outside agriculture.

- (6) The strategies resulting in the highest household cash balances for **rural diversifiers** are starting a non-farm self-employed activity

and farm development, while “continuing as at present” or early retirement would result in the lowest households’ cash balances. Polish rural diversifiers are an exception to this general rule. For them, early retirement and farm development provide the highest cash balances, whereas starting a self-employed activity outside agriculture is the only strategy that would lead to a negative cash balance.

- (7) **Rural pensioners** do not in general attain viability in any of the simulated decision scenarios. The only exceptions are the Bulgarian rural pensioner household, which becomes viable when embarking on early retirement or self-employment, and the Polish household, which earns a positive household cash balance through farm development. Moreover, farm development is the only strategy that increases the cash balance of all simulated rural pensioner households. However, given the high average age of rural pensioners (a median age of 65 years) and their difficult income situation, farm development or starting a family business would possibly be too demanding for most households of this SFH type. Moreover, most rural pensioner households are not eligible for the early retirement measure because they are over the age limit. Hence, how SFHs of this type could improve their precarious situation remains a major question.
- (8) Simulation results show that the SFH type of **farmers** progress best under the farm development scenario which results in the highest cash balances as compared to the other scenarios. Alternatively “continuing as at present” is also a feasible option, whereas early retirement results in the lowest cash balances.
- (9) For **rural newcomers**, starting a non-farm self-employed activity and farm development are the strategies that provide the highest households’ cash balances while “continue as at present” and early retirement result

in the lowest cash balances. However, the results are different for the simulated Polish rural newcomer household. The Polish household achieves the highest cash balance in the farm development scenario and the second best positive cash balance under an early retirement scheme. Starting self-employment would result in the most negative households’ cash balance out of all strategies for the Polish SFH. As the average age of rural newcomers is low (35 years), the majority of households of this type are not eligible for the early retirement measure. Furthermore, the low educational level of rural newcomers hampers the already challenging option of starting a non farm self-employed activity.

9.3 Conclusion and Policy Recommendations

The following is a summary of policy recommendations derived from the above findings.

Rural diversifiers and pensioners – Sectoral policies may be less appropriate than social policies

Rural diversifiers are not doing very well, but they earn enough income from waged employment and farming to support themselves. As they tend to be relatively well educated, it is reasonable to assume that this SFH type can keep its *status quo* until retirement, particularly because retirement is close for the majority (average age of 54 years). The recommendation would be to leave them alone but prepare the way for them to enjoy a poverty-free retirement.

Rural pensioners were found to be non-viable under most policy scenarios. Given their high average age, a well functioning and adequate social security system seems to be most beneficial for them. As they display mostly a negative cash balance, the pensions would not only have to keep pace with economic growth in

terms of average percentage growth but also to start at level comparable with that of other retired groups, and not with that of their own most recent income levels.

Farmers and rural newcomers - Sectoral policy measures and improving employability may succeed.

SFHs classified as **farmers** have the highest development potential. Even now, without additional policy measures, these households are mostly in a relatively good situation. Nevertheless, the farm investment measure could help them grow and prosper further. Since the average age of farm owners is quite high (50 years), for this type of households the question of how to make the farm attractive to a potential successor and/or pension programme are also important issues to be addressed. Overall, sectoral policy measures can greatly benefit this type of SFH.

The group **rural newcomers** should also be the target of policy measures. They are relatively young but lack professional training in farming activities and in the non-farm sector, thus their employability is rather limited. If they continue as at present, their socio-economic situation will further degrade. It would be in their best interest, on the one hand, to improve their employability in the non-farm labour market. On the other hand, to become capable of operating a farm economically successfully, they need advice on investment and production strategies as well as marketing ideas.

One-size-fits-all versus customised measures?

Our simulations show that farm development results in higher cash balances for most SFHs. Early retirement is the least favourable strategy due to the lack of other income sources that might compensate for losses incurred by giving up farming. Starting a **self-employed activity** would also be a good option in terms of income; however, only a few SFHs may be in a position to take up this opportunity because, firstly, the

formal rural credit market is reluctant to lend to farmers for non-farm activities and, secondly, SFHs' access to output markets related to self-employed activities is constrained.

When the formal credit market is reluctant to lend to apparently unattractive market segments such as small-scale entrepreneurs in the farm or non-farm sector, **microcredit** has, since the late 1990s, been seen as a panacea. It is, however, very doubtful whether the existing microcredit suppliers in these case-study countries can actually fill the credit gap in the short run. Empirical findings as to the effect of microcredit access on the income situation of recipients are mixed. However, it is safe to say that microcredit can boost economic activity if the institutional environment and the overall market conditions are favourable.

There are high expectations connected with the **transitional semi-subsistence measure**. This measure includes the obligation to increase farm size by 3 ESU within three years in Romania and five years in Bulgaria. In Poland, farmers only have to provide a simple business plan and prove that they implemented actions from the business plan to be considered under the transitional semi-subsistence measure. However, the marginal productivity gained from invested semi-subsistence support can, by its very nature, only be low. Simulation results show that a small return from the transitional semi-subsistence support does not significantly change the cash balances of most households.

Farm development and embarking on a non-farm (self-employment and waged) income activity are the strategies that seem to be most promising for SFHs in the future. If the policy goal is restructuring the agricultural semi-subsistence sector, it requires a broader-based effort. The findings of this study suggest that the transitional semi-subsistence measure on its own is insufficient. Given the importance of non-farm employment for many of the people concerned (particularly rural diversifiers and rural newcomers), the development of the

rural economy at large is important. Similarly, the adequacy and relevance of **national pension and social security systems** may also be worth a review, as many owners of SFHs are already in their sixties or not far from this age. Access to agricultural support programmes is available to them, as shown in relevant documentation, but not as easy as for larger farmers which should be recognised in all aspects of the administration of these programmes. Hence, establishing social safety nets and facilitating exit options from farming are crucial (Hazell *et al.* 2007). Moreover, establishing good general economic conditions, providing hard infrastructure, information services, encouraging farmers to follow the demand, and improving marketing systems are further approaches to foster farm development and growth.

As soon as SFHs start to grow and their agricultural output increases, the question arises how they **could market their surplus**. The S-FARM study results show that rural diversifiers and rural pensioners use more than two thirds of their production for their own household consumption and intermediate farm inputs. They are not reliable suppliers for traders and processors, and they are unlikely to get involved in a modern market system. This is not necessarily a problem for them because they produce primarily for their own consumption and thus market access is not of high priority. But things are different for the farmers and the rural newcomers. They seem to be interested in supplying the output markets with reliable quantities of goods. But even they may find themselves confronted with market realities that are decided by global agri-food chains. The phenomenon of agri-food chains has gained much prominence in recent years. Recent research is unanimous in finding that agri-food chains prefer contracting with large-scale agricultural producers. Only when large-scale producers are virtually absent from the market do they start to support small-scale farmers in adapting to their quality and quantity requirements (Dries and Swinnen 2004, Dries *et al.* 2007, Reardon and Swinnen 2004). These support programmes are very efficient, but they

are only launched when no other supply option is available. It may be concluded that SFHs in Poland, Romania, and Bulgaria are in general too small to participate in such programmes. There may be a chance for farms that focus on highly specialised and very labour-intensive products like soft fruits or herbs. But this will remain a niche market for a very small number of farms.

SFHs may benefit from **producer organisations** and **co-operatives**. Our results show that although membership in formal organisations in general, and producer and market organisations in particular, is not widespread, there are nevertheless household members who are or are willing to become members. But again there is a difference in the current network density between the different SFH types. The greatest integration into networks was observed for farmers. They are more likely to co-operate with other small- and large-scale farmers and are more often members of formal organisations. By contrast, rural pensioners make use less often of co-operatives and formal organisations. When looking at the willingness to become organised, data show that more than 10% of households are interested in becoming members in marketing or producer organisations. Nevertheless, it may be assumed that it will be primarily the households seeking farm development that will become organised. Membership in organisations is, at the least, time-consuming and tangible benefits from membership may be difficult to obtain when the marketed quantities are low. As for the organisations, the natural question is why they should deal with many very small suppliers, which increases transaction costs but does not significantly increase the organisation's market power.

It seems most likely that efforts to add to the **human capital** of the households concerned is likely to have the greatest long-term net social payoff. Farm households with greater levels of skill are likely to farm better and be better able to develop their farms and other businesses. Educated family members are more likely to be able to compete in the job market. Improving the

employability of household members should be a key objective of social policy and labour market policy. Information gathered during surveys shows that the people concerned have few resources, which is the main reason for their low and

uncertain cash positions. From a national point of view, adding to the capital assets they command by means of education is likely to be not only the most feasible option available but also the most profitable one in the medium-term.

■ 10 References

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Abbreviations and Acronyms

base	Baseline scenario
BG	Bulgaria
BGN	Bulgarian Lev, 1 BGN=0.51387 EUR in 2006 (OANDA 2007)
dca	Decar (equal to 1,000 square metre or 0.1 ha)
dt	100 kilogramme
ESSQ	Error Sum of Squares
ESU	European Size Unit, 1 ESU=1,200 EUR standard gross margin
EU	European Union
EUR	Euro
FAPRI	Food and Agricultural Policy Research Institute
farm	Farm development without semi-subsistence support
farm+self	Farm development and start self-employment without semi-subsistence support
farm+self+tss	Farm development and start self-employment with semi-subsistence support
farm+tss	Farm development with semi-subsistence support
ha	Hectare
IAMO	Leibniz Institute of Agricultural Development in Central and Eastern Europe
IPTS	Institute for Prospective Technological Studies
km	Kilometre
l	Litre
LFA	Less-favoured areas
LU	Labour units
NC	National currency
No.	Number
P25	25th percentile
P5	5th percentile
P75	75th percentile
P95	95th percentile
PL	Poland
PLN	Polish Złoty, 1 PLN=0.2575 EUR in 2006 (OANDA 2007)
retire	Early retirement
RO	Romania
ROL	Romanian New Lei, 1 ROL=0.2848 EUR in 2006 (OANDA 2007)
SAPS	Single Area Payment Scheme
self	Start self-employment without semi-subsistence support
self+tss	Start self-employment with semi-subsistence support
SFH	Semi-subsistence Farm Household
UAA	Utilised Agricultural Area
USD	US Dollar

■ Annex 1: Statistical Methodology

Cluster Analysis

Cluster analysis is a statistical method that allocates observations (e.g. farms households) from a sample into groups (“clusters”) that can be considered internally homogeneous, but clearly distinct from each other (see, for example, Hair et al., 2006). The various procedures are either hierarchical or non-hierarchical procedures. Hierarchical procedures yield a tree-like graph (dendrogram) showing how the clusters are formed and which farms belong to which cluster. Hierarchical procedures do not provide a single solution, but give the user a set of possible solutions consisting of different numbers of clusters. Users can select the solution that suits their problem best. Two approaches are distinguished for hierarchical procedures: agglomerative methods and divisive methods. Agglomerative methods start with a set of N farms and, proceeding step by step using a numerical algorithm, join the most similar farms or clusters to form a smaller number of clusters, ending with one cluster that involves all farms. Divisive methods operate in the opposite way. They start with one cluster involving all farms and split this cluster step by step so that in the end there are N single farms.

Non-hierarchical procedures provide only one solution. They build clusters around a set of starting points (so-called cluster seeds). The user specifies the desired number of clusters in the solution a priori when choosing the number of seed. Four clusters will be formed when four cluster seeds are specified.

It is common to use a combination of both methods. A hierarchical agglomerative method is used first to select the number of clusters, whose composition is then refined with a non-hierarchical method. Agglomerative methods use a combination of distance measure and agglomeration algorithms. The most important distance measures for metric scaled-variables mentioned in the literature are: Mahalanobis distance, (squared) Euclidean distance, City-block metric, and correlation coefficient. Agglomeration algorithms that are usually available in standard software packages are: single linkage, average linkage, and complete linkage. Ward’s method, which uses error sum of squares and squared Euclidean distances for building up homogeneous groups, is a special case. Each combination of distance measure and agglomeration method may yield different results for the same data set and much research has been performed to find the most effective combination. Usually, the user is advised to try different combinations and to select the one that gives the most appropriate results.

In this study, no comparison of cluster methods was made. Our objective was to provide a solution where the clusters of farms are clearly separated from each other while the farms within a cluster should be as similar as possible. Ward’s method meets these requirements best and was therefore adopted for this study. Various indicators measuring household and farm characteristics (Annex 3, Table A2-A6) were used as variables. All variables were standardised before performing the cluster analysis.

A precondition for cluster analysis is that the variables used should be uncorrelated. Correlated variables act as weights in the clustering process, e.g. one attribute could be considered three times due to three correlated variables, while others are considered only once. This causes solutions to be biased in favour of the correlated variables (Hair et al. 2006). There are three ways of dealing with correlations in the dataset. The first is to use the Mahalanobis distance measure, which considers the correlations in the

calculation of distances (Aldenderfer and Blashfield 1984). It could not be used in this study since it is not implemented in SPSS. The second way is to exclude correlated variables from the analysis. Here the issue is how to distinguish correlated variables from uncorrelated ones. Hübler (1989) suggested considering variables with a correlation coefficient greater than 0.8 as correlated. The third option is to perform a factor analysis and replace the variable values by factor scores. One problem with this procedure is that “variables that truly discriminate among the underlying groups are not well represented in most factor solutions” (Hair et al. 2006, p. 582). Another problem lies in the interpretation of factor scores that are linear combinations of all variable values and do not have representations in the real world.

The following recommendation to deal with correlated variables was followed: first, examine all pairwise correlations (using Pearson’s correlation coefficient; second, if there are only a few correlations greater than 0.8, exclude the variables involved; if there are many highly correlated variables, then perform a factor analysis first and use the factor scores in cluster analysis instead of the original variables.

One drawback of hierarchical cluster methods is that they do not reallocate the farms during the clustering process. At a certain point within the cluster process, it could happen that a farm that was allocated to a certain cluster some steps before would be better allocated to another cluster subsequently. As this is not done automatically during clustering, the clusters may not be as clearly separated as required for further analysis. To remedy this, the *k*-means, a non-hierarchical clustering procedure was used in a second stage. The combination of the hierarchical cluster method with *k*-means has been successfully applied on rural households, for example in Jansen et al. (2006), Petrocivi and Gorton (2005), and Chaplin et al. (2007). In the following text, the two cluster methods Ward’s method and *k*-means are described.

Ward’s Method

Ward’s method is a hierarchical agglomerative procedure. Instead of using the distances between the SFHs for building up clusters, it uses the error sum of squares (*ESSQ*) within the potential new cluster. Two clusters are joined when the increase in the *ESSQ* of the new cluster is the smallest among all other possible options.

Equation A 1: Error sum of squares (*ESSQ*)

$$ESSQ_{ij} = n_i \times d_i + n_j \times d_j$$

Source: Deichsel and Trampisch (1985).

The error sum of squares $ESSQ_{ij}$ between clusters *i* and *j* is calculated as the sum of the products of the numbers n_i and n_j of SFHs in the original clusters and the distances d_i and d_j of the centroids of the original clusters to the centroid of the new cluster. The centroid of a cluster is defined as the arithmetic mean for all variables and SFHs within the cluster.

The squared Euclidean distance between the clusters *i* and *j*, calculated as the sum over all squared distances for all *p* variable values (Equation A 2), is used as distance measure.

Equation A 2: Squared Euclidean distance

$$d_{ij} = \sum_{k=1}^p (x_{ik} - x_{jk})^2$$

Source: Aldenderfer and Blashfield (1984).

K-means

K-means is a non-hierarchical iterative procedure. It forms a given number of clusters around specified starting points, so-called seeds. In this study, the arithmetic means for all variables within each cluster taken from Ward's method were used as seeds (Hair et al. 2006). In the next step, the Euclidean distances (Equation A 3) of all SFHs to the various seeds are computed. A farm will be allocated to the cluster to whose centroid it is closest. Then, new cluster centroids are calculated out of the variable values of all farms within the new clusters and the farms are assigned to the clusters again. This process stops when the cluster centroids no longer change remarkably or a specified number of iterations have been completed (SPSS 2006b).

Equation A 3: Euclidean distance

$$d_{ij} = \sqrt{\sum_{k=1}^p (x_{ik} - x_{jk})^2}$$

Source: Aldenderfer and Blashfield (1984).

The Euclidean distance between the centroid of cluster i and SFH j is calculated as the squared root of the sum over all squared distances for the p variable values of SFH j and the cluster centroid i .

Chi² Test

Based on observed frequencies in a contingency table (Table A 1) the Chi² statistic is calculated according to Equation A 4.

Table A 1: General structure of a contingency table

		Variable 2			
Variable 2	Category 1	Category 2	...	Category n	Sum
Category 1	n_{11}	n_{12}	...	n_{1n}	$n_{1.}$
Category 2	n_{21}	n_{22}	...	n_{2n}	$n_{2.}$
...
Category m	n_{m1}	n_{m2}	...	n_{mn}	$n_{m.}$
Sum	$n_{.1}$	$n_{.2}$...	$n_{.n}$	$n_{..}$

Source: Simonoff (2003).

N_{ij} ($i=1..m$ and $j=1..n$) are observed absolute frequencies for the corresponding combination of variable categories. N_i and n_j are the sum of observations for the respective category over all categories of the other variable. $N_{..}$ is the total number of observations (sample size).

Equation A 4: Chi² test statistic

$$Chi^2 = \sum_{i=1}^m \sum_{j=1}^n \frac{(n_{ij} - e_{ij})^2}{e_{ij}},$$

$$e_{ij} = \frac{n_i \cdot n_j}{n_{..}},$$

$$df = (m-1)(n-1)$$

Source: Agresti (2002).

Chi² is the sum over all $m \cdot n$ cells in the contingency table for the squared differences between the observed frequencies n_{ij} and the expected ones e_{ij} divided by the expected frequencies e_{ij} . The expected frequency e_{ij} is the product of the respective row and column sum (n_i and n_j) divided by the sample size $n_{..}$. The Chi² statistic has $(m-1) \cdot (n-1)$ degrees of freedom (df).

A p -value that is smaller than 0.05 indicates that association between the two variables is rejected at the 5% significance level.

Kruskal-Wallis Test

The Kruskal-Wallis test was also used to test that the clusters are different from each other. This test is performed for each indicator variable. In the first step, the clusters are pooled and the original values of the indicator variable are sorted and replaced by their ranking in the pooled sample. In the case of tied scores (observations having the same values), the average rank is assigned to each observation. The test statistic (H) is calculated according to Equation A 5. N is the number of observations (total sample size), k the number of clusters (e.g. types of SFHs), n_j the number of observations in cluster j ($j=1..k$), and R_j the sum of all ranks in cluster j .

H_{corr} is the test statistic corrected for the number of ties in the sample. It is the unadjusted Kruskal-Wallis test statistic H divided by the correction term C . In the correction term, C stands for the number of sets of ties m and t_i ($i=1..m$) is the number of tied scores in set i . The degrees of freedom (df) are the number of categories (k) of the variable minus one.

Equation A 5: Test statistic for Kruskal-Wallis test

$$H_{corr} = \frac{H}{C}, \text{ where}$$

$$H = \frac{12}{N(N+1)} \sum_{j=1}^k \frac{R_j^2}{n_j} - 3(N+1), \quad C = 1 - \frac{\sum_{i=1}^m (t_i^3 - t_i)}{N^3 - N} \quad \text{and} \quad df = k - 1$$

Source: Bortz et al. (1990).

The Kruskal-Wallis statistic follows approximately a Chi² distribution with $k-1$ degrees of freedom. When the statistic is smaller than 0.05 the hypothesis that the groups' averages are different will be accepted.

■ Annex 2: Equations for Parameters Used in the Empirical Analysis

This Annex gives the equations for the indicators that were used for comparing between clusters and countries. The definitions and therefore also the equations are sometimes different from those used in the modelling approach. Therefore, different abbreviations for the various variables are used, e.g. household net income is denoted by *hh_net_income* in this chapter instead of *net_hh_income* as in the model.

Equation A 6: Share of net farm income in net household income

$$s_farm_net_inc = \frac{farm_net_inc}{hh_net_inc} * 100$$

$$farm_net_inc = o_agr_inc - aoc + \sum_{j=1}^n sale(j) * p(j)$$

$$hh_net_inc = farm_net_inc + self_net_inc + dep_net_inc + unearned_inc$$

$$self_net_inc = \sum_{i=1}^m self_gross_inc(i) - self_doc(i) - self_hired_lab(i)$$

$$dep_net_inc = \sum_{k=1}^o \sum_{l=1}^2 dep_gross_inc(k,l) - dep_doc(k,l)$$

$$unearned_inc = social_benefits + assets_inc + remitt_inc + agr_sub + o_sub$$

The share of net farm income (*s_farm_net_inc*) in net household income is calculated as the ratio of net farm income (*farm_net_inc*) to net household income (*hh_net_inc*) multiplied by 100.

Net farm income (*farm_net_inc*) is calculated as other agricultural income (*o_agr_inc*) minus agricultural operating costs (*aoc*) plus the sum over all *n* agricultural products⁶³ of sold quantity (*sale(j)*) multiplied by the price per unit (*p(j)*). Agricultural operating costs are calculated as the sum over all items in question 3.50 of the questionnaire. Other agricultural income is the sum of the figures in the questions 3.47 to 3.49.

Net household income (*hh_net_inc*) is the sum of net farm income (*farm_net_inc*), net income from self-employed activities (*self_net_inc*), net income from dependent work (*dep_net_inc*), and unearned income (*unearned_inc*).

Net income from self-employed activities (*self_net_inc*) is calculated as sum of gross income from *m* self-employed activities (*dep_gross_inc(i)*, *i=1..m*, question 5.4 of questionnaire) minus direct operational costs (*self_doc(i)*, question 5.7 of questionnaire) minus costs of hired labour (*self_hired_lab(i)*, questions 5.6.b and 5.6.c of questionnaire).

63 Set of agricultural products (*j=1..n*): wheat, corn, rye, other cereals, rape seed, sunflower, sugar beet, potatoes, soybeans, fodder beets, hay, other fodder, vegetables, fruits, wood, grapes, tobacco, milking cows, cattle ≤12 months, cattle >12 months, sows, piglets ≤25 kg, fattening pigs >25 kg, sheep, goats, layer hen, broiler, geese, ducks, turkey, rabbits, horses, bee hives, milk, butter, cheese and other milk products, meat products, eggs, wool, honey, hides, leather and fur, flour, wine, liquor, straw, manure

Net income from dependent work (dep_net_inc) is the gross income for all o household members engaged in up to 2 dependent employments ($dep_gross_inc(k,l)$, $k=1..o$, $l=1..2$, questions 6.8 and 6.16 of questionnaire) minus direct operational costs ($dep_doc(k,l)$, questions 6.9 and 6.17 of questionnaire).

Unearned income ($unearned_inc$) includes social security benefits ($social_benefits$, questions 7.14.a to g of questionnaire), income from assets and partnerships in cash or in kind ($assets_inc$, questions 7.17.a, b, d, e, f and bb, dd, ee, ff of questionnaire), remittances from absent household members, friends, etc. ($remitt_inc$, questions 7.12 and 7.13 of questionnaire), agricultural subsidies (agr_sub , sum of all subsidies from Section 4 of the questionnaire that the household received in 2006 excluding measures not directly related to agricultural production, i.e. development and diversification of economic activities, renovation and development of villages, and development and improvement of rural infrastructure), and other subsidies (o_sub , sum of all subsidies from Section 4 of the questionnaire that the household received in 2006 that are not directly related to agricultural production, i.e. development and diversification of economic activities, renovation and development of villages, and development and improvement of rural infrastructure).

Equation A 7: Share of net non-farm income in net household income

$$s_off_net_inc = \frac{self_net_inc + dep_net_inc}{hh_net_inc} * 100$$

The share of net non-farm income ($s_off_net_inc$) in net household income is calculated as the sum of net income from self-employed activities ($self_net_inc$) and dependent work (dep_net_inc) over net household income (hh_net_inc) multiplied by 100.

Equation A 8: Share of own-consumed agricultural production in household's total agricultural production

$$s_own_use = \frac{\sum_{j=1}^n own_use(j) * p(j)}{agr_prod} * 100$$

$$agr_prod = \sum_{j=1}^n prod(j) * p(j)$$

The share of own-consumed agricultural production in total agricultural production (s_own_use) is the ratio of the value of the own-consumed agricultural production to the value of the total agricultural production (agr_prod) times 100. The value of the household's consumed agricultural production is the sum over all n agricultural products of the quantities ($own_use(j)$, $j=1..n$, questions 3.16, 3.17, 3.18, 3.26, and 3.34 of questionnaire) times the corresponding product price ($p(j)$, questions 3.20, 3.28, and 3.36). The value of total agricultural production (agr_prod) is the sum over all n agricultural products for the produced quantities ($prod(j)$, $j=1..n$, questions 3.15, 3.25-3.24+3.26+3.27+3.29+3.30+3.31, 3.33) times the corresponding product price ($p(j)$, questions 3.20, 3.28, 3.36).

Equation A 9: Household cash balance

$$hh_cash_bal = hh_net_inc - hh_exp$$

The households' cash balance (hh_cash_bal) is the difference between net household income (hh_net_inc , see Equation A 6) and household expenditure (hh_exp , sum of expenditure mentioned in questions 8.1, 8.3 to 8.8 and 8.12).

Equation A 10: Economic farm size

$$farm_size = agr_prod - vc$$

Economic farm size (*farm_size*) is measured as total agricultural production (*agr_prod*, see Equation A8) minus net variable costs (*vc*, question 3.50 a+b+c+d+f+g+i).

Equation A 11: Share of crop production in total agricultural production

$$s_crop_prod = \frac{crop_prod}{agr_prod} * 100,$$

$$crop_prod = \sum_{q=1}^u crop_prod(q) * p(q).$$

The share of crop production in total agricultural production (*s_crop_prod*) is the ratio of crop production (*crop_prod*) to total agricultural production (*agr_prod*, see Equation A 8) times 100. Crop production (*crop_prod*) is the sum over all produced quantities for *u* crops⁶⁴ (*crop_prod(q)*, *q=1..u*, processed crop products are excluded, question 3.15 and 3.33 for straw) multiplied with their price (*p(q)*, question 3.20 and 3.36 for straw).

Equation A 12: Cost of purchased inputs for crop production per unit crop production

$$crop_int = \frac{b_cinp}{crop_prod}$$

The cost of purchased inputs for crop production per unit crop production (*crop_int*) is calculated as the value of all bought inputs for crop production (*b_cinp*, question 3.50 a+b+c) divided by the value of crop production (*crop_prod*, see Equation A 11).

Equation A 13: Cost of purchased inputs for animal production per unit animal production

$$anim_int = \frac{b_ainp}{anim_prod},$$

$$anim_prod = \sum_{r=1}^v anim_prod(r) * p(r).$$

The cost of purchased inputs for animal production per unit animal production (*anim_int*) is calculated as the value of all bought inputs for animal production (*b_ainp*, question 3.50 f+g+i) divided by the value of animal production (*anim_prod*). The value of animal production (*anim_prod*) is the sum of produced quantities of animal products⁶⁵ (*anim_prod(r)*, *r=1..v*, excluding processed animal products, questions 3.25-3.24+ 3.26+ 3.27+3.29+3.30 + 3.31, 3.33) times their price (*p(r)*, questions 3.28, 3.36) over all *v* animal products.

64 Set of crop products (*q=1..u*): wheat, corn, rye, other cereals, rape seed, sunflower, sugar beet, potatoes, soybeans, fodder beets, hay, other fodder, vegetables, fruits, wood, grapes, tobacco, straw

65 Set of livestock and animal products (*r=1..v*): milking cows, cattle ≤12 months, cattle >12 months, sows, piglets ≤25 kg, fattening pigs >25 kg, sheep, goats, layer hen, broiler, geese, ducks, turkey, rabbits, horses, bee hives, milk, eggs, wool, honey, hides, leather and fur, manure.

Equation A 14: Share of social security benefits in net household income

$$s_social = \frac{social_benefits}{hh_net_inc} * 100.$$

The share of social security benefits in net household income (s_social) is the ratio of the amount of social transfers ($social_benefits$, questions 7.14 a+b+c+d+e+f+g) to net household income (hh_net_inc , see Equation A 6) multiplied by 100.

Equation A 15: Share of the agricultural and other subsidies in net household income

$$s_subsid = \frac{agr_sub + o_sub}{hh_net_inc} * 100.$$

The share of agricultural and other subsidies in net household income (s_subsid) is calculated as the amount of subsidies received divided by net household income (hh_net_inc , see Equation A 6) multiplied by 100. The amount of subsidies received is the sum of agricultural subsidies (agr_sub , see Equation A 6) and other subsidies (o_sub , see Equation A 6).

Equation A 16: Viability considering net earned income

$$viability_earned_net_inc = \frac{earned_net_inc}{hh_liv_exp},$$

$$earned_net_inc = farm_net_inc + self_net_inc + dep_net_inc.$$

Viability considering net earned income ($viability_earned_net_income$) is the ratio of net earned income ($earned_net_inc$) to household living expenses (hh_liv_exp). A figure larger than or equal to 1 indicates that the household is viable, whereas a figure less than 1 signifies a non-viable household. The higher the figure, the more viable the household is.

Net earned income ($earned_net_inc$) is the sum of the three income positions net farm income ($farm_net_inc$), net income from self-employed activities ($self_net_inc$), net income from dependent work (dep_net_inc).

For household living expenses (hh_liv_exp), it is distinguished between household expenses as it is used in Equation A 9 and household living expenses for measuring viability. The latter excludes expenditure for jewellery and gifts (question 801), holidays (question 802), and financial support of other people (question 8.12) because these are not living expenses as such. The viability measure includes expenditure on loan repayments, and interest and contributions to insurances for farming and household's purposes.

Equation A 17: Viability considering net earned income plus received subsidies

$$viability_subsid = \frac{earned_net_inc + agr_sub + o_sub}{hh_liv_exp}.$$

Viability considering net earned income and received subsidies ($viability_subsid$) is measured as the ratio of net earned income ($earned_net_inc$, Equation A 16) plus agricultural subsidies (agr_sub , see Equation A 6) plus other subsidies (o_sub , see Equation A 6) to household living expenses (hh_liv_exp). A figure below 1 signifies a non-viable household. The higher the figure, the more viable the household is.

For household living expenses (*hh_liv_exp*), it is distinguished between household expenses as they are used in Equation A 9 and household living expenses for measuring viability. The latter excludes expenditure on jewellery and gifts (question 801), holidays (question 802), and financial support of other people (question 8.12) because these are not living expenses. The viability measure includes expenditure on loan repayments, and interest and insurance contributions for farming and household purposes.

Equation A 18: Viability considering net earned income plus received social security benefits

$$viability_social = \frac{earned_net_inc + social_benefits}{hh_liv_exp}$$

Viability considering net earned income and social security benefits (*viability_social*) is the ratio of net earned income (*earned_net_inc*, see Equation A 16) plus social security benefits (*social_benefits*, see Equation A 14) to household living expenses (*hh_liv_exp*). A figure larger than or equal to 1 indicates that the household is viable, whereas a figure less than 1 signifies a non-viable household. The higher the figure, the more viable the household is.

For household living expenses (*hh_liv_exp*), it is distinguished between household expenses as they are used in Equation A 9 and household living expenses for measuring viability. The latter excludes expenditure on jewellery and gifts (question 801), holidays (question 802), and financial support of other people (question 8.12) because these are not living expenses. The viability measure includes expenditure on loan repayments, and interest and insurance contributions for farming and household purposes.

Equation A 19: Viability considering net household income

$$viability_hh_net_inc = \frac{hh_net_inc}{hh_liv_exp}$$

Viability considering net household income (*viability_hh_net_inc*) is measured as the ratio of net household income (*hh_net_inc*, see Equation A 6) and household's living expenses (*hh_liv_exp*). A figure greater than or equal to 1 means that the respective household is viable, whereas a figure smaller than 1 signifies a non-viable household. The higher the figure, the more viable the household is.

A distinction is made between household expenses as they are used in Equation A 9 and household living expenses. The latter excludes expenditure on jewellery and gifts (question 801), holidays (question 802), and financial support of other people (question 8.12) because these are not living expenses. The viability measure includes expenditure on loan repayments, and interest and insurance contributions for farming and household purposes.

■ Annex 3: Case Country and Inter-case Country Comparisons of SFHs' Characteristics

This Annex provides the descriptive statistics for the four SFH types. The characteristics are grouped under four main headings:

1. Household characteristics (variables listed in Table A 2),
2. Farm characteristics (variables listed in Table A 3),
3. Behavioural characteristics (variables listed in Table A 4),
4. Characteristics of the external environment (variables listed in Table A 5), and
5. Viability (variables listed in Table A 6).

Table A 2 to Table A 6 list the variables that were used to define the profiles of the SFH types and their socio-economic environment. Variables that were also used in the cluster analysis appear in bold type.

■ *Table A 2: Household characteristics of SFH types*

1. Ratio of household members older than 64 years and younger than 16 years relative to household members aged from 16 to 64 years old (dependency ratio)
2. Highest formal schooling in the household (scale)
3. Agricultural qualification of farm operator (scale)
4. Age of farm operator (years)
5. Farm operator's experience as farm manager (years)
6. Share of net non-farm income (self-employment plus dependent employment) in household net income (per cent, Equation A 7)
7. Share of own-consumed agricultural production in total agricultural production (per cent, Equation A 8)
8. Household's cash balance (EUR, Equation A 9)
9. Gender of household head (binary scale)
10. Household net income (EUR)
11. Share of farm net income in household net income (per cent, Equation A 6)
12. Farm net income (EUR)
13. Net non-farm income (self-employment plus dependent employment, EUR)
14. Income from assets and remittances (EUR)
15. Costs of non-farm income activities (self-employment plus dependent employment, EUR)
16. Household living expenditure as used for calculating the viability measures in Equation A 16 to Equation A 19 (EUR)
17. Household expenditure as used for calculating household cash balance in Equation A 9 (EUR)
18. Loan repayments (EUR)
19. Number of rooms in the household residential house (number)
20. Number of household members (number)
21. Number of dependent household members (number)

Source: Own table.

Table A 3: Farm characteristics of SFH types

22. Economic farm size (EUR, Equation A 10)
23. Cultivated agricultural area per household (ha)
24. Share of crop production in total agricultural production (per cent, Equation A 11)
25. Number of agricultural products (number)
26. Costs of purchased inputs for crop production per unit crop production (ratio, Equation A 12)
27. Cost of purchased inputs for animal production per unit animal production (ratio, Equation A 13)
28. Variable costs of agricultural production as defined for Equation A10 (EUR)
29. Other costs related to farming (agricultural operating costs as defined for Equation A 6 minus variable costs of agricultural production as defined for Equation A 10, EUR)
30. Quality of land (scale)
31. Corn yield (dt/ha)
32. Wheat yield (dt/ha)
33. Milk yield (l/dairy cow)

Source: Own table.

Table A 4: Behavioural characteristics of SFH types

34. Importance of maximising agricultural net production (points)
35. Importance of maximising non-farm income (points)
36. Importance of maximising household's income (points)
37. Importance of maximising annual cash balance (points)
38. Importance of minimising agricultural labour input (points)
39. Aim: Diversify income sources (scale)
40. Aim: Be rooted to the soil (scale)
41. Aim: Enjoy rural lifestyle (scale)
42. Aim: Be respected in the village (scale)
43. Aim: Conserve the heritage (scale)
44. Aim: Keep up the family's traditions (scale)
45. Aim: Provide for the next generation (scale)
46. Aim: Provide children with a good/higher education (scale)
47. Aim: Avoid taking advances (scale)
48. Aim: Have time for leisure activities (scale)
49. Relations to fellow small-scale farmers, large-scale private farmers, and corporate farms (scale)
50. Participation in co-operation with fellow small-scale farmers, large-scale private farmers, and corporate farms (scale)
51. Frequency of co-operation with fellow small-scale farmers, large-scale private farmers, and corporate farms (number)
52. Formality of co-operation with fellow small-scale farmers, large-scale private farmers, and corporate farms (scale)
53. Membership in ten formal organisations (scale)
54. Willingness to participate in ten formal organisations (scale)
55. Future intentions of the household concerning the farm (percentage of households in the respective categories)
56. Importance of not having a successor for the farm in the decision to stop or reduce farming activities (percentage of households in the respective categories)
57. Knowing the transitional semi-subsistence measure (percentage of households in the respective category)
58. Application for the transitional semi-subsistence measure in 2006 (percentage of households in the respective category)
59. Receiving transitional semi-subsistence support in 2006 (percentage of households in the respective category)
60. Intended future application for the transitional semi-subsistence measure (percentage of households in the respective categories)

Source: Own table.

Table A 5: Characteristics of the external environment of SFH types

61. Distances to various infrastructural facilities (km)
62. Mobile retail shops coming to the village (scale)
63. Frequency of going to the next big urban centre (usually the district town) by public transport system (number)
64. Time needed to go to the next big urban centre by public transport system (minutes)
65. Time needed to go to the next big urban centre by car (minutes)
66. Share of social security benefits in net household income (per cent, Equation A 14)
67. Amount of received social security benefits (EUR)
68. Share of agricultural and other subsidies in net household income (per cent, Equation A 15)
69. Amount of received agricultural and other subsidies (EUR)

Source: Own table.

Table A 6: Measures used to describe viability of SFH types

70. Viability considering earned net income (ratio, Equation A 16)
71. Viability considering earned net income plus received subsidies (ratio, Equation A 17)
72. Viability considering earned net income plus received social security benefits (ratio, Equation A 18)
73. Viability considering household net income (ratio, Equation A 19)

Source: Own table.

Each SFH type is described in the main text (Chapter 5). However, in that text, not all variables are commented on for all SFH types but only where their values are of interest. Thus, a large volume of information is condensed into a set of succinct profiles. In this annex, Table A 7 to Table A 21 provide the full set of results. The median⁶⁶, the 5th percentile⁶⁷ (P5), the 95th percentile⁶⁸ (P95), the mean rank in the Kruskal-Wallis test, and the number of valid observations for the four major types of SFHs and the whole sample, as well as the results of comparisons of means (Kruskal-Wallis test⁶⁹) are given. For binary and nominal scaled variables, the tables show the percentage of observations in the respective category in the column for the median value, the number of observations in the respective category, and the result of the Chi² ⁷⁰ test. The columns for percentiles and mean ranks were left empty.

66 The median value is for non-normal distributed or ordinal scaled variables a more representative measure of the average level than the arithmetic mean.

67 The 5th percentile is the value below which 5% of the households fall.

68 The 95th percentile is the value below which 95% of the households fall.

69 The Kruskal-Wallis test is a non-parametric test for differences between group means when the variable of interest is not normally distributed (see Annex 1).

70 A description of the Chi² test is given in Annex 1.

Table A 7: Household characteristics by SFH type

	P ₅ ¹⁾	Median	P ₉₅ ²⁾	N	Mean rank/Sig. ³⁾
1. Dependency ratio (ratio)					
Rural diversifiers	0.0	0.00	1.00	150	209.71
Rural pensioners	0.0	1.00	3.00	83	332.07
Farmers	0.0	0.00	1.50	153	224.31
Rural newcomers	0.0	0.33	1.90	103	256.97
Sample	0.0	0.33	2.00	489	***
2. Highest formal schooling in the household (scale) ⁴⁾					
Rural diversifiers	4.0	5.0	7.0	150	337.96
Rural pensioners	2.0	4.0	6.0	83	212.25
Farmers	2.0	4.0	6.0	153	207.68
Rural newcomers	2.0	4.0	6.0	103	191.45
Sample	2.0	4.0	6.0	489	***
3. Agricultural qualification of farm operator (scale) ⁵⁾					
Rural diversifiers	1.0	1.0	5.0	150	249.06
Rural pensioners	1.0	1.0	4.0	82	194.49
Farmers	1.0	2.0	4.0	151	275.33
Rural newcomers	1.0	1.0	4.0	103	227.76
Sample	1.0	1.0	5.0	486	***
4. Age of farm operator (years)					
Rural diversifiers	34.6	54.0	66.0	150	274.56
Rural pensioners	47.8	65.0	75.8	83	400.22
Farmers	32.6	50.0	63.0	151	228.48
Rural newcomers	23.0	35.0	57.4	103	96.35
Sample	28.0	52.0	69.0	487	***
5. Farm operator's experiences as farm manager (years)					
Rural diversifiers	4.0	16.0	32.8	150	239.50
Rural pensioners	5.0	17.0	40.0	83	295.99
Farmers	6.0	18.0	33.0	151	299.62
Rural newcomers	2.0	9.0	20.0	103	127.13
Sample	3.4	16.0	34.6	487	***
6. Share of net non-farm income (self-employment plus dependent employment) in household net income (per cent)					
Rural diversifiers	29.7	65.79	96.29	128	330.52
Rural pensioners	0.0	0.00	61.68	76	122.29
Farmers	0.0	0.00	72.11	136	168.49
Rural newcomers	0.0	26.07	76.96	86	191.13
Sample	0.0	30.56	89.70	426	***

Notes: ¹⁾ Lowest 5%. ²⁾ Highest 5%. ³⁾ Significance levels of Kruskal-Wallis test: * 10%, ** 5%, and *** 1%.

⁴⁾ 0: no studies and cannot read or write, 1: no studies but can read and write, 2: elementary school, 3: vocational school, 4: secondary school, grammar school, 5: other occupation-specific higher education, 6: B.Sc., 7: M.Sc., 8: post graduate studies, 9: Ph.D. ⁵⁾ 1: none/only practical experience, 2: only short courses, 3: agricultural vocational school, 4: agricultural secondary school, 5: agricultural graduate studies, 6: post graduate studies.

Source: Own calculation with data from project survey.

Table A 8: Household characteristics by SFH type

	P ₅ ¹⁾	Median or Per cent	P ₉₅ ²⁾	N	Mean rank/Sig. ³⁾
7. Share of own-consumed agricultural production in total agricultural production (per cent)					
Rural diversifiers	33.03	68.65	94.89	134	323.69
Rural pensioners	31.03	64.56	95.28	79	291.15
Farmers	0.74	38.84	76.71	149	162.08
Rural newcomers	4.12	40.89	81.99	101	167.23
Sample	6.00	53.05	90.68	463	***
8. Household's cash balance (EUR)					
Rural diversifiers	-4,822.10	-725.28	3,353.50	150	249.68
Rural pensioners	-5,239.47	-1,047.78	1,069.66	83	224.30
Farmers	-5,344.44	70.04	5,725.67	153	286.22
Rural newcomers	-8,428.44	-1,906.74	3,239.40	103	193.64
Sample	-6,139.27	-883.23	4,098.24	489	***
9. Gender of household head (households headed by females)					
Rural diversifiers		14.8 ⁴⁾		22	
Rural pensioners		12.0 ⁴⁾		10	
Farmers		22.2 ⁴⁾		34	
Rural newcomers		12.6 ⁴⁾		13	
Sample		16.2 ⁴⁾		79	* ⁵⁾
10. Household net income (EUR)					
Rural diversifiers	853.76	3,486.20	8,969.19	150	253.79
Rural pensioners	-101.67	1,968.82	4,543.64	83	141.88
Farmers	-203.20	5,412.65	12,324.24	153	307.93
Rural newcomers	-802.00	2,895.14	10,067.63	103	221.83
Sample	281.34	3,437.54	10,170.09	489	***
11. Share of net farm income in net household income (per cent)					
Rural diversifiers	0.30	16.73	52.47	93	115.45
Rural pensioners	1.29	26.74	60.69	39	144.67
Farmers	3.72	36.54	97.64	111	181.92
Rural newcomers	1.42	35.72	100.00	69	177.62
Sample	1.37	26.63	95.53	312	***
12. Net farm income (EUR)					
Rural diversifiers	-1,123.19	204.78	2,013.82	150	220.41
Rural pensioners	-1,313.23	-39.05	1,482.67	83	186.67
Farmers	-1,675.86	1,124.96	5,224.19	153	299.18
Rural newcomers	-2,048.96	532.00	3,497.91	103	247.34
Sample	-1,622.71	356.00	4,100.30	489	***
13. Non-farm (self-employment plus dependent employment) net income (EUR)					
Rural diversifiers	716.08	2,349.60	7,554.75	150	346.20
Rural pensioners	0.00	0.00	1,825.27	83	130.56
Farmers	0.00	0.00	5,930.41	153	221.75
Rural newcomers	0.00	1,068.85	4,832.76	103	224.39
Sample	0.00	1,233.29	5,555.90	489	***

Notes: ¹⁾ Lowest 5%. ²⁾ Highest 5%. ³⁾ Significance levels of Kruskal-Wallis test: * 10%, ** 5%, and *** 1%.

⁴⁾ Percentage of female household heads. ⁵⁾ Significance levels for Chi² test: * 10%, ** 5%, and *** 1%.

Source: Own calculation with data from project survey.

Table A 9: Household characteristics by SFH type

	P ₅ ¹⁾	Median	P ₉₅ ²⁾	N	Mean rank/Sig. ³⁾
14. Income from assets and remittances (EUR)					
Rural diversifiers	0.00	0.00	809.35	144	263.85
Rural pensioners	0.00	0.00	597.06	82	273.42
Farmers	0.00	0.00	180.85	152	212.47
Rural newcomers	0.00	0.00	365.17	101	220.29
Sample	0.00	0.00	431.65	479	***
15. Costs of non-farm income activities (EUR)					
Rural diversifiers	0.00	215.83	1,526.85	144	290.17
Rural pensioners	0.00	0.00	313.28	82	167.35
Farmers	0.00	0.00	1,464.66	152	234.50
Rural newcomers	0.00	0.00	1,564.26	101	235.73
Sample	0.00	0.00	1,421.40	479	***
16. Household living expenditures as used for calculating the viability measures (EUR)					
Rural diversifiers	1,909.75	4,322.67	8,659.22	150	237.07
Rural pensioners	1,383.75	2,959.89	6,914.96	83	139.60
Farmers	2,510.12	5,243.73	10,305.15	153	281.69
Rural newcomers	1,818.84	5,555.96	10,214.28	103	286.98
Sample	1,862.43	4,408.70	9,278.78	489	***
17. Household expenditures as used for calculating household's cash balance (EUR)					
Rural diversifiers	1,991.98	4,430.07	9,036.92	150	240.10
Rural pensioners	1,387.86	3,023.61	6,984.87	83	138.71
Farmers	2,510.12	5,351.88	10,567.80	153	279.00
Rural newcomers	1,818.84	5,640.24	10,874.02	103	287.28
Sample	1,896.18	4,722.55	9,738.74	489	***
18. Amount of loan repayments(EUR)					
Rural diversifiers	0.00	0.00	7,337.87	150	278.46
Rural pensioners	0.00	0.00	1,116.91	83	226.10
Farmers	0.00	0.00	2,271.89	153	226.01
Rural newcomers	0.00	0.00	5,632.20	103	239.72
Sample	0.00	0.00	4,272.00	489	***
19. Number of rooms in the household's residential house (number)					
Rural diversifiers	3.0	5.0	8.0	150	297.77
Rural pensioners	3.0	4.0	7.9	82	229.68
Farmers	2.0	4.0	6.7	146	203.21
Rural newcomers	2.0	4.0	7.0	100	213.13
Sample	2.0	4.0	7.0	478	***
20. Number of household members (number)					
Rural diversifiers	2.0	3.0	6.0	150	259.13
Rural pensioners	1.2	2.0	5.0	83	175.36
Farmers	1.0	3.0	6.0	153	245.11
Rural newcomers	2.0	4.0	6.8	103	280.36
Sample	2.0	3.0	6.0	489	***
21. Number of dependent household members (number)					
Rural diversifiers	0.0	0.0	2.0	150	219.66
Rural pensioners	0.0	1.0	2.8	83	293.43
Farmers	0.0	0.0	3.0	153	230.68
Rural newcomers	0.0	1.0	3.8	103	264.15
Sample	0.0	1.0	3.0	489	***

Notes: ¹⁾ Lowest 5%. ²⁾ Highest 5%. ³⁾ Significance levels of Kruskal-Wallis test: * 10%, ** 5%, and *** 1%.

Source: Own calculation with data from project survey.

Table A 10: Farm characteristics by SFH type

	P ₅ ¹⁾	Median	P ₉₅ ²⁾	N	Mean rank/Sig. ³⁾
22. Economic farm size (EUR)					
Rural diversifiers	516.05	2,824.54	6,642.22	150	220.93
Rural pensioners	191.35	1,656.40	5,293.30	83	137.31
Farmers	860.68	4,667.86	10,365.97	153	319.93
Rural newcomers	-94.90	3,206.85	9,275.84	103	255.51
Sample	363.84	3,132.63	8,783.93	489	***
23. Cultivated agricultural area per household (ha)					
Rural diversifiers	0.05	3.07	10.16	150	217.23
Rural pensioners	0.04	1.08	8.18	83	159.20
Farmers	2.01	7.04	13.12	153	357.22
Rural newcomers	0.00	2.66	8.40	103	187.89
Sample	0.03	3.60	11.58	489	***
24. Share of crop production in total agricultural production (per cent)					
Rural diversifiers	8.93	39.77	79.26	150	228.94
Rural pensioners	2.46	32.74	72.82	83	192.18
Farmers	25.44	54.97	100.00	152	323.73
Rural newcomers	0.00	30.48	89.12	103	192.40
Sample	0.24	43.44	99.76	488	***
25. Number of agricultural products (number)					
Rural diversifiers	9.0	17.0	24.0	150	344.87
Rural pensioners	6.2	14.0	22.8	83	281.87
Farmers	2.0	10.0	18.0	153	168.97
Rural newcomers	2.2	10.0	18.8	103	182.79
Sample	3.0	13.0	22.0	489	***
27. Costs of purchased inputs for animal production per unit animal production (ratio)					
Rural diversifiers	0.00	0.11	0.80	142	210.08
Rural pensioners	0.00	0.18	1.35	80	248.52
Farmers	0.00	0.14	0.72	129	210.69
Rural newcomers	0.01	0,17	1.41	95	239.88
Sample	0.00	0.15	0.95	446	*
28. Variable costs of agricultural production (EUR)					
Rural diversifiers	135.31	590.24	2,324.19	150	180.46
Rural pensioners	57.55	450.15	1,758.52	83	157.91
Farmers	357.42	1,680.32	3,876.66	153	344.99
Rural newcomers	82.86	1,111.11	3,343.55	103	260.64
Sample	135.16	882.88	3,204.26	489	***
29. Other costs related to farming (EUR)					
Rural diversifiers	2.83	227.84	1,560.11	150	182.73
Rural pensioners	1.75	184.99	1,300.18	83	157.25
Farmers	192.24	1,024.85	2,645.50	153	340.04
Rural newcomers	6.10	569.60	3,395.70	103	265.22
Sample	9.51	477.90	2,308.93	489	***

Notes: ¹⁾ Lowest 5%. ²⁾ Highest 5%. ³⁾ Significance levels of Kruskal-Wallis test: * 10%, ** 5%, and *** 1%.

Source: Own calculation with data from project survey.

Table A 11: Farm characteristics by SFH type

	P ₅ ¹⁾	Median	P ₉₅ ²⁾	N	Mean rank/Sig. ³⁾
30. Quality of land (scale) ⁴⁾					
Rural diversifiers	2.0	4.0	5.0	142	277.19
Rural pensioners	2.0	4.0	5.0	80	277.61
Farmers	1.0	3.0	4.0	151	171.52
Rural newcomers	2.0	3.0	5.0	86	210.47
Sample	2.0	3.0	5.0	459	***
31. Corn yield (dt/ha)					
Rural diversifiers	11.21	40.00	80.00	102	106.04
Rural pensioners	8.63	35.50	74.25	48	94.06
Farmers	20.00	50.00	80.00	44	129.81
Rural newcomers	0.94	41.36	87.86	21	103.67
Sample	11.63	40.00	80.00	215	**
32. Wheat yield (dt/ha)					
Rural diversifiers	2.50	25.00	44.50	107	105.08
Rural pensioners	2.67	26.50	41.90	40	111.43
Farmers	12.41	30.00	54.67	63	152.31
Rural newcomers	2.14	30.00	48.44	30	120.78
Sample	3.00	30.00	47.14	240	***
33. Milk performance (l/dairy cow)					
Rural diversifiers	1,428.57	3,000.00	5,880.00	75	119.88
Rural pensioners	750.00	2,250.00	5,350.00	49	93.28
Farmers	1,352.00	3,200.00	4,890.00	71	140.65
Rural newcomers	1,000.00	3,100.00	6,583.33	49	129.43
Sample	1,212.50	3,000.00	5,475.00	244	***

Notes: ¹⁾ Lowest 5%. ²⁾ Highest 5%. ³⁾ Significance levels of Kruskal-Wallis test: * 10%, ** 5%, and *** 1%. ⁴⁾ 1: very poor, 2: poor, 3: neither good nor poor, 4: good, 5: very good.

Source: Own calculation with data from project survey.

Table A 12: Behavioural characteristics by SFH type

	P ₅ ¹⁾	Median	P ₉₅ ²⁾	N	Mean rank/Sig. ³⁾
34. Importance of maximising agricultural net production (points) ⁴⁾					
Rural diversifiers	0.0	20.0	50.0	150	221.57
Rural pensioners	0.0	20.0	52.4	83	235.18
Farmers	0.0	20.0	73.0	153	275.38
Rural newcomers	0.0	20.0	64.8	103	241.90
Sample	0.0	20.0	63.5	489	***
35. Importance of maximising non-farm income (points) ⁴⁾					
Rural diversifiers	0.0	10.0	60.0	150	217.24
Rural pensioners	0.0	10.0	57.8	83	205.62
Farmers	0.0	20.0	73.0	153	275.61
Rural newcomers	0.0	20.0	64.0	103	271.69
Sample	0.0	15.0	65.0	489	***
36. Importance of maximising household's income (points) ⁴⁾					
Rural diversifiers	0.0	21.0	64.5	150	262.88
Rural pensioners	0.0	20.0	50.0	83	257.02
Farmers	0.0	20.0	50.0	153	223.47
Rural newcomers	0.0	20.0	78.0	103	241.25
Sample	0.0	20.0	50.0	489	*
37. Importance of maximising annual cash balance (points) ⁴⁾					
Rural diversifiers	0.0	5.0	43.9	150	225.58
Rural pensioners	0.0	14.0	40.0	83	282.70
Farmers	0.0	10.0	33.0	153	232.48
Rural newcomers	0.0	10.0	45.6	103	261.50
Sample	0.0	10.0	40.0	489	***
38. Importance of minimising agricultural labour input (points) ⁴⁾					
Rural diversifiers	0.0	20.0	89.0	150	272.66
Rural pensioners	0.0	20.0	68.0	83	282.13
Farmers	0.0	10.0	40.0	153	218.49
Rural newcomers	0.0	10.0	50.0	103	214.18
Sample	0.0	15.0	60.0	489	***
39. Aim: Diversify income sources (scale) ⁵⁾					
Rural diversifiers	1.0	5.0	5.0	150	278.97
Rural pensioners	1.0	4.0	5.0	83	194.54
Farmers	1.0	4.0	5.0	153	241.48
Rural newcomers	1.0	4.0	5.0	103	241.42
Sample	1.0	4.0	5.0	489	***
43. Aim: Conserve the heritage (scale) ⁵⁾					
Rural diversifiers	2.0	5.0	5.0	150	259.35
Rural pensioners	1.0	5.0	5.0	83	266.79
Farmers	2.0	4.0	5.0	153	232.48
Rural newcomers	1.0	4.0	5.0	103	225.13
Sample	1.0	4.0	5.0	489	*

Notes: ¹⁾ Lowest 5%. ²⁾ Highest 5%. ³⁾ Significance levels of Kruskal-Wallis test: * 10%, ** 5%, and *** 1%.

⁴⁾ Up to 100 points could be distributed among the five objectives. ⁵⁾ 1: not important at all, 2: not important, 3: neither important nor unimportant, 4: important, 5: very important.

Source: Own calculation with data from project survey.

Table A 13: Behavioural characteristics by SFH type

	P ₅ ¹⁾	Median/ Per cent	P ₉₅ ²⁾	N	Mean rank/Sig. ³⁾
45. Aim: Provide for the next generation (scale) ⁴⁾					
Rural diversifiers	1.0	4.0	5.0	150	224.34
Rural pensioners	1.0	4.0	5.0	83	225.68
Farmers	1.0	5.0	5.0	153	275.12
Rural newcomers	1.0	5.0	5.0	103	245.90
Sample	1.0	5.0	5.0	489	***
46. Aim: Provide children with a good/higher education (scale) ⁴⁾					
Rural diversifiers	1.0	5.0	5.0	150	243.12
Rural pensioners	1.0	4.0	5.0	83	192.69
Farmers	1.0	5.0	5.0	153	264.42
Rural newcomers	1.0	5.0	5.0	103	261.03
Sample	1.0	5.0	5.0	489	***
48. Aim: Have time for leisure activities (scale) ⁴⁾					
Rural diversifiers	2.0	5.0	5.0	150	248.33
Rural pensioners	1.0	4.0	5.0	83	221.48
Farmers	3.0	5.0	5.0	153	262.31
Rural newcomers	1.0	4.0	5.0	103	233.40
Sample	2.0	5.0	5.0	489	*
49. Relations to fellow small-scale farmers (scale) ⁵⁾					
Rural diversifiers	3.0	4.0	5.0	150	259.58
Rural pensioners	3.0	4.0	5.0	83	238.13
Farmers	3.0	4.0	5.0	153	250.59
Rural newcomers	3.0	4.0	5.0	102	218.38
Sample	3.0	4.0	5.0	488	*
50. Participation in co-operation (percentage of households answering "yes")					
With fellow small-scale farmers					
Rural diversifiers		52.0		78	
Rural pensioners		38.6		32	
Farmers		68.6		105	
Rural newcomers		47.6		49	
Sample		54.0		264	*** ⁶⁾
With large-scale private farmers					
Rural diversifiers		14.7		22	
Rural pensioners		6.0		5	
Farmers		37.9		58	
Rural newcomers		18.4		19	
Sample		21.3		104	*** ⁶⁾
With corporate farms					
Rural diversifiers		14.0		21	
Rural pensioners		8.4		7	
Farmers		26.8		41	
Rural newcomers		15.5		16	
Sample		17.4		85	*** ⁶⁾

Notes: ¹⁾ Lowest 5%. ²⁾ Highest 5%. ³⁾ Significance levels of Kruskal-Wallis test: * 10%, ** 5%, and *** 1%.

⁴⁾ 1: not important at all, 2: not important, 3: neither important nor unimportant, 4: important, 5: very important. ⁵⁾ 1: hostile, 2: bad relations, 3: no relations, 4: good relations, 5: mutual help. ⁶⁾ Significance levels for Chi² test: * 10%, ** 5%, and *** 1%.

Source: Own calculation with data from project survey.

Table A 14: Behavioural characteristics by SFH type

	P ₅ ¹⁾	Median/ Per cent	P ₉₅ ²⁾	N	Mean rank/Sig. ³⁾
51. Frequency of co-operations with fellow small-scale farmers (number)					
With fellow small-scale farmers					
Rural diversifiers	1.0	6.0	15.3	78	136.37
Rural pensioners	1.0	4.0	15.0	32	95.41
Farmers	2.0	5.5	20.0	104	142.33
Rural newcomers	1.0	5.0	16.4	48	124.19
Sample	1.0	5.0	20.0	262	**
With large-scale private farmers					
Rural diversifiers	1.0	6.0	19.3	22	59.77
Rural pensioners	1.0	2.0		5	21.00
Farmers	2.0	5.0	15.0	58	51.04
Rural newcomers	2.0	5.0		19	56.82
Sample	1.0	5.0	15.0	104	*
With corporate farms					
Rural diversifiers	1.0	6.0	19.8	20	47.23
Rural pensioners	1.0	1.0		6	19.00
Farmers	1.1	5.0	15.0	41	43.35
Rural newcomers	2.0	5.0		16	40.63
Sample	1.0	5.0	15.0	83	*
52. Membership in formal organisations (percentage households answering "yes")					
Input supply coop					
Rural diversifiers		0.7		1	
Rural pensioners		2.4		2	
Farmers		3.9		6	
Rural newcomers		0.0		0	
Sample		1.8		9	* 4)
Producer coop					
Rural diversifiers		14.0		21	
Rural pensioners		9.6		8	
Farmers		0.7		1	
Rural newcomers		4.9		5	
Sample		7.2		35	*** 4)
Milk coop					
Rural diversifiers		2.0		3	
Rural pensioners		4.8		4	
Farmers		11.1		17	
Rural newcomers		7.8		8	
Sample		6.5		32	** 4)
Savings and credit coop					
Rural diversifiers		0.0		0	
Rural pensioners		0.0		0	
Farmers		9.2		14	
Rural newcomers		1.9		2	
Sample		3.3		16	*** 4)

Notes: ¹⁾ Lowest 5%. ²⁾ Highest 5%. ³⁾ Significance levels of Kruskal-Wallis test: * 10%, ** 5%, and *** 1%. ⁴⁾ Significance levels for Chi² test: * 10%, ** 5%, and *** 1%.

Source: Own calculation with data from project survey.

Table A 15: Behavioural characteristics by SFH type

	Per cent	N	Sig. ¹⁾
53. Membership in formal organisations (percentage households answering "yes")			
Women association			
Rural diversifiers	0.7	1	
Rural pensioners	1.2	1	
Farmers	9.8	15	
Rural newcomers	1.0	1	
Sample	3.7	18	***
Agricultural association			
Rural diversifiers	2.0	3	
Rural pensioners	1.2	1	
Farmers	12.4	19	
Rural newcomers	6.8	7	
Sample	6.1	30	***
Political party			
Rural diversifiers	19.3	29	
Rural pensioners	15.7	13	
Farmers	7.8	12	
Rural newcomers	10.7	11	
Sample	13.3	65	**
54. Willingness to become a member formal organisations (percentage households answering "yes")			
Marketing coop			
Rural diversifiers	6.7	10	
Rural pensioners	13.4	11	
Farmers	15.9	24	
Rural newcomers	16.5	17	
Sample	12.8	62	*
Producer coop			
Rural diversifiers	10.9	14	
Rural pensioners	16.0	12	
Farmers	1.3	2	
Rural newcomers	6.1	6	
Sample	7.5	34	***
Milk coop			
Rural diversifiers	10.9	16	
Rural pensioners	7.6	6	
Farmers	2.9	4	
Rural newcomers	5.3	5	
Sample	6.8	31	*
Women association			
Rural diversifiers	3.4	5	
Rural pensioners	9.8	8	
Farmers	11.6	16	
Rural newcomers	8.8	9	
Sample	8.1	38	*

Notes: ¹⁾ Significance levels for Chi² test: * 10%, ** 5%, and *** 1%.

Source: Own calculation with data from project survey.

Table A 16: Behavioural characteristics by SFH type: Future intentions of the household concerning the farm

	Per cent	N	Sig. ¹⁾
55. Future intentions of household concerning the farm (percentage households) ²⁾			
Stop farming			
Rural diversifiers	2.0	3	
Rural pensioners	8.4	7	
Farmers	10.5	16	
Rural newcomers	3.9	4	
Sample	6.1	30	
Keep the farm for subsistence production			
Rural diversifiers	18.8	28	
Rural pensioners	26.5	22	
Farmers	9.8	15	
Rural newcomers	9.8	10	
Sample	15.3	75	
Reduce farming activities			
Rural diversifiers	2.0	3	
Rural pensioners	4.8	4	
Farmers	7.2	11	
Rural newcomers	2.0	2	
Sample	4.1	20	
Continue as it is			
Rural diversifiers	36.9	55	
Rural pensioners	32.5	27	
Farmers	28.1	43	
Rural newcomers	28.4	29	
Sample	31.5	154	
Modernise without extension			
Rural diversifiers	23.5	35	
Rural pensioners	8.4	7	
Farmers	17.6	27	
Rural newcomers	22.5	23	
Sample	18.8	92	
Extend farming without modernisation			
Rural diversifiers	12.1	18	
Rural pensioners	8.4	7	
Farmers	17.0	26	
Rural newcomers	13.7	14	
Sample	13.3	65	
Extend farming with modernisation			
Rural diversifiers	4.0	6	
Rural pensioners	9.6	8	
Farmers	9.2	14	
Rural newcomers	19.6	20	
Sample	9.8	48	
Sample	100.0	489	***

Notes: ¹⁾ Significance levels for Chi² test: * 10%, ** 5%, and *** 1%. ²⁾ The category "other" is not mentioned in this table due to the low number of answers in this category. Only three households selected the category "other", i.e. one household for the SFH types "rural diversifiers", "rural pensioners", and "farmers".

Source: Own calculation with data from project survey.

Table A 17: Behavioural characteristics by SFH type

	Per cent	N	Sig. ¹⁾
56. Not having a successor is an important reason for the decision to stop or reduce farming activities (percentage households answering "true")			
Rural diversifiers	20.6	7	
Rural pensioners	54.5	18	
Farmers	50.0	21	
Rural newcomers	18.8	3	
Sample	39.2	49	***
57. Knowing the transitional semi-subsistence measure (percentage households answering "yes")			
Rural diversifiers	18.8	26	
Rural pensioners	30.4	24	
Farmers	74.6	103	
Rural newcomers	48.3	42	
Sample	44.1	195	***
58. Application for the transitional semi-subsistence measure in 2006 (percentage households answering "yes")			
Rural diversifiers	57.1	4	
Rural pensioners	33.3	3	
Farmers	77.8	77	
Rural newcomers	50.0	17	
Sample	67.8	101	***
60. Intended future application for the transitional semi-subsistence measure (percentage households answering "yes")			
Rural diversifiers	22.3	29	
Rural pensioners	41.4	29	
Farmers	15.4	6	
Rural newcomers	49.1	26	
Sample	30.8	90	***

Notes: ¹⁾ Significance levels for Chi² test: * 10%, ** 5%, and *** 1%.

Source: Own calculation with data from project survey.

Table A 18: Characteristics of the external environment by SFH type

	P ₅ ¹⁾	Median	P ₉₅ ²⁾	N	Mean rank/Sig. ³⁾
61. Distances to infrastructural facilities (km)					
Retail shop					
Rural diversifiers	0.0	0.5	1.0	144	251.03
Rural pensioners	0.0	0.5	1.0	82	253.46
Farmers	0.0	0.5	1.5	152	212.12
Rural newcomers	0.0	0.5	3.9	101	255.31
Sample	0.0	0.5	2.0	479	**
Post office					
Rural diversifiers	0.1	0.5	3.8	144	200.40
Rural pensioners	0.0	0.5	7.0	82	194.15
Farmers	0.0	2.0	12.0	152	290.12
Rural newcomers	0.0	1.0	8.0	101	258.27
Sample	0.0	1.0	8.0	479	***
Primary school					
Rural diversifiers	0.1	0.5	3.8	144	212.16
Rural pensioners	0.0	0.5	3.0	82	211.23
Farmers	0.0	1.0	4.0	152	255.89
Rural newcomers	0.0	1.0	6.0	101	279.14
Sample	0.0	0.7	5.0	479	***
Secondary school					
Rural diversifiers	0.5	10.0	40.0	144	217.16
Rural pensioners	0.0	14.0	33.9	82	243.71
Farmers	0.0	12.0	37.0	152	242.08
Rural newcomers	0.0	13.0	40.0	101	266.42
Sample	0.0	12.0	40.0	479	*
Agricultural administration					
Rural diversifiers	0.4	20.0	80.0	144	277.47
Rural pensioners	0.1	14.0	40.0	82	225.18
Farmers	0.0	12.0	40.0	152	220.80
Rural newcomers	0.3	13.0	45.0	101	227.51
Sample	0.2	14.0	65.0	479	***
Public bus stop					
Rural diversifiers	0.0	0.5	2.0	144	252.93
Rural pensioners	0.0	0.5	1.0	82	220.39
Farmers	0.0	0.5	3.0	152	219.57
Rural newcomers	0.0	0.5	9.8	101	268.23
Sample	0.0	0.5	3.0	479	**
Agricultural extension service					
Rural diversifiers	0.2	7.0	55.3	144	239.49
Rural pensioners	0.1	14.0	50.0	82	284.21
Farmers	0.0	5.0	30.0	152	202.49
Rural newcomers	0.2	10.0	49.3	101	261.27
Sample	0.2	7.0	45.0	479	***

Notes: ¹⁾ Lowest 5%. ²⁾ Highest 5%. ³⁾ Significance levels of Kruskal-Wallis test: * 10%, ** 5%, and *** 1%.

Source: Own calculation with data from project survey.

Table A 19: Characteristics of the external environment by SFH type

	P ₅ ¹⁾	Median	P ₉₅ ²⁾	N	Mean rank/Sig. ³⁾
61. Distances to infrastructural facilities (km)					
General practitioner					
Rural diversifiers	0.2	1.0	14.5	144	208.60
Rural pensioners	0.0	0.5	10.0	82	204.61
Farmers	0.0	3.0	12.0	152	269.41
Rural newcomers	0.0	3.0	14.9	101	269.24
Sample	0.0	1.0	13.0	479	***
Hospital					
Rural diversifiers	0.5	13.0	40.0	144	215.39
Rural pensioners	0.0	15.0	33.9	82	230.37
Farmers	0.0	13.5	39.4	152	249.95
Rural newcomers	0.4	15.0	44.5	101	267.93
Sample	0.5	14.0	40.0	479	**
63. Frequency to go to the next big urban centre by public transport system per day (number)					
Rural diversifiers	1.0	5.0	12.0	143	230.58
Rural pensioners	1.0	4.0	12.0	79	201.29
Farmers	1.1	6.0	12.0	141	248.04
Rural newcomers	0.0	5.0	12.0	92	216.21
Sample	1.0	5.0	12.0	455	*
64. Time needed to go to the next big urban centre by public transport system (minutes)					
Rural diversifiers	11.3	40.0	120.0	144	268.79
Rural pensioners	15.0	40.0	77.0	82	257.96
Farmers	0.0	30.0	60.0	152	210.53
Rural newcomers	0.0	30.0	87.0	101	228.72
Sample	0.0	30.0	90.0	479	***
65. Time needed to go to the next big urban centre by car (minutes)					
Rural diversifiers	10.0	30.0	60.0	144	280.30
Rural pensioners	10.0	20.0	45.0	82	241.12
Farmers	0.0	20.0	41.8	152	199.20
Rural newcomers	0.5	25.0	60.0	101	243.03
Sample	5.0	20.0	60.0	479	***

Notes: ¹⁾ Lowest 5%. ²⁾ Highest 5%. ³⁾ Significance levels of Kruskal-Wallis test: * 10%, ** 5%, and *** 1%.

Source: Own calculation with data from project survey.

Table A 20: Characteristics of the external environment by SFH type

	P ₅ ¹⁾	Median	P ₉₅ ²⁾	N	Mean rank/Sig. ³⁾
66. Share of social security benefits in net household income (per cent)					
Rural diversifiers	0.00	10.51	51.34	147	184.03
Rural pensioners	29.31	64.56	95.23	59	384.93
Farmers	0.00	8.31	59.08	143	185.66
Rural newcomers	0.00	18.90	77.02	88	220.34
Sample	0.00	17.56	76.66	437	***
67. Amount of received social security benefits (EUR)					
Rural diversifiers	0.00	483.04	2,088.88	144	196.88
Rural pensioners	456.75	1,438.84	3,064.72	82	348.86
Farmers	0.00	403.25	3,976.83	152	225.26
Rural newcomers	0.00	589.16	3,911.94	101	235.29
Sample	0.00	717.70	3,275.20	479	***
68. Share of agricultural and other subsidies in net household income (per cent)					
Rural diversifiers	0.00	0.00	21.52	143	174.77
Rural pensioners	0.00	0.00	48.58	78	159.42
Farmers	0.00	24.22	66.31	137	311.50
Rural newcomers	0.00	2.69	65.46	89	225.01
Sample	0.00	2.23	58.03	447	***
69. Amount of received agricultural and other subsidies (EUR)					
Rural diversifiers	0.00	0.00	986.12	144	187.38
Rural pensioners	0.00	0.00	1,290.09	82	165.21
Farmers	0.00	1,706.84	4,239.74	152	333.46
Rural newcomers	0.00	99.68	3,060.46	101	235.08
Sample	0.00	85.44	3,339.78	479	***

Notes: ¹⁾ Lowest 5%. ²⁾ Highest 5%. ³⁾ Significance levels of Kruskal-Wallis test: * 10%, ** 5%, and *** 1%.

Source: Own calculation with data from project survey.

Table A 21: Viability of major types of SFH

	P ₅ ¹⁾	Median	P ₉₅ ²⁾	N	Mean rank/Sig. ³⁾
70. Viability considering net earned income (ratio)					
Rural diversifiers	0.10	0.63	1.60	150	314.74
Rural pensioners	-0.41	0.08	0.71	83	126.02
Farmers	-0.23	0.48	1.58	153	256.46
Rural newcomers	-0.28	0.39	1.31	103	222.30
Sample	-0.19	0.45	1.45	489	***
71. Viability considering net earned income plus received subsidies (ratio)					
Rural diversifiers	0.11	0.69	1.66	150	283.03
Rural pensioners	-0.35	0.16	0.79	83	110.39
Farmers	-0.15	0.81	2.04	153	298.25
Rural newcomers	-0.15	0.50	1.50	103	218.99
Sample	-0.14	0.57	1.68	489	***
72. Viability considering net earned income plus received social security benefits (ratio)					
Rural diversifiers	0.22	0.81	1.65	150	284.00
Rural pensioners	-0.06	0.59	1.52	83	218.95
Farmers	-0.14	0.67	1.72	153	245.72
Rural newcomers	-0.23	0.53	1.61	103	208.13
Sample	-0.07	0.68	1.65	489	***
73. Viability considering household net income (ratio)					
Rural diversifiers	0.25	0.89	1.84	150	257.21
Rural pensioners	-0.04	0.65	1.58	83	196.60
Farmers	0.18	1.09	2.37	153	288.37
Rural newcomers	-0.14	0.65	1.73	103	201.81
Sample	0.08	0.83	1.89	489	***

Notes: ¹⁾ Lowest 5%. ²⁾ Highest 5%. ³⁾ Significance levels of Kruskal-Wallis test: * 10%, ** 5%, and *** 1%.

Source: Own calculation with data from project survey.

Table A 22: Variables excluded from interpretation

Excluded Variable	Reason for exclusion
26. Costs of purchased inputs for crop production per unit crop production (ratio)	Not significant*
40. Aim: Be rooted to the soil (scale)	Not significant
41. Aim: Enjoy rural lifestyle (scale)	Not significant
42. Aim: Be respected in the village (scale)	Not significant
44. Aim: Keep up the family's traditions (scale)	Not significant
47. Aim: Avoid taking advances (scale)	Not significant
49. Relations to large-scale private farmers and to corporate farms (scale)	Not significant
52. Formality of co-operations with fellow small-scale farmers, large-scale private farmers, and corporate farms (scale)	Not significant
53. Membership in the formal organisations: marketing coop, youth association, producer association	Not significant
54. Willingness to become a member in the formal organisations: input supply coop, savings and credit coop, youth association, agricultural association, producer association, and political party	Not significant
61. Distances to bank (km)	Not significant
62. Mobile retail shops coming to the village (scale)	Not significant

Note: * Not significant=no significant difference between cluster medians.

Source: Own calculation with data from project survey.

Table A 23: Inter-country differences within SFH types for the variable "importance of maximising agricultural net production (points)"

	P ₅ ¹⁾	Median	P ₉₅ ²⁾	N	Mean rank/Sig. ³⁾
Rural diversifiers⁴⁾	0.0	20.0	50.0	150	
Poland	0.0	7.5	--	8	56.3
Romania	0.0	20.0	50.0	63	80.1
Bulgaria	0.0	18.0	50.0	79	73.8
Rural pensioners	0.0	20.0	52.4	83	
Poland	0.0	22.5	--	10	47.7
Romania	0.0	20.0	--	12	36.4
Bulgaria	0.0	20.0	58.4	61	42.2
Farmers	0.0	20.0	73.0	153	**
Poland	0.0	30.0	80.0	103	78.0
Romania	10.0	20.0	58.5	42	65.0
Bulgaria	20.0	30.0	--	8	102.0
Rural newcomers	0.0	20.0	64.8	103	
Poland	0.0	20.0	63.0	37	47.2
Romania	4.3	20.0	40.0	36	49.0
Bulgaria	2.2	23.0	82.0	30	61.6
Sample	0.0	20.0	63.5	489	

Notes: ¹⁾ Lowest 5%. ²⁾ Highest 5%. ³⁾ Significance levels of Kruskal-Wallis test: * 10%, ** 5%, and *** 1%. ⁴⁾ -- Not calculated for lack of sufficient observations.

Source: Own calculation with data from project survey.

Table A 24: Inter-country differences within SFH types for the variable "importance of maximising non-farm income (points)"

	P ₅ ¹⁾	Median	P ₉₅ ²⁾	N	Mean rank/Sig. ³⁾
Rural diversifiers ⁴⁾	0.0	10.0	60.0	150	***
Poland	0.0	45.0	--	8	113.4
Romania	0.0	0.0	42.0	63	51.8
Bulgaria	0.0	16.0	57.0	79	90.6
Rural pensioners	0.0	10.0	57.8	83	
Poland	0.0	15.0	--	10	46.8
Romania	0.0	0.0	--	12	32.2
Bulgaria	0.0	10.0	57.9	61	43.1
Farmers	0.0	20.0	73.0	153	***
Poland	0.0	25.0	80.0	103	84.5
Romania	0.0	20.0	34.3	42	65.2
Bulgaria	0.0	7.5	--	8	43.2
Rural newcomers	0.0	20.0	64.0	103	***
Poland	0.0	40.0	81.0	37	67.5
Romania	0.0	20.0	31.5	36	42.7
Bulgaria	1.1	10.5	54.8	30	44.0
Sample	0.0	15.0	65.0	489	

Notes: ¹⁾ Lowest 5%. ²⁾ Highest 5%. ³⁾ Significance levels of Kruskal-Wallis test: * 10%, ** 5%, and *** 1%. ⁴⁾ -- Not calculated for lack of sufficient observations.

Source: Own calculation with data from project survey.

Table A 25: Inter-country differences within SFH types for the variable "importance of maximising household's income (points)"

	P ₅ ¹⁾	Median	P ₉₅ ²⁾	N	Mean rank/Sig. ³⁾
Rural diversifiers ⁴⁾	0.0	21.0	64.5	150	
Poland	0.0	17.5	--	8	51.6
Romania	0.0	20.0	100.0	63	72.9
Bulgaria	4.0	23.0	51.0	79	80.0
Rural pensioners	0.0	20.0	50.0	83	
Poland	0.0	17.5	--	10	33.1
Romania	0.0	20.0	--	12	42.8
Bulgaria	0.1	20.0	50.0	61	43.3
Farmers	0.0	20.0	50.0	153	***
Poland	0.0	10.0	50.0	103	66.3
Romania	0.0	27.5	50.0	42	98.9
Bulgaria	18.0	24.0	--	8	99.3
Rural newcomers	0.0	20.0	78.0	103	*
Poland	0.0	10.0	82.0	37	45.0
Romania	8.5	22.5	41.5	36	61.0
Bulgaria	0.0	18.5	63.5	30	49.8
Sample	0.0	20.0	50.0	489	

Notes: ¹⁾ Lowest 5%. ²⁾ Highest 5%. ³⁾ Significance levels of Kruskal-Wallis test: * 10%, ** 5%, and *** 1%.

⁴⁾ -- Not calculated for lack of sufficient observations.

Source: Own calculation with data from project survey.

Table A 26: Inter-country differences within SFH types for the variable "importance of maximising annual cash balance (points)"

	P ₅ ¹⁾	Median	P ₉₅ ²⁾	N	Mean rank/Sig. ³⁾
Rural diversifiers ⁴⁾	0.0	5.0	43.9	150	***
Poland	0.0	5.0	--	8	73.8
Romania	0.0	0.0	29.0	63	44.8
Bulgaria	0.0	14.0	48.0	79	100.3
Rural pensioners	0.0	14.0	40.0	83	***
Poland	0.0	10.0	--	10	29.9
Romania	0.0	0.0	--	12	27.5
Bulgaria	0.0	16.0	39.0	61	46.9
Farmers	0.0	10.0	33.0	153	**
Poland	0.0	5.0	40.0	103	70.5
Romania	0.0	15.0	30.0	42	88.2
Bulgaria	1.0	15.0	--	8	102.5
Rural newcomers	0.0	10.0	45.6	103	***
Poland	0.0	5.0	51.0	37	38.8
Romania	0.0	17.5	41.5	36	57.7
Bulgaria	0.0	15.0	43.2	30	61.5
Sample	0.0	10.0	40.0	489	

Notes: ¹⁾ Lowest 5% ²⁾ Highest 5% ³⁾ Significance levels of Kruskal-Wallis test: * 10%, ** 5%, and *** 1%. ⁴⁾ -- Not calculated for lack of sufficient observations.

Source: Own calculation with data from project survey.

Table A 27: Inter-country differences within SFH types for the variable "importance of minimising agricultural labour input (points)"

	P ₅ ¹⁾	Median	P ₉₅ ²⁾	N	Mean rank/Sig. ³⁾
Rural diversifiers ⁴⁾	0.0	20.0	89.0	150	***
Poland	0.0	7.5	--	8	51.4
Romania	0.0	40.0	100.0	63	98.5
Bulgaria	0.0	12.0	41.0	79	59.6
Rural pensioners	0.0	20.0	68.0	83	**
Poland	0.0	22.5	--	10	41.6
Romania	10.0	35.0	--	12	59.7
Bulgaria	0.0	19.0	47.9	61	38.6
Farmers	0.0	10.0	40.0	153	***
Poland	0.0	10.0	48.0	103	69.9
Romania	5.0	15.0	40.0	42	95.4
Bulgaria	1.0	11.0	--	8	71.6
Rural newcomers	0.0	10.0	50.0	103	***
Poland	0.0	5.0	32.0	37	38.0
Romania	5.0	20.0	71.5	36	71.2
Bulgaria	0.0	10.0	43.4	30	46.2
Sample	0.0	15.0	60.0	489	

Notes: ¹⁾ Lowest 5%. ²⁾ Highest 5%. ³⁾ Significance levels of Kruskal-Wallis test: * 10%, ** 5%, and *** 1%.

⁴⁾ -- Not calculated for lack of sufficient observations.

Source: Own calculation with data from project survey.

Table A 28: Inter-country differences within SFH types for the variable "aim: diversify income sources (scale)"

	P ₅ ¹⁾	Median	P ₉₅ ²⁾	N	Mean rank/Sig. ³⁾
Rural diversifiers ⁴⁾	1.0	5.0	5.0	150	***
Poland	2.0	4.0	--	8	56.5
Romania	3.0	5.0	5.0	63	91.4
Bulgaria	1.0	4.0	5.0	79	64.8
Rural pensioners	1.0	4.0	5.0	83	
Poland	1.0	3.5	--	10	43.3
Romania	2.0	4.5	--	12	54.8
Bulgaria	1.0	4.0	5.0	61	39.3
Farmers	1.0	4.0	5.0	153	***
Poland	1.0	4.0	5.0	103	70.0
Romania	1.2	5.0	5.0	42	97.3
Bulgaria	1.0	3.5	--	8	61.4
Rural newcomers	1.0	4.0	5.0	103	*
Poland	1.0	4.0	5.0	37	53.3
Romania	1.0	5.0	5.0	36	58.2
Bulgaria	1.0	3.0	5.0	30	42.9
Sample	1.0	4.0	5.0	489	

Notes: ¹⁾ Lowest 5% ²⁾ Highest 5% ³⁾ Significance levels of Kruskal-Wallis test: * 10%, ** 5%, and *** 1%. ⁴⁾ -- Not calculated for lack of sufficient observations.

Source: Own calculation with data from project survey.

Table A 29: Inter-country differences within SFH types for the variable "aim: be rooted to the soil (scale)"

	P ₅ ¹⁾	Median	P ₉₅ ²⁾	N	Mean rank/Sig. ³⁾
Rural diversifiers ⁴⁾	1.0	4.0	5.0	150	*
Poland	1.0	3.0	--	8	42.1
Romania	1.2	4.0	5.0	63	78.5
Bulgaria	1.0	4.0	5.0	79	76.5
Rural pensioners	1.0	4.0	5.0	83	
Poland	1.0	4.5	--	10	46.7
Romania	1.0	4.0	--	12	39.0
Bulgaria	1.0	4.0	5.0	61	41.8
Farmers	1.0	4.0	5.0	153	***
Poland	1.0	4.0	5.0	103	70.0
Romania	3.0	5.0	5.0	42	100.3
Bulgaria	1.0	1.5	--	8	45.2
Rural newcomers	1.0	5.0	5.0	103	
Poland	1.0	4.0	5.0	37	45.8
Romania	1.0	5.0	5.0	36	59.3
Bulgaria	1.0	5.0	5.0	30	50.8
Sample	1.0	4.0	5.0	489	

Notes: ¹⁾ Lowest 5% ²⁾ Highest 5% ³⁾ Significance levels of Kruskal-Wallis test: * 10%, ** 5%, and *** 1%. ⁴⁾ -- Not calculated for lack of sufficient observations.

Source: Own calculation with data from project survey.

Table A 30: Inter-country differences within SFH types for the variable "aim: enjoy rural lifestyle (scale)"

	P ₅ ¹⁾	Median	P ₉₅ ²⁾	N	Mean rank/Sig. ³⁾
Rural diversifiers ⁴⁾	1.0	4.0	5.0	150	**
Poland	2.0	3.5	--	8	61.3
Romania	1.2	5.0	5.0	63	86.6
Bulgaria	1.0	4.0	5.0	79	68.1
Rural pensioners	1.0	4.0	5.0	83	
Poland	2.0	3.5	--	10	36.8
Romania	2.0	5.0	--	12	53.0
Bulgaria	1.0	4.0	5.0	61	40.7
Farmers	1.7	4.0	5.0	153	***
Poland	2.0	4.0	5.0	103	70.3
Romania	3.2	5.0	5.0	42	101.2
Bulgaria	1.0	1.5	--	8	36.6
Rural newcomers	1.0	4.0	5.0	103	***
Poland	1.0	4.0	5.0	37	48.9
Romania	3.0	5.0	5.0	36	66.7
Bulgaria	1.0	4.0	5.0	30	38.2
Sample	1.0	4.0	5.0	489	

Notes: ¹⁾ Lowest 5%. ²⁾ Highest 5%. ³⁾ Significance levels of Kruskal-Wallis test: * 10%, ** 5%, and *** 1%.

⁴⁾ -- Not calculated for lack of sufficient observations.

Source: Own calculation with data from project survey.

Table A 31: Inter-country differences within SFH types for the variable "aim: be respected in the village (scale)"

	P ₅ ¹⁾	Median	P ₉₅ ²⁾	N	Mean rank/Sig. ³⁾
Rural diversifiers ⁴⁾	3.0	5.0	5.0	150	***
Poland	3.0	4.0	--	8	40.9
Romania	3.0	5.0	5.0	63	79.8
Bulgaria	3.0	5.0	5.0	79	75.5
Rural pensioners	3.2	5.0	5.0	83	
Poland	4.0	5.0	--	10	35.2
Romania	1.0	5.0	--	12	36.3
Bulgaria	4.0	5.0	5.0	61	44.2
Farmers	3.0	5.0	5.0	153	
Poland	3.0	5.0	5.0	103	74.6
Romania	3.2	5.0	5.0	42	82.3
Bulgaria	1.0	5.0	--	8	80.4
Rural newcomers	3.0	5.0	5.0	103	
Poland	3.0	5.0	5.0	37	52.2
Romania	3.0	5.0	5.0	36	56.4
Bulgaria	1.0	5.0	5.0	30	46.5
Sample	3.0	5.0	5.0	489	

Notes: ¹⁾ Lowest 5%. ²⁾ Highest 5%. ³⁾ Significance levels of Kruskal-Wallis test: * 10%, ** 5%, and *** 1%.

⁴⁾ -- Not calculated for lack of sufficient observations.

Source: Own calculation with data from project survey.

Table A 32: Inter-country differences within SFH types for the variable "aim: conserve the heritage (scale)"

	P ₅ ¹⁾	Median	P ₉₅ ²⁾	N	Mean rank/Sig. ³⁾
Rural diversifiers ⁴⁾	2.0	5.0	5.0	150	***
Poland	1.0	2.5	--	8	42.0
Romania	2.0	4.0	5.0	63	68.1
Bulgaria	2.0	5.0	5.0	79	84.8
Rural pensioners	1.0	5.0	5.0	83	***
Poland	1.0	2.0	--	10	15.4
Romania	2.0	4.5	--	12	39.8
Bulgaria	1.1	5.0	5.0	61	46.8
Farmers	2.0	4.0	5.0	153	***
Poland	2.0	4.0	5.0	103	64.9
Romania	3.0	5.0	5.0	42	104.1
Bulgaria	1.0	5.0	--	8	90.4
Rural newcomers	1.0	4.0	5.0	103	
Poland	1.0	4.0	5.0	37	46.4
Romania	1.9	4.0	5.0	36	58.7
Bulgaria	1.0	4.0	5.0	30	51.0
Sample	1.0	4.0	5.0	489	

Notes: ¹⁾ Lowest 5%. ²⁾ Highest 5%. ³⁾ Significance levels of Kruskal-Wallis test: * 10%, ** 5%, and *** 1%.

⁴⁾ -- Not calculated for lack of sufficient observations.

Source: Own calculation with data from project survey.

Table A 33: Inter-country differences within SFH types for the variable "aim: keep up the family's traditions (scale)"

	P ₅ ¹⁾	Median	P ₉₅ ²⁾	N	Mean rank/Sig. ³⁾
Rural diversifiers ⁴⁾	1.6	4.0	5.0	150	
Poland	2.0	3.0	--	8	47.7
Romania	2.0	4.0	5.0	63	75.4
Bulgaria	1.0	5.0	5.0	79	78.4
Rural pensioners	1.2	5.0	5.0	83	**
Poland	1.0	3.0	--	10	23.2
Romania	2.0	4.0	--	12	42.0
Bulgaria	1.1	5.0	5.0	61	45.1
Farmers	1.7	4.0	5.0	153	**
Poland	1.2	4.0	5.0	103	70.6
Romania	3.0	5.0	5.0	42	93.4
Bulgaria	1.0	4.5	--	8	73.4
Rural newcomers	1.0	4.0	5.0	103	
Poland	1.0	4.0	5.0	37	49.5
Romania	1.0	4.0	5.0	36	56.1
Bulgaria	1.0	4.0	5.0	30	50.1
Sample	1.0	4.0	5.0	489	

Notes: ¹⁾ Lowest 5%. ²⁾ Highest 5%. ³⁾ Significance levels of Kruskal-Wallis test: * 10%, ** 5%, and *** 1%.

⁴⁾ -- Not calculated for lack of sufficient observations.

Source: Own calculation with data from project survey.

Table A 34: Inter-country differences within SFH types for the variable "aim: provide children with a good/higher education (scale)"

	P ₅ ¹⁾	Median	P ₉₅ ²⁾	N	Mean rank/Sig. ³⁾
Rural diversifiers ⁴⁾	1.0	5.0	5.0	150	***
Poland	1.0	5.0	--	8	79.9
Romania	1.0	5.0	5.0	63	90.3
Bulgaria	1.0	5.0	5.0	79	63.2
Rural pensioners	1.0	4.0	5.0	83	
Poland	1.0	5.0	--	10	51.0
Romania	1.0	4.0	--	12	40.5
Bulgaria	1.0	4.0	5.0	61	40.8
Farmers	1.0	5.0	5.0	153	***
Poland	1.0	5.0	5.0	103	73.7
Romania	5.0	5.0	5.0	42	94.0
Bulgaria	1.0	1.0	--	8	30.6
Rural newcomers	1.0	5.0	5.0	103	**
Poland	1.0	5.0	5.0	37	50.8
Romania	4.0	5.0	5.0	36	59.0
Bulgaria	1.0	5.0	5.0	30	45.1
Sample	1.0	5.0	5.0	489	

Notes: ¹⁾ Lowest 5% ²⁾ Highest 5% ³⁾ Significance levels of Kruskal-Wallis test: * 10%, ** 5%, and *** 1%. ⁴⁾ -- Not calculated for lack of sufficient observations.

Source: Own calculation with data from project survey.

Table A 35: Inter-country differences within SFH types for the variable "aim: avoid taking advances (scale)"

	P ₅ ¹⁾	Median	P ₉₅ ²⁾	N	Mean rank/Sig. ³⁾
Rural diversifiers ⁴⁾	1.0	4.00	5.00	150	
Poland	2.0	3.5	--	8	62.6
Romania	1.0	4.0	5.0	63	73.4
Bulgaria	1.0	4.0	5.0	79	78.5
Rural pensioners	1.0	5.0	5.0	83	*
Poland	1.0	3.0	--	10	26.6
Romania	1.0	5.0	--	12	41.5
Bulgaria	1.0	5.0	5.0	61	44.6
Farmers	1.0	4.0	5.0	153	*
Poland	1.0	4.0	5.0	103	72.5
Romania	1.0	5.0	5.0	42	90.1
Bulgaria	1.0	3.5	--	8	65.8
Rural newcomers	1.0	4.0	5.0	103	**
Poland	1.0	4.0	5.0	37	47.1
Romania	1.9	5.0	5.0	36	63.3
Bulgaria	1.0	4.0	5.0	30	44.5
Sample	1.0	4.0	5.0	489	

Notes: ¹⁾ Lowest 5%. ²⁾ Highest 5%. ³⁾ Significance levels of Kruskal-Wallis test: * 10%, ** 5%, and *** 1%.

⁴⁾ -- Not calculated for lack of sufficient observations.

Source: Own calculation with data from project survey.

Table A 36: Inter-country differences within SFH types for the variable "aim: have time for leisure activities (scale)"

	P ₅ ¹⁾	Median	P ₉₅ ²⁾	N	Mean rank/Sig. ³⁾
Rural diversifiers ⁴⁾	2.0	5.0	5.0	150	***
Poland	2.0	3.5	--	8	48.5
Romania	3.0	5.0	5.0	63	85.9
Bulgaria	1.0	4.0	5.0	79	69.9
Rural pensioners	1.0	4.0	5.0	83	
Poland	3.0	4.0	--	10	39.3
Romania	2.0	4.5	--	12	41.5
Bulgaria	1.0	4.0	5.0	61	42.6
Farmers	3.0	5.0	5.0	153	**
Poland	3.0	5.0	5.0	103	75.5
Romania	3.0	5.0	5.0	42	86.1
Bulgaria	1.0	3.5	--	8	49.1
Rural newcomers	1.0	4.0	5.0	103	*
Poland	2.0	5.0	5.0	37	56.0
Romania	1.9	5.0	5.0	36	56.5
Bulgaria	1.0	4.0	5.0	30	41.7
Sample	2.0	5.0	5.0	489	

Notes: ¹⁾ Lowest 5%. ²⁾ Highest 5%. ³⁾ Significance levels of Kruskal-Wallis test: * 10%, ** 5%, and *** 1%.

⁴⁾ -- Not calculated for lack of sufficient observations.

Source: Own calculation with data from project survey.

Table A 37: Inter-country differences within SFH types for the variable "future intentions of the household concerning the farm: stop farming"

	Per cent ¹⁾	N	Sig. ²⁾
Rural diversifiers	2.0	3	***
Poland	0.0	0	
Romania	0.0	0	
Bulgaria	3.8	3	
Rural pensioners	8.4	7	**
Poland	20.0	2	
Romania	8.3	1	
Bulgaria	6.6	4	
Farmers	10.5	16	***
Poland	9.7	10	
Romania	14.3	6	
Bulgaria	0.0	0	
Rural newcomers	3.9	4	
Poland	5.4	2	
Romania	2.8	1	
Bulgaria	3.4	1	
Sample	6.1	30	

Notes: ¹⁾ Percentage of households that selected the option. ²⁾ Significance levels for Chi² test: * 10%, ** 5%, and *** 1%.

Source: Own calculation with data from project survey.

Table A 38: Inter-country differences within SFH types for the variable “future intentions of the household concerning the farm: keep the farm for subsistence production”

	Per cent ¹⁾	N	Sig. ²⁾
Rural diversifiers	18.8	28	***
Poland	37.5	3	
Romania	12.7	8	
Bulgaria	21.8	17	
Rural pensioners	26.5	22	**
Poland	30.0	3	
Romania	16.7	2	
Bulgaria	27.9	17	
Farmers	9.8	15	***
Poland	5.8	6	
Romania	19.0	8	
Bulgaria	12.5	1	
Rural newcomers	9.8	10	
Poland	10.8	4	
Romania	13.9	5	
Bulgaria	3.4	1	
Sample	15.3	75	

Notes: ¹⁾ Percentage of households that selected the option. ²⁾ Significance levels for Chi² test: * 10%, ** 5%, and *** 1%.

Source: Own calculation with data from project survey.

Table A 39: Inter-country differences within SFH types for the variable "future intentions of the household concerning the farm: reduce farming activities"

	Per cent ¹⁾	N	Sig. ²⁾
Rural diversifiers	2.0	3	***
Poland	0.0	0	
Romania	1.6	1	
Bulgaria	2.6	2	
Rural pensioners	4.8	4	**
Poland	0.0	0	
Romania	0.0	0	
Bulgaria	6.6	4	
Farmers	7.2	11	***
Poland	6.8	7	
Romania	4.8	2	
Bulgaria	25.0	2	
Rural newcomers	2.0	2	
Poland	0.0	0	
Romania	0.0	0	
Bulgaria	6.9	2	
Sample	4.1	20	

Notes: ¹⁾ Percentage of households that selected the option. ²⁾ Significance levels for Chi² test: * 10%, ** 5%, and *** 1%.

Source: Own calculation with data from project survey.

Table A 40: Inter-country differences within SFH types for the variable "future intentions of the household concerning the farm: continue as it is"

	Per cent ¹⁾	N	Sig. ²⁾
Rural diversifiers	36.9	55	***
Poland	25.0	2	
Romania	30.2	19	
Bulgaria	43.6	34	
Rural pensioners	32.5	27	**
Poland	30.0	3	
Romania	25.0	3	
Bulgaria	34.4	21	
Farmers	28.1	43	***
Poland	30.1	31	
Romania	23.8	10	
Bulgaria	25.0	2	
Rural newcomers	28.4	29	
Poland	40.5	15	
Romania	22.2	8	
Bulgaria	20.7	6	
Sample	31.5	154	

Notes: ¹⁾ Percentage of households that selected the option. ²⁾ Significance levels for Chi² test: * 10%, ** 5%, and *** 1%.

Source: Own calculation with data from project survey.

Table A 41: Inter-country differences within SFH types for the variable "future intentions of the household concerning the farm: modernise without extension"

	Per cent ¹⁾	N	Sig. ²⁾
Rural diversifiers	23.5	35	***
Poland	0.0	0	
Romania	49.2	31	
Bulgaria	5.1	4	
Rural pensioners	8.4	7	**
Poland	0.0	0	
Romania	41.7	5	
Bulgaria	3.3	2	
Farmers	17.6	27	***
Poland	17.5	18	
Romania	21.4	9	
Bulgaria	0.0	0	
Rural newcomers	22.5	23	
Poland	21.6	8	
Romania	30.6	11	
Bulgaria	13.8	4	
Sample	18.8	92	

Notes: ¹⁾ Percentage of households that selected the option. ²⁾ Significance levels for Chi² test: * 10%, ** 5%, and *** 1%.

Source: Own calculation with data from project survey.

Table A 42: Inter-country differences within SFH types for the variable “future intentions of the household concerning the farm: extend farming without modernisation”

	Per cent ¹⁾	N	Sig. ²⁾
Rural diversifiers	12.1	18	***
Poland	25.0	2	
Romania	6.3	4	
Bulgaria	15.4	12	
Rural pensioners	8.4	7	**
Poland	10.0	1	
Romania	0.0	0	
Bulgaria	9.8	6	
Farmers	17.0	26	***
Poland	22.3	23	
Romania	7.1	3	
Bulgaria	0.0	0	
Rural newcomers	13.7	14	
Poland	10.8	4	
Romania	13.9	5	
Bulgaria	17.2	5	
Sample	13.3	65	

Notes: ¹⁾ Percentage of households that selected the option. ²⁾ Significance levels for Chi² test: * 10%, ** 5%, and *** 1%.

Source: Own calculation with data from project survey.

Table A 43: Inter-country differences within SFH types for the variable "future intentions of the household concerning the farm: extend farming with modernisation"

	Per cent ¹⁾	N	Sig. ²⁾
Rural diversifiers	4.0	6	***
Poland	12.5	1	
Romania	0.0	0	
Bulgaria	6.4	5	
Rural pensioners	9.6	8	**
Poland	10.0	1	
Romania	8.3	1	
Bulgaria	9.8	6	
Farmers	9.2	14	***
Poland	7.8	8	
Romania	9.5	4	
Bulgaria	25.0	2	
Rural newcomers	19.6	20	
Poland	10.8	4	
Romania	16.7	6	
Bulgaria	34.5	10	
Sample	9.8	48	

Notes: ¹⁾ Percentage of households that selected the option. ²⁾ Significance levels for Chi² test: * 10%, ** 5%, and *** 1%.

Source: Own calculation with data from project survey.

Table A 44: Inter-country differences within SFH types for the variable “knowing the transitional semi-subsistence measure (households answering “yes”)”

	Per cent ¹⁾	N	Sig. ²⁾
Rural diversifiers	18.8	26	***
Poland	87.5	7	
Romania	0.0	0	
Bulgaria	24.4	19	
Rural pensioners	30.4	24	***
Poland	90.0	9	
Romania	0.0	0	
Bulgaria	24.6	15	
Farmers	74.6	103	***
Poland	96.1	99	
Romania	0.0	0	
Bulgaria	50.0	4	
Rural newcomers	48.3	42	***
Poland	91.9	34	
Romania	0.0	0	
Bulgaria	27.6	8	
Sample	44.1	195	

Notes: ¹⁾ Percentage of households answering “yes”. ²⁾ Significance levels for Chi² test: * 10%, ** 5%, and *** 1%.

Source: Own calculation with data from project survey.

Table A 45: Inter-country differences within SFH types for the variable "intended future application for the transitional semi-subsistence measure (households answering "yes")"

	Per cent ¹⁾	N	Sig. ²⁾
Rural diversifiers	22.3	29	***
Poland	0.0	0	
Romania	0.0	0	
Bulgaria	37.7	29	
Rural pensioners	41.4	29	**
Poland	0.0	0	
Romania	0.0	0	
Bulgaria	47.5	29	
Farmers	15.4	6	***
Poland	50.0	2	
Romania	0.0	0	
Bulgaria	50.0	4	
Rural newcomers	49.1	26	***
Poland	66.7	2	
Romania	0.0	0	
Bulgaria	82.8	24	
Sample	30.8	90	

Notes: ¹⁾ Percentage of households answering "yes". ²⁾ Significance levels for Chi² test: * 10%, ** 5%, and *** 1%.

Source: Own calculation with data from project survey.

Table A 46: Inter-country differences within SFH types for the variable “viability considering earned net income (ratio)”

	P ₅ ¹⁾	Median	P ₉₅ ²⁾	N	Mean rank/Sig. ³⁾
Rural diversifiers ⁴⁾	0.10	0.63	1.60	150	
Poland	0.43	0.93	--	8	102.6
Romania	0.20	0.60	1.61	63	75.3
Bulgaria	0.05	0.61	1.54	79	72.9
Rural pensioners	-0.41	0.08	0.71	83	**
Poland	-0.19	-0.03	--	10	30.0
Romania	-0.89	0.27	--	12	55.4
Bulgaria	-0.42	0.08	0.60	61	41.3
Farmers	-0.23	0.48	1.58	153	
Poland	-0.12	0.51	1.43	103	80.1
Romania	-0.53	0.42	2.16	42	68.7
Bulgaria	-2.30	0.63	--	8	80.4
Rural newcomers	-0.28	0.39	1.31	103	
Poland	-0.35	0.45	1.32	37	54.7
Romania	-0.28	0.39	1.18	36	50.8
Bulgaria	-0.72	0.27	1.66	30	50.1
Sample	-0.19	0.45	1.45	489	

Notes: ¹⁾ Lowest 5%. ²⁾ Highest 5%. ³⁾ Significance levels of Kruskal-Wallis test: * 10%, ** 5%, and *** 1%.

⁴⁾ -- Not calculated for lack of sufficient observations.

Source: Own calculation with data from project survey.

Table A 47: Inter-country differences within SFH types for the variable "viability considering earned net income plus received subsidies (ratio)"

	P ₅ ¹⁾	Median	P ₉₅ ²⁾	N	Mean rank/Sig. ³⁾
Rural diversifiers ⁴⁾	0.11	0.69	1.66	150	***
Poland	0.74	1.35	--	8	123.9
Romania	0.23	0.67	1.72	63	77.0
Bulgaria	0.05	0.65	1.54	79	69.4
Rural pensioners	-0.35	0.16	0.79	83	*
Poland	-0.01	0.19	--	10	48.4
Romania	-0.86	0.32	--	12	55.4
Bulgaria	-0.35	0.08	0.62	61	38.3
Farmers	-0.15	0.81	2.04	153	***
Poland	0.34	0.96	2.26	103	89.8
Romania	-0.51	0.42	2.21	42	49.1
Bulgaria	-2.30	0.63	--	8	59.3
Rural newcomers	-0.15	0.50	1.50	103	***
Poland	0.02	0.72	1.45	37	65.1
Romania	-0.28	0.40	1.70	36	45.0
Bulgaria	-0.62	0.28	1.68	30	44.3
Sample	-0.14	0.57	1.68	489	

Notes: ¹⁾ Lowest 5%. ²⁾ Highest 5%. ³⁾ Significance levels of Kruskal-Wallis test: * 10%, ** 5%, and *** 1%.

⁴⁾ -- Not calculated for lack of sufficient observations.

Source: Own calculation with data from project survey.

Table A 48: Inter-country differences within SFH types for the variable “viability considering earned net income plus received social security benefits (ratio)”

	P ₅ ¹⁾	Median	P ₉₅ ²⁾	N	Mean rank/Sig. ³⁾
Rural diversifiers ⁴⁾	0.22	0.81	1.65	150	
Poland	0.60	1.14	--	8	102.8
Romania	0.29	0.82	1.61	63	73.4
Bulgaria	0.12	0.80	1.88	79	74.4
Rural pensioners	-0.06	0.59	1.52	83	*
Poland	0.10	0.33	--	10	28.8
Romania	-0.07	0.78	--	12	53.0
Bulgaria	-0.10	0.61	1.33	61	42.0
Farmers	-0.14	0.67	1.72	153	
Poland	-0.10	0.71	1.56	103	79.6
Romania	-0.27	0.57	2.27	42	69.0
Bulgaria	-1.97	1.06	--	8	85.1
Rural newcomers	-0.23	0.53	1.61	103	
Poland	-0.25	0.75	1.72	37	56.9
Romania	-0.28	0.52	1.72	36	47.3
Bulgaria	-0.42	0.45	2.26	30	51.6
Sample	-0.07	0.68	1.65	489	

Notes: ¹⁾ Lowest 5%. ²⁾ Highest 5%. ³⁾ Significance levels of Kruskal-Wallis test: * 10%, ** 5%, and *** 1%.

⁴⁾ -- Not calculated for lack of sufficient observations.

Source: Own calculation with data from project survey.

Table A 49: Inter-country differences within SFH types for the variable "viability considering household net income (ratio)"

	P ₅ ¹⁾	Median	P ₉₅ ²⁾	N	Mean rank/Sig. ³⁾
Rural diversifiers ⁴⁾	0.25	0.89	1.84	150	**
Poland	0.74	1.63	--	8	119.4
Romania	0.35	0.91	1.72	63	74.0
Bulgaria	0.21	0.83	1.90	79	72.2
Rural pensioners	-0.04	0.65	1.58	83	
Poland	0.36	0.62	--	10	41.6
Romania	-0.04	0.81	--	12	52.3
Bulgaria	-0.10	0.63	1.50	61	40.1
Farmers	0.18	1.09	2.37	153	***
Poland	0.34	1.22	2.42	103	87.5
Romania	-0.16	0.61	2.33	42	50.5
Bulgaria	-1.96	1.19	--	8	81.8
Rural newcomers	-0.14	0.65	1.73	103	***
Poland	0.21	0.87	1.85	37	65.4
Romania	-0.19	0.53	2.08	36	42.4
Bulgaria	-0.32	0.51	2.28	30	47.0
Sample	0.08	0.83	1.89	489	

Notes: ¹⁾ Lowest 5%. ²⁾ Highest 5%. ³⁾ Significance levels of Kruskal-Wallis test: * 10%, ** 5%, and *** 1%.

⁴⁾ -- Not calculated for lack of sufficient observations.

Source: Own calculation with data from project survey.

Annex 4: Description of Model SFHs and Parameter Assumptions used for Simulations

Table A 50: Description of the rural diversifiers' households selected for simulation

Variable	Value	Deviation from median of all rural diversifiers (value-median)	Deviation from standardised mean value of all rural diversifiers (z value - z median)
Dependency ratio (ratio)			
Poland	0.00	0.00	0.005
Romania	0.00	0.00	0.005
Bulgaria	0.50	0.50	0.717
Highest formal schooling in the household (scale) ¹⁾			
Poland	7	2	1.487
Romania	6	1	0.744
Bulgaria	5	0	0.00001
Agricultural qualification of farm operator (scale) ²⁾			
Poland	2	1	0.798
Romania	3	2	1.591
Bulgaria	1	0	0.005
Age of farm operator (years)			
Poland	52	-2	-0.165
Romania	56	2	0.156
Bulgaria	51	-3	-0.245
Farm operator's experience as farm manager (years)			
Poland	17	1	0.110
Romania	35	19	2.142
Bulgaria	10	-6	-0.680
Share of net non-farm income in household net income (per cent)			
Poland	53.79	-12	-0.377
Romania	79.01	13.22	0.414
Bulgaria	69.39	3.6	0.112
Share of own-consumed agricultural production in total agricultural production (%)			
Poland	36.67	-31.98	-1.259
Romania	60.70	7.95	-0.312
Bulgaria	91.46	22.81	0.900
Household cash balance (EUR)			
Poland	1,464.15	2,189.43	0.727
Romania	-2,176.44	-1,451.16	-0.481
Bulgaria	-108.94	616.34	0.205
Economic farm size (EUR)			
Poland	2,737.28	-87.26	-0.038
Romania	2,262.77	-561.77	-0.218
Bulgaria	1,811.25	-1,013.29	-0.390
Cultivated agricultural area per household (ha)			
Poland	4.19	1.12	0.283
Romania	2.20	-0.87	-0.221
Bulgaria	2.61	-0.46	-0.117
Share of crop production in total agricultural production (per cent)			
Poland	28.09	-11.68	-0.424
Romania	48.02	8.25	0.301
Bulgaria	48.80	9.03	0.330
Number of agricultural products (number)			
Poland	9	-8	-1.465
Romania	14	-3	-0.551
Bulgaria	21	4	0.730
Share of social security benefits in net household income (per cent)			
Poland	0.00	-10.51	-0.409
Romania	0.00	0.00	-0.409
Bulgaria	17.06	6.55	0.247

Notes: ¹⁾ 0: no studies and cannot read or write, 1: no studies but can read and write, 2: elementary school, 3: vocational school, 4: secondary school, grammar school, 5: other occupation-specific higher education, 6: B.Sc., 7: M.Sc., 8: post graduate studies, 9: Ph.D. ²⁾ 1: none/only practical experience, 2: only short courses, 3: agricultural vocational school, 4: agricultural secondary school, 5: agricultural graduate studies, 6: post graduate studies.

Source: Own calculation with data from project survey.

Table A 51: Description of the rural pensioners' households selected for simulation

Variable	Value	Deviation from median of all rural pensioners (value-median)	Deviation from standardised mean value of all rural pensioners (z value - z median)
Dependency ratio (ratio)			
Poland	1.00	0.00	0.0001
Romania	1.00	0.00	0.0001
Bulgaria	0.00	-1.00	-1.425
Highest formal schooling in the household (scale) ¹⁾			
Poland	4	4	-0.004
Romania	4	0	-0.004
Bulgaria	4	0	-0.004
Agricultural qualification of farm operator (scale) ²⁾			
Poland	2	1	0.798
Romania	3	2	1.591
Bulgaria	1	0	0.005
Age of farm operator (years)			
Poland	69	4	0.321
Romania	66	1	0.080
Bulgaria	62	-3	-0.241
Farm operator's experience as farm manager (years)			
Poland	40	23	2.597
Romania	20	3	0.339
Bulgaria	17	0	0.00005
Share of net non-farm income in household net income (per cent)			
Poland	0.00	0.00	-0.004
Romania	0.00	0.00	-0.004
Bulgaria	0.00	0.00	-0.004
Share of own-consumed agricultural production in total agricultural production (per cent)			
Poland	63.48	-1.08	-0.042
Romania	99.58	35.02	1.381
Bulgaria	68.29	3.73	0.147
Household's cash balance (EUR)			
Poland	-951.21	96.57	0.036
Romania	960.63	2,008.41	0.670
Bulgaria	-803.18	247.60	0.085
Economic farm size (EUR)			
Poland	3,306.03	1,649.63	0.629
Romania	2,667.74	1,011.34	0.386
Bulgaria	1,781.37	124.97	0.048
Cultivated agricultural area per household (ha)			
Poland	8.20	7.12	1.799
Romania	2.64	1.56	0.391
Bulgaria	0.04	-1.04	-0.268
Share of crop production in total agricultural production (per cent)			
Poland	41.43	8.69	0.321
Romania	48.79	16.05	0.589
Bulgaria	37.34	4.6	0.172
Number of agricultural products (number)			
Poland	11	-3	-0.550
Romania	23	9	1.646
Bulgaria	19	5	0.914
Share of social security benefits in net household income (per cent)			
Poland	61.28	-3.28	-0.124
Romania	62.20	-2.36	-0.089
Bulgaria	66.93	2.37	0.093

Notes: ¹⁾ 0: no studies and cannot read or write, 1: no studies but can read and write, 2: elementary school, 3: vocational school, 4: secondary school, grammar school, 5: other occupation-specific higher education, 6: B.Sc., 7: M.Sc., 8: post graduate studies, 9: Ph.D. ²⁾ 1: none/only practical experience, 2: only short courses, 3: agricultural vocational school, 4: agricultural secondary school, 5: agricultural graduate studies, 6: post graduate studies.

Source: Own calculation with data from project survey.

Table A 52: Description of the farmer households selected for simulation

Variable	Value	Deviation from median of all farmers (value-median)	Deviation from standardised mean value of all farmers (z value - z median)
Dependency ratio (ratio)			
Poland	0.00	0.00	0.005
Romania	0.00	0.00	0.005
Bulgaria	0.00	0.00	0.005
Highest formal schooling in the household (scale) ¹⁾			
Poland	4	0	-0.004
Romania	3	-1	-0.747
Bulgaria	4	4	-0.004
Agricultural qualification of farm operator (scale) ²⁾			
Poland	1	0	-0.795
Romania	2	0	-0.002
Bulgaria	1	-1	-0.795
Age of farm operator (years)			
Poland	40	-10	-0.799
Romania	58	8	0.647
Bulgaria	59	9	0.727
Farm operator's experience as farm manager (years)			
Poland	20	2	0.229
Romania	16	-2	-0.223
Bulgaria	18	0	0.003
Share of net non-farm income in household net income (per cent)			
Poland	33.73	33.73	1.054
Romania	0.00	0.00	-0.004
Bulgaria	17.61	17.61	0.548
Share of own-consumed agricultural production in total agricultural production (per cent)			
Poland	36.82	-2.02	-0.083
Romania	76.61	37.77	1.485
Bulgaria	43.02	4.18	0.161
Household's cash balance (EUR)			
Poland	-63.86	-133.9	-0.040
Romania	-907.94	-977.98	-0.320
Bulgaria	408.53	338.49	0.117
Economic farm size (EUR)			
Poland	4,854.44	186.58	0.068
Romania	3,794.96	-872.9	-0.335
Bulgaria	3,374.52	-1,293.34	-0.495
Cultivated agricultural area per household (ha)			
Poland	8.49	1.45	0.372
Romania	7.00	-0.04	-0.005
Bulgaria	15.45	8.41	2.135
Share of crop production in total agricultural production (per cent)			
Poland	39.97	-15	-0.542
Romania	76.39	21.42	0.784
Bulgaria	40.46	-14.51	-0.524
Number of agricultural products (number)			
Poland	9	-1	-0.185
Romania	9	-1	-0.185
Bulgaria	19	9	1.644
Share of social security benefits in net household income (per cent)			
Poland	12.05	3.74	0.144
Romania	0.00	-8.31	-0.319
Bulgaria	35.22	26.91	1.034

Notes: ¹⁾ 0: no studies and cannot read or write, 1: no studies but can read and write, 2: elementary school, 3: vocational school, 4: secondary school, grammar school, 5: other occupation-specific higher education, 6: B.Sc., 7: M.Sc., 8: post graduate studies, 9: Ph.D. ²⁾ 1: none/only practical experience, 2: only short courses, 3: agricultural vocational school, 4: agricultural secondary school, 5: agricultural graduate studies, 6: post graduate studies.

Source: Own calculation with data from project survey.

Table A 53: Description of the rural newcomers' households selected for simulation

Variable	Value	Deviation from median of all rural newcomers (value-median)	Deviation from standardised mean value of all rural newcomers (z value - z median)
Dependency ratio (ratio)			
Poland	0.00	-0.33	-0.475
Romania	1.00	0.67	0.950
Bulgaria	0.00	-0.33	-0.475
Highest formal schooling in the household (scale) ¹⁾			
Poland	3	-1	-0.747
Romania	3	-1	-0.747
Bulgaria	4	0	-0.004
Agricultural qualification of farm operator (scale) ²⁾			
Poland	1	0	0.005
Romania	1	0	0.005
Bulgaria	1	0	0.005
Age of farm operator (years)			
Poland	33	-2	-0.162
Romania	33	-2	-0.162
Bulgaria	37	2	0.159
Farm operator's experience as farm manager (years)			
Poland	13	4	0.448
Romania	10	1	0.110
Bulgaria	17	8	0.900
Share of net non-farm income in household net income (per cent)			
Poland	24.98	-1.09	-0.031
Romania	0.00	-26.07	-0.814
Bulgaria	33.80	7.73	0.246
Share of own-consumed agricultural production in total agricultural production (per cent)			
Poland	33.45	-7.44	-0.296
Romania	62.99	22.1	0.868
Bulgaria	40.89	0.00	-0.003
Household's cash balance (EUR)			
Poland	-795.68	1,111.06	0.367
Romania	-1,573.24	333.50	0.109
Bulgaria	666.39	2,573.13	0.852
Economic farm size (EUR)			
Poland	3,289.31	82.46	0.032
Romania	3,206.85	0	0.001
Bulgaria	2,949.07	-257.78	-0.097
Cultivated agricultural area per household (ha)			
Poland	4.35	1.69	0.424
Romania	4.00	1.34	0.335
Bulgaria	0.50	-2.16	-0.551
Share of crop production in total agricultural production (per cent)			
Poland	50.35	19.87	0.726
Romania	53.82	23.34	0.852
Bulgaria	11.14	-19.34	-0.702
Number of agricultural products (number)			
Poland	9	-1	-0.185
Romania	10	0	-0.003
Bulgaria	18	8	1.461
Share of social security benefits in net household income (per cent)			
Poland	0.00	-18.9	-0.729
Romania	0.00	-18.90	-0.729
Bulgaria	11.97	-6.93	-0.269

Notes: ¹⁾ 0: no studies and cannot read or write, 1: no studies but can read and write, 2: elementary school, 3: vocational school, 4: secondary school, grammar school, 5: other occupation-specific higher education, 6: B.Sc., 7: M.Sc., 8: post graduate studies, 9: Ph.D. ²⁾ 1: none/only practical experience, 2: only short courses, 3: agricultural vocational school, 4: agricultural secondary school, 5: agricultural graduate studies, 6: post graduate studies.

Source: Own calculation with data from project survey.

■ Annex 5: Simulation Parameters

■ Table A 54: Gross income per unit of activity for simulated households in 2006

Household	Farming EUR/ha	Self-employment EUR/hour	Dependent employment EUR/hour
Rural diversifiers			
Poland	770	1.94	2.26
Romania	1,391	1.60	0.76
Bulgaria	771	2.25	0.59
Rural pensioners			
Poland	457	1.94	2.23
Romania	1,172	1.60	1.33
Bulgaria	2,141	2.25	1.03
Farmers			
Poland	787	1.94	1.13
Romania	852	1.60	1.33
Bulgaria	328	2.25	0.51
Rural newcomers			
Poland	655	1.94	1.41
Romania	802	1.60	0.92
Bulgaria	7,337	2.25	0.48

Source: Own calculation with data from project survey.

■ Table A 55: Labour input for farming for simulated households in 2006

Household	Farming hours/ha
Rural diversifiers	
Poland	436
Romania	1,530
Bulgaria	698
Rural pensioners	
Poland	200
Romania	1,668
Bulgaria	2,777
Farmers	
Poland	344
Romania	370
Bulgaria	93
Rural newcomers	
Poland	228
Romania	1,243
Bulgaria	7,708

Source: Own calculation with data from project survey.

Table A 56: Operational costs per unit of activity for simulated households in 2006

Household	Farming EUR/ha	Self-employment EUR/hour	Dependent employment EUR/hour
Rural diversifiers			
Poland	200	0.44	0.3
Romania	466	0.48	0.3
Bulgaria	153	0.71	0.0
Rural pensioners			
Poland	111	0.44	0.34
Romania	205	0.48	0.19
Bulgaria	544	0.71	0.17
Farmers			
Poland	318	0.44	0.14
Romania	424	0.48	0.20
Bulgaria	140	0.71	0.17
Rural newcomers			
Poland	263	0.44	0.14
Romania	342	0.48	0.00
Bulgaria	1,439	0.71	0.00

Source: Own calculation with data from project survey.

Table A 57: Land used for farming for simulated households in 2006

Household	land ha
Rural diversifiers	
Poland	4.19
Romania	2.20
Bulgaria	2.61
Rural pensioners	
Poland	8.20
Romania	2.64
Bulgaria	0.94
Farmers	
Poland	8.49
Romania	7.00
Bulgaria	15.45
Rural newcomers	
Poland	6.40
Romania	4.00
Bulgaria	0.50

Source: Own calculation with data from project survey.

Table A 58: Value of own-consumed agricultural production for simulated households in 2006

Household	Own consumption EUR
Rural diversifiers	
Poland	1,183.3
Romania	1,857.5
Bulgaria	1,839.8
Rural pensioners	
Poland	2,376.6
Romania	3,082.1
Bulgaria	1,374.4
Farmers	
Poland	2,460.7
Romania	4,569.6
Bulgaria	2,176.7
Rural newcomers	
Poland	1,401.8
Romania	2,019.9
Bulgaria	1,500.2

Source: Own calculation with data from project survey.

Table A 59: Non-earned income for simulated households in 2006

Household	Non-agricultural subsidies EUR	Pensions EUR	Social security benefits EUR	Remittances EUR	Other income EUR
Rural diversifiers					
Poland	0	0	0	0	0
Romania	0	0	0	0	0
Bulgaria	0	555	51	771	0
Rural pensioners					
Poland	0	1,854	0	0	0
Romania	0	1,225	0	0	0
Bulgaria	0	962	0	0	0
Farmers					
Poland	0	0	773	0	0
Romania	0	0	0	28	0
Bulgaria	0	1,233	0	0	0
Rural newcomers					
Poland	0	0	0	0	0
Romania	0	0	0	0	0
Bulgaria	0	0	349	0	0

Source: Own calculation with data from project survey.

Table A 60: Costs of one day of paid labour for simulated households in 2006

Country	Farming EUR/hour	Self-employment EUR/hour
Poland ¹⁾	2.56	2.56
Romania ²⁾	1.46	1.46
Bulgaria ³⁾	0.71	0.71

Note: 60% of the figures from national statistical yearbooks.

Source: Own calculation with data from: ¹⁾ Statistical Yearbook of the Republic of Poland (2007), ²⁾ Statistical Yearbook Romania (2007), and ³⁾ Statistical Yearbook Republic of Bulgaria (2006).

Table A 61: Household expenditure for simulated households in 2006

Household	Energy EUR	Food ¹⁾ EUR	Transport EUR	Farm investment EUR	Self-employment investment EUR	Education EUR	Support EUR	Other EUR
Rural diversifiers								
Poland	680	1,122 ²⁾	927	0	0	516	0	3,028
Romania	684	812 ³⁾	923	0	0	0	0	1,439
Bulgaria	833	748 ⁴⁾	0	0	0	0	0	1,906
Rural pensioners								
Poland	927	748 ²⁾	371	0	0	0	0	1,752
Romania	308	406 ³⁾	137	0	0	0	0	393
Bulgaria	389	499 ⁴⁾	123	0	0	0	0	1,112
Farmers								
Poland	1,143	1,496 ²⁾	0	0	0	331	0	1,912
Romania	513	203 ³⁾	0	0	0	0	0	390
Bulgaria	617	499 ⁴⁾	370	0	0	0	0	1,182
Rural newcomers								
Poland	389	374 ²⁾	1,082	0	0	0	0	1,181
Romania	683	812 ³⁾	854	0	0	400		725
Bulgaria	339	499 ⁴⁾	37	0	0	0	0	1,260

Note: 1) Expenditures on food: 60% of the per capita average (multiplied by household members) from the national statistical yearbooks

Source: Own calculation with data from project survey.

Expenditures on food: 2) Statistical Yearbook of the Republic of Poland (2007), 3) Statistical Yearbook Romania (2007), and 4) Statistical Yearbook Republic of Bulgaria (2006).

Table A 62: Rural diversifiers: Household time allocation, hours per year, 2006

No. of person	Sleeping, meals, etc.	Farming	Self-employment	Dependent employment	Education	Marketing	Child care	Household keeping	Leisure	Total for person
POLAND										
1	3,285	1,460	730	0	0	730	0	730	1,825	8,760
2	3,650	365	0	1,825	0	0	0	1,095	1,825	8,760
3	3,650	0	0	0	2,920	0	0	0	2,190	8,760
Total for activity	10,585	1,825	730	1,825	2,920	730	0	1,825	5,840	
ROMANIA										
1	3,862	2,590	0	0	0	259	0	0	2,049	8,760
2	3,862	518	0	0	0	1,036	0	1,036	2,308	8,760
3	3,862	0	0	2,072	0	0	0	0	2,826	8,760
4	3,862	259	0	2,072	0	0	0	259	2,308	8,760
Total for activity	15,448	3,367	0	4,144	0	1,295	0	1,295	9,491	0
BULGARIA										
1	3,111	507	0	2,093	254	127	254	507	1,906	8,760
2	2,842	816	0	2,072	0	188	377	502	1,963	8,760
3	2,577	497	0	0	0	62	249	0	5,375	8,760
Total for activity	8,530	1,821	0	4,165	254	377	879	1,010	9,244	0

Note: One annual work unit comprises 1,800 hours per year.

Source: Own simulation results with data from project survey.

Table A 63: Rural pensioners: Household time allocation, hours per year, 2006

No. of person	Sleeping, meals, etc.	Farming	Self-employment	Dependent employment	Education	Marketing	Child care	Household keeping	Leisure	Total for person
POLAND										
1	4,015	1,095	0	0	0	0	0	1,460	2,190	8,760
2	4,015	548	0	0	0	0	0	730	3,468	8,760
Total for activity	8,030	1,643	0	0	0	0	0	2,190	5,658	0
ROMANIA										
1	3,862	2,331	0	0	0	518	0	0	2,049	8,760
2	3,862	2,072	0	0	0	518	0	777	1,531	8,760
Total for activity	7,724	4,403	0	0	0	1,036	0	777	3,580	0
BULGARIA										
1	2,051	1,305	0	0	0	249	124	0	5,030	8,760
2	2,051	1,305	0	0	0	373	497	497	4,036	8,760
Total for activity	4,103	2,611	0	0	0	622	622	497	9,066	0

Note: One annual work unit comprises 1,800 hours per year.

Source: Own simulation results with data from project survey.

Table A 64: Farmers: Household time allocation, hours per year, 2006

No. of person	Sleeping, meals, etc.	Farming	Self-employment	Dependent employment	Education	Marketing	Child care	Household keeping	Leisure	Total for person
POLAND										
1	3,650	1,460	0	0	0	183	0	1,825	1,643	8,760
2	3,285	1,095	0	2,190	0	0	0	365	1,825	8,760
3	3,650	183	0	0	2,920	0	0	183	1,825	8,760
4	3,650	183	0	0	2,920	0	0	183	1,825	8,760
Total for activity	14,235	2,920	0	2,190	5,840	183	0	2,555	7,118	0
ROMANIA										
1	3,862	2,590	0	0	0	0	0	1,036	1,272	8,760
Total for activity	3,862	2,590	0	0	0	0	0	1,036	1,272	0
BULGARIA										
1	2,051	1,181	0	0	0	249	249	1,057	3,974	8,760
2	2,051	249	0	1,800	0	249	251	497	3,601	8,698
Total for activity	4,103	1,430	0	1,800	0	497	500	1,554	7,574	0

Note: One annual work unit comprises 1,800 hours per year.

Source: Own simulation results with data from project survey.

Table A 65: Rural newcomers: Household time allocation, hours per year, 2006

No. of person	Sleeping, meals, etc.	Farming	Self-employment	Dependent employment	Education	Marketing	Child care	Household keeping	Leisure	Total for person
POLAND										
1	3,285	1,460	0	548	183	183	0	730	2,373	8,760
Total for activity	3,285	1,460	0	548	183	183	0	730	2,373	0
ROMANIA										
1	3,137	2,176	0	2,176	0	0	0	0	1,272	8,760
2	3,137	2,486	0	0	0	0	0	1,865	1,272	8,760
3	3,758	311	0	0	3,419	0	0	0	1,272	8,760
4	3,758	0	0	0	3,419	0	0	0	1,583	8,760
Total for activity	13,790	4,972.8	0	2,175.6	6,838	0	0	1,865	5,399	0
BULGARIA										
1	3,849	1,803	0	2,051	0	62	0	497	497	8,760
2	4,347	2,051	0	0	0	62	0	0	2,300	8,760
Total for activity	8,196	3,854	0	2,051	0	124	0	497	2,797	0

Note: One annual work unit comprises 1,800 hours per year.

Source: Own simulation results with data from project survey.

Table A 66: Increase in gross income per unit of activity from 2006 to 2016

Scenario	Farming %			Self-employment %			Dependent employment %		
	PL	RO	BG	PL	RO	BG	PL	RO	BG
base	155	155	155	51	59	54	51	59	54
farm+tss	104	104	104	51	59	54	51	59	54
farm	104	104	104	51	59	54	51	59	54
self+tss	155	155	155	51	59	54	51	59	54
self	155	155	155	51	59	54	51	59	54
farm+self+tss	104	104	104	51	59	54	51	59	54
farm+self	104	104	104	51	59	54	51	59	54
retire	155	155	155	51	59	54	51	59	54

Note: PL: Poland, RO: Romania, BG: Bulgaria.

Source: Experts' assessments and FAPRI (2007) for the base figures for self- and dependent employment.

Table A 67: Increase in operational costs per unit of activity from 2006 to 2016

Scenario	Farming %			Self-employment %			Dependent employment %		
	PL	RO	BG	PL	RO	BG	PL	RO	BG
base	110	110	110	51	59	54	51	59	54
farm+tss	68	68	68	51	59	54	51	59	54
farm	68	68	68	51	59	54	51	59	54
self+tss	110	110	110	51	59	54	51	59	54
self	110	110	110	51	59	54	51	59	54
farm+self+tss	68	68	68	51	59	54	51	59	54
farm+self	68	68	68	51	59	54	51	59	54
retire	110	110	110	51	59	54	51	59	54

Note: PL: Poland, RO: Romania, BG: Bulgaria.

Source: Experts' assessments and FAPRI (2007) for the base figures for self- and dependent employment.

Table A 68: Share of investments covered by policy measures in 2016

Country	Farm development ¹⁾ %	Diversification ²⁾ %
Poland	50	50
Romania	50	70
Bulgaria	50	70

Notes: ¹⁾ Farm investment support for the modernisation of agricultural holdings. ²⁾ Support for diversification into non-agricultural activities.

Source: Expert assessments.

Table A 69: Household expenditures for investments in 2016

Scenario	Farming EUR			Self-employment EUR		
	PL	RO	BG	PL	RO	BG
base	0	0	0	0	0	0
farm+tss	1,319	1,319	1,319	0	0	0
farm	1,319	1,319	1,319	0	0	0
self+tss	0	0	0	1,319	791	791
self	0	0	0	1,319	791	791
farm+self+tss	1,319	1,319	1,319	1,319	791	791
farm+self	1,319	1,319	1,319	1,319	791	791
retire	0	0	0	0	0	0

Notes: PL: Poland, RO: Romania, BG: Bulgaria. Figures for expenditure on farming do not include the land rent for rented in land.

Source: Own calculation with data from project survey and experts' assessments.

Table A 70: Increase in household expenditures from 2006 to 2016

Country	Energy%	Food%	Transport%	Farm investment%	Self-employment investment%	Education%	Support%	Other%
Poland	80	51	80	0	0	80	51	51
Romania	80	59	80	0	0	80	59	59
Bulgaria	80	54	80	0	0	80	54	54

Note: 0% growth for investment expenditures, as interest rate already considered in total costs per year.

Source: Experts' assessments and FAPRI (2007).

Table A 71: Land rent in 2016

Country	Land rent EUR/ha
Poland	154.5
Romania	102.5
Bulgaria	102.8

Source: Own calculation with data from project survey and experts assessment.

Table A 72: Subsidies in 2016

Scenario	Farming ¹⁾ EUR/ha			Transitional semi-subsistence support ²⁾ EUR			Early retirement ³⁾ EUR		
	PL	RO	BG	PL	RO	BG	PL	RO	BG
base	211	178	216				0	0	0
farm+tss	211	178	216	x	x	x	0	0	0
farm	211	178	216				0	0	0
self+tss	211	178	216	x	x	x	0	0	0
self	211	178	216				0	0	0
farm+self+tss	211	178	216	x	x	x	0	0	0
farm+self	211	178	216				0	0	0
retire	0	0	0				4616	2,630	2,630

Notes: ¹⁾ Payments from the Single Area Payment Scheme. ²⁾ In the scenarios marked with "x" a return from the invested TSS payment of 100 EUR is assumed and added to the parameter "invest". ³⁾ Payments from early retirement measure.

PL: Poland, RO: Romania, BG: Bulgaria.

Source: Experts' assessments.

Table A 73: Weights for the four objective functions for simulated households

Household	Net agricultural production (max)	Net non-farm income (max)	Household's cash balance (max)	Agricultural labour use
Rural diversifiers				
Poland	0.09	0.55	0.27	0.09
Romania	0.22	0	0.33	0.44
Bulgaria	0.21	0.18	0.47	0.14
Rural pensioners				
Poland	0.26	0.17	0.31	0.26
Romania	0.22	0	0.39	0.39
Bulgaria	0.22	0.11	0.46	0.21
Farmers				
Poland	0.32	0.26	0.32	0.11
Romania	0.21	0.21	0.42	0.16
Bulgaria	0.33	0.08	0.47	0.12
Rural newcomers				
Poland	0.24	0.47	0.24	0.06
Romania	0.20	0.20	0.40	0.20
Bulgaria	0.28	0.13	0.46	0.12

Source: Own calculation with data from project survey.

Table A 74: Rural diversifiers: Minimum levels for activities

Scenario	Farming ha			Self-employment hours			Dependent employment hours		
	PL	RO	BG	PL	RO	BG	PL	RO	BG
base	0.00	1.10	1.31	0	0	0	547.50	1,243.20	1,249.54
farm+tss	4.19	2.20	2.61	0	0	0	547.50	1,243.20	1,249.54
farm	4.19	2.20	2.61	0	0	0	547.50	1,243.20	1,249.54
self+tss	4.19	2.2	2.61	900	1,800	1,800	547.50	1,243.20	1,249.54
self	0.00	1.10	1.31	900	1,800	1,800	547.50	1,243.20	1,249.54
farm+self+tss	4.19	2.20	2.61	900	1,800	1,800	547.50	1,243.20	1,249.54
farm+self	4.19	2.20	2.61	900	1,800	1,800	547.50	1,243.20	1,249.54
retire	0.00	0	0.00	0	0	0	0.00	0.00	0.00

Note: PL: Poland, RO: Romania, BG: Bulgaria.

Source: Own assumptions.

Table A 75: Rural pensioners: Minimum levels for activities

Scenario	Farming ha			Self-employment hours			Dependent employment hours		
	PL	RO	BG	PL	RO	BG	PL	RO	BG
base	0	1.32	0.47	0	0	0	0	0	0
farm+tss	8.2	2.64	0.94	0	0	0	0	0	0
farm	8.2	2.64	0.94	0	0	0	0	0	0
self+tss	8.2	2.64	0.94	1,448	1,800	1,800	0	0	0
self	0	1.32	0.47	1,448	1,800	1,800	0	0	0
farm+self+tss	8.2	2.64	0.94	1,448	1,800	1,800	0	0	0
farm+self	8.2	2.64	0.94	1,448	1,800	1,800	0	0	0
retire	0	0	0.00	0	0	0	0	0	0

Note: PL: Poland, RO: Romania, BG: Bulgaria

Source: Own assumptions.

Table A 76: Farmers: Minimum levels for activities

Scenario	Farming ha			Self-employment hours			Dependent employment hours		
	PL	RO	BG	PL	RO	BG	PL	RO	BG
base	4.25	3.50	7.73	0	0	0	657	0	0
farm+tss	8.49	7.00	15.45	0	0	0	657	0	0
farm	8.49	7.00	15.45	0	0	0	657	0	0
self+tss	8.49	7.00	15.45	1,800	1,800	1,800	657	0	0
self	4.25	3.50	7.725	1,800	1,800	1,800	657	0	0
farm+self+tss	8.49	7.00	15.45	1,800	1,800	1,800	657	0	0
farm+self	8.49	7.00	15.45	1,800	1,800	1,800	657	0	0
retire	0.00	0	0	0	0	0	0	0	0

Note: PL: Poland, RO: Romania, BG: Bulgaria

Source: Own assumptions.

Table A 77: Rural newcomers: Minimum levels for activities

Scenario	Farming ha			Self-employment hours			Dependent employment hours		
	PL	RO	BG	PL	RO	BG	PL	RO	BG
base	3.2	2.0	0.25	0	0	0	164.25	652.68	0
farm+tss	6.4	4.0	0.50	0	0	0	164.25	652.68	0
farm	6.4	4.0	0.50	0	0	0	164.25	652.68	0
self+tss	6.4	4.0	0.50	1,800	1,800	1,800	164.25	652.68	0
self	3.2	2.0	0.25	1,800	1,800	1,800	164.25	652.68	0
farm+self+tss	6.4	4.0	0.50	1,800	1,800	1,800	164.25	652.68	0
farm+self	6.4	4.0	0.50	1,800	1,800	1,800	164.25	652.68	0
retire	0.0	0.0	0.00	0	0	0	0	0	0

Note: PL: Poland, RO: Romania, BG: Bulgaria.

Source: Own assumptions.

Table A 78: Household labour capacities for income activities for simulated households in 2016

Household	Farming hours	Self-employment hours	Dependent employment hours
Rural diversifiers			
Poland	4,380	4,380	4,380
Romania	7,511	4,921	7,421
Bulgaria	5,986	5,489	5,000
Rural pensioners			
Poland	1,643	548	548
Romania	4,403	2,331	0
Bulgaria	2,611	2,611	2,611
Farmers			
Poland	5,110	2,190	4,745
Romania	2,590	2,590	2,500
Bulgaria	3,230	2,049	3,230
Rural newcomers			
Poland	2,008	2,008	2,008
Romania	7,148	2,176	2,500
Bulgaria	5,905	5,905	5,000

Note: One annual work unit comprises 1,800 hours per year.

Source: Own assumptions based on data from project survey.

Table A 79: Capacity (upper bound) for farming for simulated households in 2016

Household	base	farm+tss	farm	self+tss	self	farm+self+tss	farm+self	retire
Rural diversifiers								
Poland	4.19	8.38	8.38	4.19	4.19	8.38	8.38	0.00
Romania	2.20	4.40	4.40	2.20	2.20	4.40	4.40	0.00
Bulgaria	2.61	5.22	5.22	2.61	2.61	5.22	5.22	0.00
Rural pensioners								
Poland	8.20	16.40	16.40	8.20	8.20	16.40	16.40	0.00
Romania	2.64	5.28	5.28	2.64	2.64	5.28	5.28	0.00
Bulgaria	0.94	1.88	1.88	0.94	0.94	1.88	1.88	0.00
Farmers								
Poland	8.49	16.98	16.98	8.49	8.49	16.98	16.98	0.00
Romania	7.00	14.00	14.00	7.00	7.00	14.00	14.00	0.00
Bulgaria	15.45	30.90	30.90	15.45	15.45	30.90	30.90	0.00
Rural newcomers								
Poland	6.40	12.80	12.80	6.40	6.40	12.80	12.80	0.00
Romania	4.00	8.00	8.00	4.00	4.00	8.00	8.00	0.00
Bulgaria	0.50	1.00	1.00	0.50	0.50	1.00	1.00	0.00

Source: Own assumptions.

■ Annex 6: Second Round Questionnaire for the Simulation of SFHs

A. Labour

Please ask for the average distribution of time **per day** for the specified activities.

Note: Please ask for hours spent per day for the respective activity and calculate the percentage by dividing the stated hours by 24.

1. Labour distribution in 2006

No. of person according to project survey	Distribution of the total time for specified activities (%)									
	1.1 Sleep, meals, body care*	1.2 Agriculture Family farm	1.3 Non-farm self-employment	1.4 Agro tourism	1.5 Non-farm dependent job	1.6 Education	1.7 Marketing and processing family farm	1.8 Child care	1.9 Household keeping	1.10 Leisure
01										
02										
03										
04										
05										
06										
07										

* It should be at least 30%.

B. Land

3. Are you planning to rent in more land up to **2016**?

Yes (1) No (0) If **yes**, go to question 4.

4. How many hectares do you plan to rent in up to 2016? ha /____/

5. What is expected rent per ha? NC/ha /____/

Guidelines for informal experts' discussion of simulation parameters

As national experts please try to answer the following questions:

1. What do you think, what will be the gross income increase for farming up to 2016 in percent compared to 2006? Please consider that there was a rapid price growth in 2007 as compared to 2006? % /____/
2. How will the share of sold production in total production, i.e. the marketing rate, change to 2016? Please give a percentage change as compared to today for the selected households? % /____/

3. Please provide us with information about the planned or expected specification of policy measures and the amount of support in your country in 2016⁷¹.

- a. Farm investment measure NC /_____/
- b. Diversification measure NC /_____/
- c. Semi-subsistence support NC/year /_____/
- d. Early retirement measure NC/year /_____/
- e. Single Area Payment Scheme NC/ha /_____/

71 For measures of the second pillar the actual figures were used, when the measure was implemented in the country. If it was not yet implemented, national experts assessed the future level based on the available information about the planned implementation of the measure. For the SAPS, the full level of the payment after the phasing in of the measure was used in the model, based on the information of the national experts.

Annex 7: Simulation Results

Table A 80: Polish rural diversifiers: Activity levels and use of land and labour

	Use of land and labour ¹⁾						Sum own labour hours	Labour capacity hours
	Farming		Self-employment		Dependent employment			
	ha	Own labour ⁷² hours	Paid labour hours	Own labour hours	Paid labour hours	Own labour hours		
2006	4.19	1,825	0	730	0	1,825	4,380	4,380
Scenarios								
base								
2016	0.00	0	0	0	0	4,380	4,380	4,380
% ²⁾	-100	-100		-100	0	140		
farm+tss								
2016	4.19	560	900	0	0	3,820	4,380	4,380
% ³⁾				0	0	-13		
farm								
2016	4.19	560	900	0	0	3,820	4,380	4,380
% ³⁾				0	0	-13		
self+tss								
2016	4.19	925	900	900	900	2,555	4,380	4,380
% ³⁾						-42		
self								
2016	2.07	0	900	900	900	3,480	4,380	4,380
% ³⁾						-21		
farm+self+tss								
2016	4.19	560	900	900	900	2,920	4,380	4,380
% ³⁾						-33		
farm+self								
2016	4.19	560	900	900	900	2,920	4,380	4,380
% ³⁾						-33		
retire								
2016	0.00	0	0	0	0	4,380	4,380	4,380
% ³⁾	0	0	0	0	0	0		

Notes: ¹⁾ Unit for labour use is hours. One annual work unit comprises 1,800 hours per year. ²⁾ Change relative to 2006 in percent. ³⁾ Difference relative to baseline scenario 2016 in percent.

Source: Own simulation results with data from project survey.

72 The short term "own labour" is used in the tables synonymously to "individual household labour".

Table A 81: Polish rural diversifiers: Results for objective functions and net income

	Results for objective functions				Net income (EUR) per activity		
	Net agricultural production EUR	Net non-farm income EUR	Household cash balance EUR	Agricultural labour input hours	Farming ³⁾	Employment	
						Self	Dependent
2006	2,390	4,223	1,464	1,825	1,206	618	3,605
Scenarios							
base							
2016	0	13,069	1,597	0	-2,311	0	13,069
% ¹⁾	-100	209	9	-100	-292	-100	263
farm+tss							
2016	4,472	11,398	3,316	1,460	1,514	0	11,398
% ²⁾		-13	108		166	0	-13
farm							
2016	4,372	11,398	3,216	1,460	1,414	0	11,398
% ²⁾		-13	101		161	0	-13
self+tss							
2016	4,266	8,512	224	1,825	1,308	889	7,623
% ²⁾		-35	-86		157		-42
self							
2016	887	11,272	-516	900	-1,743	889	10,383
% ²⁾		-14	-132		25		-21
farm+self+tss							
2016	4,472	9,601	200	1,460	1,514	889	8,713
% ²⁾		-27	-87		166		-33
farm+self							
2016	4,372	9,601	100	1,460	1,414	889	8,713
% ²⁾		-27	-94		161		-33
retire							
2016	0	13,069	6,212	0	-2,311	0	13,069
% ²⁾	0	0	289	0	0	0	0

Notes: ¹⁾ Change relative to 2006 in percent. ²⁾ Difference relative to baseline scenario 2016 in percent.

³⁾ Net income farming = net_agr_prod – own_use – [level(farm)-own_land]*land_rent

Source: Own simulation results with data from project survey.

Table A 82: Romanian rural diversifiers: Activity levels and use of land and labour

	Use of land and labour ¹⁾							
	Farming		Self-employment		Dependent employment		Sum own labour hours	Labour capacity hours
	ha	Own labour hours	Paid labour hours	Own labour hours	Paid labour hours	Own labour hours		
2006	2.20	3,367	0	0	0	4,144	7,511	7,511
Scenarios								
base								
2016	2.20	3,360	0	0	0	4,151	7,511	7,511
% ²⁾	0	0	0	0	0	0		
farm+tss								
2016	4.39	4,477	900	0	0	3,034	7,511	7,511
% ³⁾	100	33	0	0	-27			
farm								
2016	4.39	4,477	900	0	0	3,034	7,511	7,511
% ³⁾	100	33	0	0	-27			
self+tss								
2016	2.20	2,467	900	3,801	900	1,243	7,511	7,511
% ³⁾	0	-27				-70		
self								
2016	1.46	1,341	900	4,921	900	1,249	7,511	7,511
% ³⁾	-33	-60				-70		
farm+self+tss								
2016	2.20	1,794	900	4,474	900	1,243	7,511	7,511
% ³⁾	0	-47				-70		
farm+self								
2016	2.20	1,794	900	4,474	900	1,243	7,511	7,511
% ³⁾	0	-47				-70		
retire								
2016	0.00	0	0	0	0	7,421	7,421	7,511
% ³⁾	-100	-100	0	0	0	79		

Notes: ¹⁾ Unit for labour use is hours. One annual work unit comprises 1,800 hours per year. ²⁾ Change relative to 2006 in percent.

³⁾ Difference relative to baseline scenario 2016 in percent.

Source: Own simulation results with data from project survey.

Table A 83: Romanian rural diversifiers: Results for objective functions and net income

	Results for objective functions				Net income (EUR) per activity		
	Net agricultural production EUR	Net non-farm income EUR	Household cash balance EUR	Agricultural labour input hours	Farming ³⁾	Employment	
						Self	Dependent
2006	2,035	2,036	-2,176	3,367	177	0	2,036
Scenarios							
base							
2016	5,638	3,253	-1,843	3,360	995	0	3,253
% ¹⁾	177	60	15	0	462	0	60
farm+tss							
2016	9,308	2,377	-203	5,377	4,439	0	2,377
% ²⁾	65	-27	89	60	346	0	-27
farm							
2016	9,208	2,377	-303	5,377	4,339	0	2,377
% ²⁾	63	-27	84	60	336	0	-27
self+tss							
2016	4,434	8,040	950	3,367	-209	7,066	974
% ²⁾	-21	147	152	0	-121		-70
self							
2016	2,445	10,042	907	2,241	-2,123	9,064	979
% ²⁾	-57	209	149	-33	-313		-70
farm+self+tss							
2016	4,804	9,241	1,201	2,694	161	8,267	974
% ²⁾	-15	184	165	-20	-84		-70
farm+self							
2016	4,704	9,241	1,101	2,694	61	8,267	974
% ²⁾	-17	184	160	-20	-94		-70
retire							
2016	0	5,815	-2,454	0	-4,418	0	5,815
% ²⁾	-100	79	-33	-100	-544	0	79

Notes: ¹⁾ Change relative to 2006 in percent. ²⁾ Difference relative to baseline scenario 2016 in percent.

³⁾ Net income farming = net_agr_prod – own_use – [level(farm)-own_land]*land_rent

Source: Own simulation results with data from project survey.

Table A 84: Bulgarian rural diversifiers: Activity levels and use of land and labour

	Use of land and labour ¹⁾							Sum own labour hours	Labour capacity hours
	Farming		Self-employment		Dependent employment				
	ha	Own labour hours	Paid labour hours	Own labour hours	Paid labour hours	Own labour hours			
2006	2.61	1,821	0	0	0	4,165	5,986	5,986	
Scenarios									
base									
2016	2.61	1,821	0	0	0	4,165	5,986	5,986	
% ²⁾	0	0	0	0	0	0			
farm+tss									
2016	5.22	2,014	900	0	0	3,973	5,986	5,986	
% ³⁾	100	11		0	0	-5			
farm									
2016	5.22	2,014	900	0	0	3,973	5,986	5,986	
% ³⁾	100	11		0	0	-5			
self+tss									
2016	2.61	921	900	3,816	900	1,250	5,986	5,986	
% ³⁾	0	-49				-70			
self									
2016	2.61	921	900	3,816	900	1,250	5,986	5,986	
% ³⁾	0	-49				-70			
farm+self+tss									
2016	5.22	2,013	900	2,723	900	1,250	5,986	5,986	
% ³⁾	100	11				-70			
farm+self									
2016	5.22	2,013	900	2,723	900	1,250	5,986	5,986	
% ³⁾	100	11				-70			
retire									
2016	0.00	0	0	0	0	5,000	5,000	5,986	
% ³⁾	-100	-100	0	0	0	20	-16		

Notes: ¹⁾ Unit for labour use is hours. One annual work unit comprises 1,800 hours per year. ²⁾ Change relative to 2006 in percent.

³⁾ Difference relative to baseline scenario 2016 in percent.

Source: Own simulation results with data from project survey.

Table A 85: Bulgarian rural diversifiers: Results for objective functions and net income

	Results for objective functions				Net income (EUR) per activity		
	Net agricultural production EUR	Net non-farm income EUR	Household cash balance EUR	Agricultural labour input hours	Farming ³⁾	Employment	
						Self	Dependent
2006	1,613	2,467	-109	1,821	-226	0	2,467
Scenarios							
base							
2016	4,293	3,790	587	1,821	-306	0	3,790
% ¹⁾	166	54	639	0	-35	0	54
farm+tss							
2016	7,830	3,615	2,925	2,914	2,962	0	3,615
% ²⁾	82	-5	398	60	1068	0	-5
farm							
2016	7,730	3,615	2,825	2,914	2,862	0	3,615
% ²⁾	80	-5	381	60	1035	0	-5
self+tss							
2016	3,754	11,669	7,135	1,821	-845	10,532	1,137
% ²⁾	-13	208	1115	0	-176		-70
self							
2016	3,653	11,669	7,035	1,821	-946	10,532	1,137
% ²⁾	-15	208	1098	0	-209		-70
farm+self+tss							
2016	7,830	9,081	7,599	2,913	2,962	7,944	1,137
% ²⁾	82	140	1194	60	1068		-70
farm+self							
2016	7,730	9,081	7,499	2,913	2,862	7,944	1,137
% ²⁾	80	140	1177	60	1035		-70
retire							
2016	0	4,550	-612		-4,331	0	4,550
% ²⁾	-100	20	-204	-100	-1315	0	20

Notes: ¹⁾ Change relative to 2006 in percent. ²⁾ Difference relative to baseline scenario 2016 in percent.

³⁾ Net income farming = net_agr_prod – own_use – [level(farm)-own_land]*land_rent

Source: Own simulation results with data from project survey.

Table A 86: Polish rural pensioners: Activity levels and use of land and labour

	Use of land and labour ¹⁾						Sum own labour hours	Labour capacity hours
	Farming		Self-employment		Dependent employment			
	ha	Own labour hours	Paid labour hours	Own labour hours	Paid labour hours	Own labour hours		
2006	8.2	1,643	0	0	0	0	1,643	1,643
Scenarios								
base								
2016	5.47	1,095	0	0	0	548	1,642	1,643
% ²⁾	-33	-33	0	0	0			
farm+tss								
2016	12.45	1,095	900	0	0	548	1,642	1,643
% ³⁾	128	0	0	0	0			
farm								
2016	12.45	1,095	900	0	0	548	1,642	1,643
% ³⁾	128	0	0	0	0			
self+tss								
2016	8.20	743	900	548	900	353	1,643	1,643
% ³⁾	50	-32				-36		
self								
2016	7.23	547	900	548	900	548	1,642	1,643
% ³⁾	32	-50				0		
farm+self+tss								
2016	10.33	755	900	548	900	340	1,643	1,643
% ³⁾	89	-31				-38		
farm+self								
2016	10.33	755	900	548	900	340	1,643	1,643
% ³⁾	89	-31				-38		
retire								
2016	0.00	0	0	0	0	548	548	1,643
% ³⁾	-100	-100	0	0	0	0		

Notes: ¹⁾ Unit for labour use is hours. One annual work unit comprises 1,800 hours per year. ²⁾ Change relative to 2006 in percent. ³⁾ Difference relative to baseline scenario 2016 in percent.

Source: Own simulation results with data from project survey.

Table A 87: Polish rural pensioners: Results for objective functions and net income

	Results for objective functions				Net income (EUR) per activity		
	Net agricultural production EUR	Net non-farm income EUR	Household cash balance EUR	Agricultural labour input hours	Farming ³⁾	Employment	
						Self	Dependent
2006	2,830	0	-951	1,643	453	0	0
Scenarios							
base							
2016	5,084	1,562	-1,032	1,095	-435	0	1,562
% ¹⁾	80		-8	-33	-196	0	
farm+tss							
2016	8,560	1,562	1,519	1,995	1,961	0	1,562
% ²⁾	68	0	247	82	551	0	0
farm							
2016	8,460	1,562	1,419	1,995	1,861	0	1,562
% ²⁾	66	0	238	82	528	0	0
self+tss							
2016	5,423	1,985	-1,434	1,643	-519	980	1,005
% ²⁾	7	27	-39	50	-19		-36
self							
2016	4,417	2,542	-1,938	1,447	-1,374	980	1,562
% ²⁾	-13	63	-88	32	-216		0
farm+self+tss							
2016	6,979	1,951	-1,111	1,655	709	980	971
% ²⁾	37	25	-8	51	263		-38
farm+self							
2016	6,879	1,951	-1,211	1,655	609	980	971
% ²⁾	35	25	-17	51	240		-38
retire							
2016	0	1,562	-1,809	0	-4,675	0	1,562
% ²⁾	-100	0	-75	-100	-975	0	0

Notes: ¹⁾ Change relative to 2006 in percent. ²⁾ Difference relative to baseline scenario 2016 in percent.

³⁾ Net income farming = net_agr_prod – own_use – [level(farm)-own_land]*land_rent

Source: Own simulation results with data from project survey.

Table A 88: Romanian rural pensioners: Activity levels and use of land and labour

	Use of land and labour ¹⁾						Sum own labour hours	Labour capacity hours
	Farming		Self-employment		Dependent employment			
	ha	Own labour hours	Paid labour hours	Own labour hours	Paid labour hours	Own labour hours		
2006	2.64	4,403	0	0	0	0	4,403	4,403
Scenarios								
base								
2016	2.64	4,401	0	0	0	0	4,401	4,403
% ²⁾	0	0	0	0	0	0		
farm+tss								
2016	3.97	4,401	900	0	0	0	4,401	4,403
% ³⁾	51	0	0	0	0	0		
farm								
2016	3.97	4,401	900	0	0	0	4,401	4,403
% ³⁾	51	0	0	0	0	0		
self+tss								
2016	2.64	3,503	900	900	900	0	4,403	4,403
% ³⁾	0	-20				0		
self								
2016	1.78	2,072	900	2,331	900	0	4,403	4,403
% ³⁾	-32	-53				0		
farm+self+tss								
2016	2.64	2,622	900	1,781	900	0	4,403	4,403
% ³⁾	0	-40				0		
farm+self								
2016	2.64	2,622	900	1,781	900	0	4,403	4,403
% ³⁾	0	-40				0		
retire								
2016	0.00	0	0	0	0	0	0	4,403
% ³⁾	-100	-100	0	0	0	0		

Notes: ¹⁾ Unit for labour use is hours. One annual work unit comprises 1,800 hours per year. ²⁾ Change relative to 2006 in percent. ³⁾ Difference relative to baseline scenario 2016 in percent.

Source: Own simulation results with data from project survey.

Table A 89: Romanian rural pensioners: Results for objective functions and net income

	Results for objective functions				Net income (EUR) per activity		
	Net agricultural production EUR	Net non-farm income EUR	Household cash balance EUR	Agricultural labour input hours	Employment		
					Farming ³⁾	Self	Dependent
2006	2,554	0	961	4,403	-582	0	0
Scenarios							
base							
2016	6,753	0	-605	4,401	-952	0	0
% ¹⁾	164	0	-163	0	-64	0	0
farm+tss							
2016	8,418	0	-158	5,301	576	0	0
% ²⁾	25	0	74	20	161	0	0
farm							
2016	8,318	0	-258	5,301	476	0	0
% ²⁾	23	0	57	20	150	0	0
self+tss							
2016	5,540	1,894	-716	4,403	-2,166	1,894	0
% ²⁾	-18		-18	0	-127		0
self							
2016	3,244	4,445	-524	2,972	-4,373	4,445	0
% ²⁾	-52		13	-32	-359		0
farm+self+tss							
2016	5,689	3,464	-316	3,522	-2,017	3,464	0
% ²⁾	-16		48	-20	-112		0
farm+self							
2016	5,589	3,464	-416	3,522	-2,117	3,464	0
% ²⁾	-17		31	-20	-122		0
retire							
2016	0	0	-4,925	0	-7,434	0	0
% ²⁾	-100	0	-714	-100	-681	0	0

Notes: ¹⁾ Change relative to 2006 in percent. ²⁾ Difference relative to baseline scenario 2016 in percent.

³⁾ Net income farming = net_agr_prod – own_use – [level(farm)-own_land]*land_rent

Source: Own simulation results with data from project survey.

Table A 90: Bulgarian rural pensioners: Activity levels and use of land and labour

	Use of land and labour ¹⁾							Sum own labour hours	Labour capacity hours
	Farming		Self-employment		Dependent employment				
	ha	Own labour hours	Paid labour hours	Own labour hours	Paid labour hours	Own labour hours			
2006	0.94	2,611	0	0	0	0	2,611	2,611	
Scenarios									
base									
2016	0.94	2,611	0	0	0	0	2,611	2,611	
% ²⁾	0	0	0	0	0	0			
farm+tss									
2016	1.27	1,918	900	0	0	693	2,611	2,611	
% ³⁾	35	-27		0	0				
farm									
2016	1.27	1,918	900	0	0	693	2,611	2,611	
% ³⁾	35	-27		0	0				
self+tss									
2016	0.94	1,711	900	900	900	0	2,611	2,611	
% ³⁾	0	-34				0			
self									
2016	0.47	405	900	2,205	900	0	2,611	2,611	
% ³⁾	-50	-84				0			
farm+self+tss									
2016	0.94	1,189	900	1,422	900	0	2,611	2,611	
% ³⁾	0	-54				0			
farm+self									
2016	0.94	1,189	900	1,422	900	0	2,611	2,611	
% ³⁾	0	-54				0			
retire									
2016	0.00	0	0	0	0	2,611	2,611	2,611	
% ³⁾	-100	-100	0	0	0	0			

Notes: ¹⁾ Unit for labour use is hours. One annual work unit comprises 1,800 hours per year. ²⁾ Change relative to 2006 in percent.

³⁾ Difference relative to baseline scenario 2016 in percent.

Source: Own simulation results with data from project survey.

Table A 91: Bulgarian rural pensioners: Results for objective functions and net income

	Results for objective functions				Net income (EUR) per activity		
	Net agricultural production EUR	Net non-farm income EUR	Household cash balance EUR	Agricultural labour input hours	Farming ³⁾	Employment	
						Self	Dependent
2006	1,501	0	-803	2,611	127	0	0
Scenarios							
base							
2016	4,058	0	-1,093	2,611	622	0	0
% ¹⁾	170	0	-36	0	390	0	0
farm+tss							
2016	5,341	912	-180	2,818	1,871	0	912
% ²⁾	32		84	8	201	0	
farm							
2016	5,241	912	-280	2,818	1,771	0	912
% ²⁾	29		74	8	185	0	
self+tss							
2016	3,519	3,625	1,201	2,611	83	3,625	0
% ²⁾	-13		210	0	-87		0
self							
2016	1,390	6,717	2,111	1,305	-1,998	6,717	0
% ²⁾	-66		293	-50	-421		0
farm+self+tss							
2016	4,207	4,862	1,807	2,089	771	4,862	0
% ²⁾	4		265	-20	24		0
farm+self							
2016	4,107	4,862	1,707	2,089	671	4,862	0
% ²⁾	1		256	-20	8		0
retire							
2016	0	3,436	808	0	-3,339	0	3,436
% ²⁾	-100		174	-100	-637	0	

Notes: ¹⁾ Change relative to 2006 in percent. ²⁾ Difference relative to baseline scenario 2016 in percent.

³⁾ Net income farming = net_agr_prod – own_use – [level(farm)-own_land]*land_rent

Source: Own simulation results with data from project survey.

Table A 92: Polish farmers: Activity levels and use of land and labour

	Use of land and labour ¹⁾							Sum own labour hours	Labour capacity hours
	Farming		Self-employment		Dependent employment				
	ha	Own labour hours	Paid labour hours	Own labour hours	Paid labour hours				
2006	8.49	2,920	0	0	0	2,190	5,110	5,110	
Scenarios									
base									
2016	8.49	2,920	0	0	0	2,190	5,110	5,110	
% ²⁾	0	0	0	0	0	0			
farm+tss									
2016	16.98	3,771	900	0	0	1,339	5,110	5,110	
% ³⁾	100	29		0	0	-39			
farm									
2016	16.98	3,771	900	0	0	1,339	5,110	5,110	
% ³⁾	100	29		0	0	-39			
self+tss									
2016	8.49	2,020	900	2190	900	900	5,110	5,110	
% ³⁾	0	-31				-59			
self									
2016	8.49	2,020	900	2190	900	900	5,110	5,110	
% ³⁾	0	-31				-59			
farm+self+tss									
2016	16.18	3,552	900	901	900	657	5,110	5,110	
% ³⁾	91	22				-70			
farm+self									
2016	16.18	3,552	900	901	900	657	5,110	5,110	
% ³⁾	91	22				-70			
retire									
2016	0.00	0	0	0	0	4,745	4,745	5,110	
% ³⁾	-100	-100	0	0	0	117	-7		

Notes: ¹⁾ Unit for labour use is hours. One annual work unit comprises 1,800 hours per year. ²⁾ Change relative to 2006 in percent.

³⁾ Difference relative to baseline scenario 2016 in percent.

Source: Own simulation results with data from project survey.

Table A 93: Polish farmers: Results for objective functions and net income

	Results for objective functions				Net income (EUR) per activity		
	Net agricultural production EUR	Net non-farm income EUR	Household cash balance EUR	Agricultural labour input hours	Employment		
					Farming ³⁾	Self	Dependent
2006	3,979	2,163	-64	2,920	1,518	0	2,163
Scenarios							
base							
2016	11,362	3,268	4,231	2,920	5,210	0	3,268
% ¹⁾	186	51	6,710	0	243	0	51
farm+tss							
2016	17,474	1,997	8,233	4,671	10,011	0	1,997
% ²⁾	54	-39	95	60	92	0	-39
farm							
2016	17,374	1,997	8,133	4,671	9,911	0	1,997
% ²⁾	53	-39	92	60	90	0	-39
self+tss							
2016	9,159	6,049	3,490	2,920	3,007	4,707	1,343
% ²⁾	-19	85	-18	0	-42		-59
self							
2016	9,058	6,050	3,390	2,920	2,906	4,707	1,343
% ²⁾	-20	85	-20	0	-44		-59
farm+self+tss							
2016	16,622	2,761	6,781	4,452	9,281	1,781	980
% ²⁾	46	-15	60	52	78		-70
farm+self							
2016	16,522	2,761	6,681	4,452	9,181	1,781	980
% ²⁾	45	-15	58	52	76		-70
retire							
2016	0	7,079	816	0	-4,840	0	7,079
% ²⁾	-100	117	-81	-100	-193	0	117

Notes: ¹⁾ Change relative to 2006 in percent. ²⁾ Difference relative to baseline scenario 2016 in percent.

³⁾ Net income farming = net_agr_prod – own_use – [level(farm)-own_land]*land_rent

Source: Own simulation results with data from project survey.

Table A 94: Romanian farmers: Activity levels and use of land and labour

	Use of land and labour ¹⁾							Sum own labour hours	Labour capacity hours
	Farming		Self-employment			Dependent employment			
	ha	Own labour hours	Paid labour hours	Own labour hours	Paid labour hours	Own labour hours			
2006	7.00	2,590	0	0	0	0	2,590	2,590	
Scenarios									
base									
2016	7.00	2,590	0	0	0	0	2,590	2,590	
% ²⁾	0	0	0	0	0	0			
farm+tss									
2016	11.79	2,590	900	0	0	0	2,590	2,590	
% ³⁾	68	0		0	0	0			
farm									
2016	11.79	2,590	900	0	0	0	2,590	2,590	
% ³⁾	68	0		0	0	0			
self+tss									
2016	7.00	1,690	900	900	900	0	2,590	2,590	
% ³⁾	0	-35				0			
self									
2016	7.00	1,690	900	900	900	0	2,590	2,590	
% ³⁾	0	-35				0			
farm+self+tss									
2016	8.75	1,690	900	900	900	0	2,590	2,590	
% ³⁾	25	-35				0			
farm+self									
2016	8.75	1,690	900	900	900	0	2,590	2,590	
% ³⁾	25	-35				0			
retire									
2016	0.00	0	0	0	0	2,500	2,500	2,590	
% ³⁾	-100	-100	0	0	0				

Notes: ¹⁾ Unit for labour use is hours. One annual work unit comprises 1,800 hours per year. ²⁾ Change relative to 2006 in percent.

³⁾ Difference relative to baseline scenario 2016 in percent.

Source: Own simulation results with data from project survey.

Table A 95: Romanian farmers: Results for objective functions and net income

	Results for objective functions				Net income (EUR) per activity		
	Net agricultural production EUR	Net non-farm income EUR	Household cash balance EUR	Agricultural labour input hours	Employment		
					Farming ³⁾	Self	Dependent
2006	2,998	0	-908	2,590	-1,572	0	0
Scenarios							
base							
2016	8,979	0	-3,025	2,590	-2,445	0	0
% ¹⁾	200	0	-233	0	-56	0	0
farm+tss							
2016	12,383	0	-580	3,490	468	0	0
% ²⁾	38	0	81	35	119	0	0
farm							
2016	12,283	0	-680	3,490	368	0	0
% ²⁾	37	0	78	35	115	0	0
self+tss							
2016	7,763	1,894	-3,139	2,590	-3,661	1,894	0
% ²⁾	-14		-4	0	-50		0
self							
2016	7,663	1,894	-3,239	2,590	-3,761	1,894	0
% ²⁾	-15		-7	0	-54		0
farm+self+tss							
2016	9,263	1,894	-2,826	2,590	-2,341	1,894	0
% ²⁾	3		7	0	4		0
farm+self							
2016	9,163	1,894	-2,926	2,590	-2,441	1,894	0
% ²⁾	2		3	0	0		0
retire							
2016	0	4,542	-5,357	0	-10,706	0	4,542
% ²⁾	-100		-77	-100	-338	0	

Notes: ¹⁾ Change relative to 2006 in percent. ²⁾ Difference relative to baseline scenario 2016 in percent.

³⁾ Net income farming = net_agr_prod – own_use – [level(farm)-own_land]*land_rent

Source: Own simulation results with data from project survey.

Table A 96: Bulgarian farmers: Activity levels and use of land and labour

	Use of land and labour ¹⁾							Sum own labour hours	Labour capacity hours
	Farming		Self-employment		Dependent employment				
	ha	Own labour hours	Paid labour hours	Own labour hours	Paid labour hours	Own labour hours			
2006	15.45	1,430	0	0	0	1,800	3,230	3,230	
Scenarios									
base									
2016	15.45	1,430	0	0	0	1,800	3,230	3,230	
% ²⁾	-1	0	0	0	0	0			
farm+tss									
2016	30.90	1,387	900	0	0	1,842	3,230	3,230	
% ³⁾	100	-3		0	0	2			
farm									
2016	30.90	1,387	900	0	0	1,842	3,230	3,230	
% ³⁾	100	-3		0	0	2			
self+tss									
2016	15.45	530	900	2,049	900	651	3,230	3,230	
% ³⁾	0	-63				-64			
self									
2016	15.45	530	900	2,049	900	651	3,230	3,230	
% ³⁾	0	-63				-64			
farm+self+tss									
2016	30.90	1,387	900	1,842	900	0	3,230	3,230	
% ³⁾	100	-3				-100			
farm+self									
2016	30.90	1,387	900	1,842	900	0	3,230	3,230	
% ³⁾	100	-3				-100			
retire									
2016	0.00	0	0	0	0	3,230	3,230	3,230	
% ³⁾	-100	-100	0	0	0	79			

Notes: ¹⁾ Unit for labour use is hours. One annual work unit comprises 1,800 hours per year. ²⁾ Change relative to 2006 in percent.

³⁾ Difference relative to baseline scenario 2016 in percent.

Source: Own simulation results with data from project survey.

Table A 97: Bulgarian farmers: Results for objective functions and net income

	Results for objective functions				Net income (EUR) per activity		
	Net agricultural production EUR	Net non-farm income EUR	Household cash balance EUR	Agricultural labour input hours	Employment		
					Farming ³⁾	Self	Dependent
2006	2,897	617	409	1,430	720	0	617
Scenarios							
base							
2016	8,360	948	4,739	1,430	2,918	0	948
% ¹⁾	189	54	1059	0	305	0	54
farm+tss							
2016	14,336	970	11,169	2,287	7,307	0	970
% ²⁾	71	2	136	60	150	0	2
farm							
2016	14,236	970	11,069	2,287	7,207	0	970
% ²⁾	70	2	134	60	147	0	2
self+tss							
2016	7,821	6,689	9,150	1,430	2,379	6,346	343
% ²⁾	-6	606	93	0	-18		-64
self							
2016	7,721	6,689	9,050	1,430	2,279	6,346	343
% ²⁾	-8	606	91	0	-22		-64
farm+self+tss							
2016	14,336	5,857	15,264	2,287	7,307	5,857	0
% ²⁾	71	518	222	60	150		-100
farm+self							
2016	14,236	5,857	15,164	2,287	7,207	5,857	0
% ²⁾	70	518	220	60	147		-100
retire							
2016	0	1,700	-1,987	0	-3,854	0	1,700
% ²⁾	-100	79	-142	-100	-232	0	79

Notes: ¹⁾ Change relative to 2006 in percent. ²⁾ Difference relative to baseline scenario 2016 in percent.

³⁾ Net income farming = net_agr_prod – own_use – [level(farm)-own_land]*land_rent

Source: Own simulation results with data from project survey.

Table A 98: Polish rural newcomers: Activity levels and use of land and labour

	Use of land and labour ¹⁾						Sum own labour hours	Labour capacity hours
	Farming		Self-employment		Dependent employment			
	ha	Own labour hours	Paid labour hours	Own labour hours	Paid labour hours	Own labour hours		
2006	6.4	1,460	0	0	0	548	2,008	2,008
Scenarios								
base								
2016	4.59	1,047	0	0	0	960	2,008	2,008
% ²⁾	-28	-28	0	0	0	75		
farm+tss								
2016	8.98	739	900	0	0	1,268	2,008	2,008
% ³⁾	96	-29		0	0	32		
farm								
2016	8.98	739	900	0	0	1,268	2,008	2,008
% ³⁾	96	-29		0	0	32		
self+tss								
2016	6.40	560	900	1,283	900	164	2,008	2,008
% ³⁾	39	-47				-83		
self								
2016	5.07	257	900	1,586	900	164	2,008	2,008
% ³⁾	10	-75				-83		
farm+self+tss								
2016	6.40	269	900	1,574	900	164	2,008	2,008
% ³⁾	39	-74				-83		
farm+self								
2016	6.40	269	900	1,574	900	164	2,008	2,008
% ³⁾	39	-74				-83		
retire								
2016	0.00	0	0	0	0	2,008	2,008	2,008
% ³⁾	-100	-100	0	0	0	109		

Notes: ¹⁾ Unit for labour use is hours. One annual work unit comprises 1,800 hours per year. ²⁾ Change relative to 2006 in percent.

³⁾ Difference relative to baseline scenario 2016 in percent.

Source: Own simulation results with data from project survey.

Table A 99: Polish rural newcomers: Results for objective functions and net income

	Results for objective functions				Net income (EUR) per activity		
	Net agricultural production EUR	Net non-farm income EUR	Household cash balance EUR	Agricultural labour input hours	Employment		
					Farming ³⁾	Self	Dependent
2006	2,509	695	-796	1,460	1,107	0	695
Scenarios							
base							
2016	5,133	1,842	-279	1,047	1,908	0	1,842
% ¹⁾	105	165	65	-28	72	0	165
farm+tss							
2016	7,329	2,433	1,438	1,639	3,426	0	2,433
% ²⁾	43	32	615	57	80	0	32
farm							
2016	7,229	2,433	1,338	1,639	3,326	0	2,433
% ²⁾	41	32	580	57	74	0	32
self+tss							
2016	4,951	2,964	-555	1,460	1,446	2,649	315
% ²⁾	-4	61	-99	39	-24		-83
self							
2016	3,367	3,651	-1,527	1,157	67	3,336	315
% ²⁾	-34	98	-448	10	-96		-83
farm+self+tss							
2016	5,024	3,625	-1,140	1,169	1,519	3,310	315
% ²⁾	-2	97	-309	12	-20		-83
farm+self							
2016	4,924	3,625	-1,240	1,169	1,419	3,310	315
% ²⁾	-4	97	-345	12	-26		-83
retire							
2016	0	3,851	954	0	-2,516	0	3,851
% ²⁾	-100	109	442	-100	-232	0	109

Notes: ¹⁾ Change relative to 2006 in percent. ²⁾ Difference relative to baseline scenario 2016 in percent.

³⁾ Net income farming = net_agr_prod – own_use – [level(farm)-own_land]*land_rent

Source: Own simulation results with data from project survey.

Table A 100: Romanian rural newcomers: Activity levels and use of land and labour

	Use of land and labour ¹⁾						Sum own labour hours	Labour capacity hours
	Farming		Self-employment		Dependent employment			
	ha	Own labour hours	Paid labour hours	Own labour hours	Paid labour hours	Own labour hours		
2006	4.00	4,972	0	0	0	2,176	7,148	7,148
Scenarios								
base								
2016	3.74	4,648	0	0	0	2,500	7,148	7,148
% ²⁾	-7	-7	0	0	0	15		
farm+tss								
2016	5.58	4,648	900	0	0	2,500	7,148	7,148
% ³⁾	49	0	0	0	0	0		
farm								
2016	5.58	4,648	900	0	0	2,500	7,148	7,148
% ³⁾	49	0	0	0	0	0		
self+tss								
2016	4.00	4,073	900	2,176	900	900	7,148	7,148
% ³⁾	7	-12				-64		
self								
2016	2.71	2,473	900	2,176	900	2,500	7,148	7,148
% ³⁾	-27	-47				0		
farm+self+tss								
2016	4.00	3,078	900	2,176	900	1,894	7,148	7,148
% ³⁾	7	-34				-24		
farm+self								
2016	4.00	3,078	900	2,176	900	1,894	7,148	7,148
% ³⁾	7	-34				-24		
retire								
2016	0.00	0	0	0	0	2,500	2,500	7,148
% ³⁾	-100	-100	0	0	0	0		

Notes: ¹⁾ Unit for labour use is hours. One annual work unit comprises 1,800 hours per year. ²⁾ Change relative to 2006 in percent.

³⁾ Difference relative to baseline scenario 2016 in percent.

Source: Own simulation results with data from project survey.

Table A 101: Romanian rural newcomers: Results for objective functions and net income

	Results for objective functions				Net income (EUR) per activity		
	Net agricultural production EUR	Net non-farm income EUR	Household cash balance EUR	Agricultural labour input hours	Employment		
					Farming ³⁾	Self	Dependent
2006	2,864	1,994	-1,573	4,972	844	0	1,994
Scenarios							
base							
2016	4,955	3,653	-1,689	4,648	-68	0	3,653
% ¹⁾	73	83	-7	-7	-108	0	83
farm+tss							
2016	6,198	3,653	-1,627	5,548	987	0	3,653
% ²⁾	25	0	4	19	1552	0	0
farm							
2016	6,098	3,653	-1,727	5,548	887	0	3,653
% ²⁾	23	0	-2	19	1405	0	0
self+tss							
2016	4,085	5,483	-1,502	4,973	-965	4,168	1,315
% ²⁾	-18	50	11	7	-1320		-64
self							
2016	2,279	7,821	-1,066	3,373	-2,639	4,168	3,653
% ²⁾	-54	114	37	-27	-3783		0
farm+self+tss							
2016	4,525	6,936	-927	3,978	-525	4,168	2,768
% ²⁾	-9	90	45	-14	-673		-24
farm+self							
2016	4,425	6,936	-1,027	3,978	-625	4,168	2,768
% ²⁾	-11	90	39	-14	-820		-24
retire							
2016	0	3,653	-4,295	0	-4,640	0	3,653
% ²⁾	-100	0	-154	-100	-6728	0	0

Notes: ¹⁾ Change relative to 2006 in percent. ²⁾ Difference relative to baseline scenario 2016 in percent.

³⁾ Net income farming = net_agr_prod – own_use – [level(farm)-own_land]*land_rent

Source: Own simulation results with data from project survey.

Table A 102: Bulgarian rural newcomers: Activity levels and use of land and labour

	Use of land and labour ¹⁾							Sum own labour hours	Labour capacity hours
	Farming		Self-employment		Dependent employment				
	ha	Own labour hours	Paid labour hours	Own labour hours	Paid labour hours	Own labour hours			
2006	0.50	3,854	0	0	0	2,051	5,905	5,905	
Scenarios									
base									
2016	0.50	3,854	0	0	0	2,051	5,905	5,905	
% ²⁾	0	0	0	0	0	0			
farm+tss									
2016	1.00	5,266	900	0	0	639	5,905	5,905	
% ³⁾	100	37		0	0	-69			
farm									
2016	1.00	5,266	900	0	0	639	5,905	5,905	
% ³⁾	100	37		0	0	-69			
self+tss									
2016	0.50	2,954	900	2,951	900	0	5,905	5,905	
% ³⁾	0	-23				-100			
self									
2016	0.42	2,371	900	3,535	900	0	5,905	5,905	
% ³⁾	-15	-38				-100			
farm+self+tss									
2016	0.50	2,184	900	3,721	900	0	5,905	5,905	
% ³⁾	0	-43				-100			
farm+self									
2016	0.50	2,184	900	3,721	900	0	5,905	5,905	
% ³⁾	0	-43				-100			
retire									
2016	0.00	0	0	0	0	5,000	5,000	5,905	
% ³⁾	-100	-100	0	0	0	144	-15		

Notes: ¹⁾ Unit for labour use is hours. One annual work unit comprises 1,800 hours per year. ²⁾ Change relative to 2006 in percent.

³⁾ Difference relative to baseline scenario 2016 in percent.

Source: Own simulation results with data from project survey.

Table A 103: Bulgarian rural newcomers: Results for objective functions and net income

	Results for objective functions				Net income (EUR) per activity		
	Net agricultural production EUR	Net non-farm income EUR	Household cash balance EUR	Agricultural labour input hours	Employment		
					Farming ³⁾	Self	Dependent
2006	2,949	987	666	3,854	1,449	0	987
Scenarios							
base							
2016	7,844	1,516	2,875	3,854	4,093	0	1,516
% ¹⁾	166	54	332	0	183	0	54
farm+tss							
2016	13,511	472	6,235	6,166	9,709	0	472
% ²⁾	72	-69	117	60	137	0	-69
farm							
2016	13,411	472	6,135	6,166	9,609	0	472
% ²⁾	71	-69	113	60	135	0	-69
self+tss							
2016	7,304	8,484	8,512	3,854	3,554	8,484	0
% ²⁾	-7	460	196	0	-13		-100
self							
2016	6,017	9,866	8,598	3,271	2,275	9,866	0
% ²⁾	-23	551	199	-15	-44		-100
farm+self+tss							
2016	7,237	10,308	8,950	3,084	3,487	10,308	0
% ²⁾	-8	580	211	-20	-15		-100
farm+self							
2016	7,137	10,308	8,850	3,084	3,387	10,308	0
% ²⁾	-9	580	208	-20	-17		-100
retire							
2016	0	3,696	-217	0	-3,699	0	3,696
% ²⁾	-100	144	-108	-100	-190	0	144

Notes: ¹⁾ Change relative to 2006 in percent. ²⁾ Difference relative to baseline scenario 2016 in percent.

³⁾ Net income farming = net_agr_prod – own_use – [level(farm)-own_land]*land_rent

Source: Own simulation results with data from project survey.

Table A 104: Sensitivity analysis for Polish rural newcomers: Activity levels and use of land and labour for 15% increase of costs per unit farming

Scenarios	Use of land and labour ¹⁾						Sum own labour hours	Labour capacity hours
	Farming		Self-employment		Dependent employment			
	ha	Own labour hours	Paid labour hours	Own labour hours	Paid labour hours	Own labour hours		
base								
Scenario 2016	4.59	1,047	0	0	0	960	2,008	0
Sensitivity 2016	4.59	1,047	0	0	0	960	2,008	0
% ²⁾	0	0	0	0	0	0	0	0
farm+tss								
Scenario 2016	8.98	739	900	0	0	1,268	2,008	0
Sensitivity 2016	8.98	739	900	0	0	1,268	2,008	0
%	0	0	0	0	0	0	0	0
farm								
Scenario 2016	8.98	739	900	0	0	1,268	2,008	0
Sensitivity 2016	8.98	739	900	0	0	1,268	2,008	0
%	0	0	0	0	0	0	0	0
self+tss								
Scenario 2016	6.40	560	900	1,283	900	164	2,008	0
Sensitivity 2016	6.40	560	900	1,283	900	164	2,008	0
%	0	0	0	0	0	0	0	0
self								
Scenario 2016	5.07	257	900	1,586	900	164	2,008	0
Sensitivity 2016	5.07	257	900	1,586	900	164	2,008	0
%	0	0	0	0	0	0	0	0
farm+self+tss								
Scenario 2016	6.40	269	900	1,574	900	164	2,008	0
Sensitivity 2016	6.40	269	900	1,574	900	164	2,008	0
%	0	0	0	0	0	0	0	0
farm+self								
Scenario 2016	6.40	269	900	1,574	900	164	2,008	0
Sensitivity 2016	6.40	269	900	1,574	900	164	2,008	0
%	0	0	0	0	0	0	0	0
retire								
Scenario 2016	0.00	0	0	0	0	2,008	2,008	0
Sensitivity 2016	0.00	0	0	0	0	2,008	2,008	0
%	0	0	0	0	0	0	0	0

Notes: ¹⁾ Unit for labour use is hours. One annual work unit comprises 1,800 hours per year. ²⁾ Deviation of the value assuming higher farming costs (sensitivity 2016) from the result for the scenario analysis (scenario 2016) in percent.

Source: Own simulation results with data from project survey.

Table A 105: Sensitivity analysis for Polish rural newcomers: Results for objective functions and net income for 15% increase of costs per unit farming

Scenarios	Results for objective functions				Net income (EUR) per activity		
	Net agricultural production EUR	Net non-farm income EUR	Household cash balance EUR	Agricultural labour input hours	Employment		
					Farming	Self	Dependent
base							
Scenario 2016	5,133	1,842	-279	1,047	1,908	0	1,842
Sensitivity 2016	4,952	1,842	-460	1,047	1,727	0	1,842
% ¹⁾	-4	0	-65	0	-9	0	0
farm+tss							
Scenario 2016	7,329	2,433	1,438	1,639	3,426	0	2,433
Sensitivity 2016	7,046	2,433	1,154	1,639	3,142	0	2,433
% ¹⁾	-4	0	-20	0	-8	0	0
farm							
Scenario 2016	7,229	2,433	1,338	1,639	3,326	0	2,433
Sensitivity 2016	6,946	2,433	1,054	1,639	3,042	0	2,433
% ¹⁾	-4	0	-21	0	-9	0	0
self+tss							
Scenario 2016	4,951	2,964	-555	1,460	1,446	2,649	315
Sensitivity 2016	4,698	2,964	-807	1,460	1,194	2,649	315
% ¹⁾	-5	0	-45	0	-17	0	0
self							
Scenario 2016	3,367	3,651	-1,527	1,157	67	3,336	315
Sensitivity 2016	3,167	3,651	-1,727	1,157	-133	3,336	315
% ¹⁾	-6	0	-13	0	-298	0	0
farm+self+tss							
Scenario 2016	5,024	3,625	-1,140	1,169	1,519	3,310	315
Sensitivity 2016	4,822	3,625	-1,342	1,169	1,317	3,310	315
% ¹⁾	-4	0	-18	0	-13	0	0
farm+self							
Scenario 2016	4,924	3,625	-1,240	1,169	1,419	3,310	315
Sensitivity 2016	4,722	3,625	-1,442	1,169	1,217	3,310	315
% ¹⁾	-4	0	-16	0	-14	0	0
retire							
Scenario 2016	0	3,851	954	0	-2,516	0	3,851
Sensitivity 2016	0	3,851	954	0	-2,516	0	3,851
% ¹⁾	0	0	0	0	0	0	0

Notes: ¹⁾ Deviation of the value assuming 15% higher farming costs (sensitivity 2016) from the result for the scenario analysis (scenario 2016) in percent.

Source: Own simulation results with data from project survey.

Table A 106: Sensitivity analysis for Polish rural newcomers: Activity levels and use of land and labour for 30% increase of costs per unit farming

Scenarios	Use of land and labour ¹⁾							
	Farming			Self-employment		Dependent employment	Sum own labour hours	Labour capacity hours
	ha	Own labour hours	Paid labour hours	Own labour hours	Paid labour hours	Own labour hours		
base								
Scenario 2016	4.59	1,047	0	0	0	960	2,008	0
Sensitivity 2016	4.59	1,047	0	0	0	960	2,008	0
% ²⁾	0	0	0	0	0	0	0	0
farm+tss								
Scenario 2016	8.98	739	900	0	0	1,268	2,008	0
Sensitivity 2016	8.98	739	900	0	0	1,268	2,008	0
%	0	0	0	0	0	0	0	0
farm								
Scenario 2016	8.98	739	900	0	0	1,268	2,008	0
Sensitivity 2016	8.98	739	900	0	0	1,268	2,008	0
%	0	0	0	0	0	0	0	0
self+tss								
Scenario 2016	6.40	560	900	1,283	900	164	2,008	0
Sensitivity 2016	6.40	560	900	1,283	900	164	2,008	0
%	0	0	0	0	0	0	0	0
self								
Scenario 2016	5.07	257	900	1,586	900	164	2,008	0
Sensitivity 2016	5.07	256	900	1,587	900	164	2,008	0
%	0	0	0	0	0	0	0	0
farm+self+tss								
Scenario 2016	6.40	269	900	1,574	900	164	2,008	0
Sensitivity 2016	6.40	269	900	1,574	900	164	2,008	0
%	0	0	0	0	0	0	0	0
farm+self								
Scenario 2016	6.40	269	900	1,574	900	164	2,008	0
Sensitivity 2016	6.40	269	900	1,574	900	164	2,008	0
%	0	0	0	0	0	0	0	0
retire								
Scenario 2016	0.00	0	0	0	0	2,008	2,008	0
Sensitivity 2016	0.00	0	0	0	0	2,008	2,008	0
%	0	0	0	0	0	0	0	0

Notes: ¹⁾ Unit for labour use is hours. One annual work unit comprises 1,800 hours per year. ²⁾ Deviation of the value assuming 30% higher farming costs (sensitivity 2016) from the result for the scenario analysis (scenario 2016) in percent.

Source: Own simulation results with data from project survey.

Table A 107: Sensitivity analysis for Polish rural newcomers: Results for objective functions and net income for 30% increase of costs per unit farming

Scenarios	Results for objective functions				Net income (EUR) per activity		
	Net agricultural production EUR	Net non-farm income EUR	Household cash balance EUR	Agricultural labour input hours	Employment		
					Farming	Self	Dependent
base							
Scenario 2016	5,133	1,842	-279	1,047	1,908	0	1,842
Sensitivity 2016	4,771	1,842	-641	1,047	1,546	0	1,842
% ¹⁾	-7	0	-130	0	-19	0	0
farm+tss							
Scenario 2016	7,329	2,433	1,438	1,639	3,426	0	2,433
Sensitivity 2016	6,763	2,433	871	1,639	2,859	0	2,433
% ¹⁾	-8	0	-39	0	-17	0	0
farm							
Scenario 2016	7,229	2,433	1,338	1,639	3,326	0	2,433
Sensitivity 2016	6,663	2,433	771	1,639	2,759	0	2,433
% ¹⁾	-8	0	-42	0	-17	0	0
self+tss							
Scenario 2016	4,951	2,964	-555	1,460	1,446	2,649	315
Sensitivity 2016	4,446	2,964	-1,060	1,460	942	2,649	315
% ¹⁾	-10	0	-91	0	-35	0	0
self							
Scenario 2016	3,367	3,651	-1,527	1,157	67	3,336	315
Sensitivity 2016	2,963	3,653	-1,929	1,156	-336	3,338	315
% ¹⁾	-12	0	-26	0	-600	0	0
farm+self+tss							
Scenario 2016	5,024	3,625	-1,140	1,169	1,519	3,310	315
Sensitivity 2016	4,620	3,625	-1,544	1,169	1,115	3,310	315
% ¹⁾	-8	0	-35	0	-27	0	0
farm+self							
Scenario 2016	4,924	3,625	-1,240	1,169	1,419	3,310	315
Sensitivity 2016	4,520	3,625	-1,644	1,169	1,015	3,310	315
% ¹⁾	-8	0	-33	0	-28	0	0
retire							
Scenario 2016	0	3,851	954	0	-2,516	0	3,851
Sensitivity 2016	0	3,851	954	0	-2,516	0	3,851
% ¹⁾	0	0	0	0	0	0	0

Notes: ¹⁾ Deviation of the value assuming 30% higher farming costs (sensitivity 2016) from the result for the scenario analysis (scenario 2016) in percent.

Source: Own simulation results with data from project survey.

Table A 108: Sensitivity analysis for Polish rural newcomers: Activity levels and use of land and labour for 10% increase of costs per unit self-employment

Scenarios	Use of land and labour ¹⁾							Sum own labour hours	Labour capacity hours
	Farming		Self-employment		Dependent employment				
	ha	Own labour hours	Paid labour hours	Own labour hours	Paid labour hours	Own labour hours			
base									
Scenario 2016	4.59	1,047	0	0	0	960	2,008	0	
Sensitivity 2016	4.59	1,047	0	0	0	960	2,008	0	
% ²⁾	0	0	0	0	0	0	0	0	
farm+tss									
Scenario 2016	8.98	739	900	0	0	1,268	2,008	0	
Sensitivity 2016	8.98	739	900	0	0	1,268	2,008	0	
%	0	0	0	0	0	0	0	0	
farm									
Scenario 2016	8.98	739	900	0	0	1,268	2,008	0	
Sensitivity 2016	8.98	739	900	0	0	1,268	2,008	0	
%	0	0	0	0	0	0	0	0	
self+tss									
Scenario 2016	6.40	560	900	1,283	900	164	2,008	0	
Sensitivity 2016	6.40	560	900	1,283	900	164	2,008	0	
%	0	0	0	0	0	0	0	0	
self									
Scenario 2016	5.07	257	900	1,586	900	164	2,008	0	
Sensitivity 2016	5.07	257	900	1,586	900	164	2,008	0	
%	0	0	0	0	0	0	0	0	
farm+self+tss									
Scenario 2016	6.40	269	900	1,574	900	164	2,008	0	
Sensitivity 2016	6.40	269	900	1,574	900	164	2,008	0	
%	0	0	0	0	0	0	0	0	
farm+self									
Scenario 2016	6.40	269	900	1,574	900	164	2,008	0	
Sensitivity 2016	6.40	269	900	1,574	900	164	2,008	0	
%	0	0	0	0	0	0	0	0	
retire									
Scenario 2016	0.00	0	0	0	0	2,008	2,008	0	
Sensitivity 2016	0.00	0	0	0	0	2,008	2,008	0	
%	0	0	0	0	0	0	0	0	

Notes: ¹⁾ Unit for labour use is hours. One annual work unit comprises 1,800 hours per year. ²⁾ Deviation of the value from the sensitivity analysis (sensitivity 2016) to the result for the scenario analysis (scenario 2016) in percent.

Source: Own simulation results with data from project survey.

Table A 109: Sensitivity analysis for Polish rural newcomers: Results for objective functions and net income for 10% increase of costs per unit self-employment

Scenarios	Results for objective functions				Net income (EUR) per activity		
	Net agricultural production EUR	Net non-farm income EUR	Household cash balance EUR	Agricultural labour input hours	Employment		
					Farming	Self	Dependent
base							
Scenario 2016	5,133	1,842	-279	1,047	1,908	0	1,842
Sensitivity 2016	5,133	1,842	-279	1,047	1,908	0	1,842
% ¹⁾	0	0	0	0	0	0	0
farm+tss							
Scenario 2016	7,329	2,433	1,438	1,639	3,426	0	2,433
Sensitivity 2016	7,329	2,433	1,438	1,639	3,426	0	2,433
% ¹⁾	0	0	0	0	0	0	0
farm							
Scenario 2016	7,229	2,433	1,338	1,639	3,326	0	2,433
Sensitivity 2016	7,229	2,433	1,338	1,639	3,326	0	2,433
% ¹⁾	0	0	0	0	0	0	0
self+tss							
Scenario 2016	4,951	2,964	-555	1,460	1,446	2,649	315
Sensitivity 2016	4,951	2,878	-641	1,460	1,446	2,563	315
% ¹⁾	0	-3	-15	0	0	-3	0
self							
Scenario 2016	3,367	3,651	-1,527	1,157	67	3,336	315
Sensitivity 2016	3,367	3,554	-1,625	1,157	67	3,239	315
% ¹⁾	0	-3	-6	0	0	-3	0
farm+self+tss							
Scenario 2016	5,024	3,625	-1,140	1,169	1,519	3,310	315
Sensitivity 2016	5,024	3,527	-1,237	1,169	1,519	3,212	315
% ¹⁾	0	-3	-9	0	0	-3	0
farm+self							
Scenario 2016	4,924	3,625	-1,240	1,169	1,419	3,310	315
Sensitivity 2016	4,924	3,527	-1,337	1,169	1,419	3,212	315
% ¹⁾	0	-3	-8	0	0	-3	0
retire							
Scenario 2016	0	3,851	954	0	-2,516	0	3,851
Sensitivity 2016	0	3,851	954	0	-2,516	0	3,851
% ¹⁾	0	0	0	0	0	0	0

Notes: ¹⁾ Deviation of the value from the sensitivity analysis (sensitivity 2016) to the result for the scenario analysis (scenario 2016) in percent.

Source: Own simulation results with data from project survey.

Table A 110: Sensitivity analysis for Polish rural newcomers: Activity levels and use of land and labour for 10% decrease of costs per unit self-employment

Scenarios	Use of land and labour ¹⁾						Sum own labour hours	Labour capacity hours
	Farming		Self-employment		Dependent employment			
	ha	Own labour hours	Paid labour hours	Own labour hours	Paid labour hours	Own labour hours		
base								
Scenario 2016	4.59	1,047	0	0	0	960	2,008	0
Sensitivity 2016	4.59	1,047	0	0	0	960	2,008	0
% ²⁾	0	0	0	0	0	0	0	0
farm+tss								
Scenario 2016	8.98	739	900	0	0	1,268	2,008	0
Sensitivity 2016	8.98	739	900	0	0	1,268	2,008	0
%	0	0	0	0	0	0	0	0
farm								
Scenario 2016	8.98	739	900	0	0	1,268	2,008	0
Sensitivity 2016	8.98	739	900	0	0	1,268	2,008	0
%	0	0	0	0	0	0	0	0
self+tss								
Scenario 2016	6.40	560	900	1,283	900	164	2,008	0
Sensitivity 2016	6.40	560	900	1,283	900	164	2,008	0
%	0	0	0	0	0	0	0	0
self								
Scenario 2016	5.07	257	900	1,586	900	164	2,008	0
Sensitivity 2016	5.07	257	900	1,586	900	164	2,008	0
%	0	0	0	0	0	0	0	0
farm+self+tss								
Scenario 2016	6.40	269	900	1,574	900	164	2,008	0
Sensitivity 2016	6.40	269	900	1,574	900	164	2,008	0
%	0	0	0	0	0	0	0	0
farm+self								
Scenario 2016	6.40	269	900	1,574	900	164	2,008	0
Sensitivity 2016	6.40	269	900	1,574	900	164	2,008	0
%	0	0	0	0	0	0	0	0
retire								
Scenario 2016	0.00	0	0	0	0	2,008	2,008	0
Sensitivity 2016	0.00	0	0	0	0	2,008	2,008	0
%	0	0	0	0	0	0	0	0

Notes: ¹⁾ Unit for labour use is hours. One annual work unit comprises 1,800 hours per year. ²⁾ Deviation of the value from the sensitivity analysis (sensitivity 2016) to the result for the scenario analysis (scenario 2016) in percent.

Source: Own simulation results with data from project survey.

Table A 111: Sensitivity analysis for Polish rural newcomers: Results for objective functions and net income for 10% decrease of costs per unit self-employment

Scenarios	Results for objective functions				Net income (EUR) per activity		
	Net agricultural production EUR	Net non-farm income EUR	Household cash balance EUR	Agricultural labour input hours	Employment		
					Farming	Self	Dependent
base							
Scenario 2016	5,133	1,842	-279	1,047	1,908	0	1,842
Sensitivity 2016	5,133	1,842	-279	1,047	1,908	0	1,842
% ¹⁾	0	0	0	0	0	0	0
farm+tss							
Scenario 2016	7,329	2,433	1,438	1,639	3,426	0	2,433
Sensitivity 2016	7,329	2,433	1,438	1,639	3,426	0	2,433
% ¹⁾	0	0	0	0	0	0	0
farm							
Scenario 2016	7,229	2,433	1,338	1,639	3,326	0	2,433
Sensitivity 2016	7,229	2,433	1,338	1,639	3,326	0	2,433
% ¹⁾	0	0	0	0	0	0	0
self+tss							
Scenario 2016	4,951	2,964	-555	1,460	1,446	2,649	315
Sensitivity 2016	4,951	3,070	-449	1,460	1,446	2,755	315
% ¹⁾	0	4	19	0	0	4	0
self							
Scenario 2016	3,367	3,651	-1,527	1,157	67	3,336	315
Sensitivity 2016	3,367	3,772	-1,406	1,157	67	3,457	315
% ¹⁾	0	3	8	0	0	4	0
farm+self+tss							
Scenario 2016	5,024	3,625	-1,140	1,169	1,519	3,310	315
Sensitivity 2016	5,024	3,745	-1,020	1,169	1,519	3,430	315
% ¹⁾	0	3	11	0	0	4	0
farm+self							
Scenario 2016	4,924	3,625	-1,240	1,169	1,419	3,310	315
Sensitivity 2016	4,924	3,745	-1,120	1,169	1,419	3,430	315
% ¹⁾	0	3	10	0	0	4	0
retire							
Scenario 2016	0	3,851	954	0	-2,516	0	3,851
Sensitivity 2016	0	3,851	954	0	-2,516	0	3,851
% ¹⁾	0	0	0	0	0	0	0

Notes: ¹⁾ Deviation of the value from the sensitivity analysis (sensitivity 2016) to the result for the scenario analysis (scenario 2016) in percent.

Source: Own simulation results with data from project survey.

Table A 112: Sensitivity analysis for Polish rural newcomers: Activity levels and use of land and labour for 10% increase of costs per unit dependent employment

Scenarios	Use of land and labour ¹⁾							Sum own labour hours	Labour capacity hours
	Farming			Self-employment		Dependent employment			
	ha	Own labour hours	Paid labour hours	Own labour hours	Paid labour hours	Own labour hours			
base									
Scenario 2016	4.59	1,047	0	0	0	960	2,008	0	
Sensitivity 2016	4.59	1,047	0	0	0	960	2,008	0	
% ²⁾	0	0	0	0	0	0	0	0	
farm+tss									
Scenario 2016	8.98	739	900	0	0	1,268	2,008	0	
Sensitivity 2016	8.98	739	900	0	0	1,268	2,008	0	
%	0	0	0	0	0	0	0	0	
farm									
Scenario 2016	8.98	739	900	0	0	1,268	2,008	0	
Sensitivity 2016	8.98	739	900	0	0	1,268	2,008	0	
%	0	0	0	0	0	0	0	0	
self+tss									
Scenario 2016	6.40	560	900	1,283	900	164	2,008	0	
Sensitivity 2016	6.40	560	900	1,283	900	164	2,008	0	
%	0	0	0	0	0	0	0	0	
self									
Scenario 2016	5.07	257	900	1,586	900	164	2,008	0	
Sensitivity 2016	5.07	257	900	1,586	900	164	2,008	0	
%	0	0	0	0	0	0	0	0	
farm+self+tss									
Scenario 2016	6.40	269	900	1,574	900	164	2,008	0	
Sensitivity 2016	6.40	269	900	1,574	900	164	2,008	0	
%	0	0	0	0	0	0	0	0	
farm+self									
Scenario 2016	6.40	269	900	1,574	900	164	2,008	0	
Sensitivity 2016	6.40	269	900	1,574	900	164	2,008	0	
%	0	0	0	0	0	0	0	0	
retire									
Scenario 2016	0.00	0	0	0	0	2,008	2,008	0	
Sensitivity 2016	0.00	0	0	0	0	2,008	2,008	0	
%	0	0	0	0	0	0	0	0	

Notes: ¹⁾ Unit for labour use is hours. One annual work unit comprises 1,800 hours per year. ²⁾ Deviation of the value from the sensitivity analysis (sensitivity 2016) to the result for the scenario analysis (scenario 2016) in percent.

Source: Own simulation results with data from project survey.

Table A 113: Sensitivity analysis for Polish rural newcomers: Results for objective functions and net income for 10% increase of costs per unit dependent employment

Scenarios	Results for objective functions				Net income (EUR) per activity		
	Net agricultural production EUR	Net non-farm income EUR	Household cash balance EUR	Agricultural labour input hours	Employment		
					Farming ¹⁾	Self	Dependent
base							
Scenario 2016	5,133	1,842	-279	1,047	1,908	0	1,842
Sensitivity 2016	5,133	1,829	-291	1,047	1,908	0	1,829
% ¹⁾	0	-1	-4	0	0	0	-1
farm+tss							
Scenario 2016	7,329	2,433	1,438	1,639	3,426	0	2,433
Sensitivity 2016	7,329	2,417	1,422	1,639	3,426	0	2,417
% ¹⁾	0	-1	-1	0	0	0	-1
farm							
Scenario 2016	7,229	2,433	1,338	1,639	3,326	0	2,433
Sensitivity 2016	7,229	2,417	1,322	1,639	3,326	0	2,417
% ¹⁾	0	-1	-1	0	0	0	-1
self+tss							
Scenario 2016	4,951	2,964	-555	1,460	1,446	2,649	315
Sensitivity 2016	4,951	2,962	-557	1,460	1,446	2,649	313
% ¹⁾	0	0	0	0	0	0	-1
self							
Scenario 2016	3,367	3,651	-1,527	1,157	67	3,336	315
Sensitivity 2016	3,367	3,649	-1,529	1,157	67	3,336	313
% ¹⁾	0	0	0	0	0	0	-1
farm+self+tss							
Scenario 2016	5,024	3,625	-1,140	1,169	1,519	3,310	315
Sensitivity 2016	5,024	3,623	-1,142	1,169	1,519	3,310	313
% ¹⁾	0	0	0	0	0	0	-1
farm+self							
Scenario 2016	4,924	3,625	-1,240	1,169	1,419	3,310	315
Sensitivity 2016	4,924	3,623	-1,242	1,169	1,419	3,310	313
% ¹⁾	0	0	0	0	0	0	-1
retire							
Scenario 2016	0	3,851	954	0	-2,516	0	3,851
Sensitivity 2016	0	3,825	928	0	-2,516	0	3,825
% ¹⁾	0	-1	-3	0	0	0	-1

Notes: ¹⁾ Deviation of the value from the sensitivity analysis (sensitivity 2016) to the result for the scenario analysis (scenario 2016) in percent.

Source: Own simulation results with data from project survey.

Table A 114: Sensitivity analysis for Polish rural newcomers: Activity levels and use of land and labour for 10% decrease of costs per unit dependent employment

Scenarios	Use of land and labour ¹⁾							Sum own labour hours	Labour capacity hours
	Farming		Self-employment		Dependent employment				
	ha	Own labour hours	Paid labour hours	Own labour hours	Paid labour hours	Own labour hours			
base									
Scenario 2016	4.59	1,047	0	0	0	960	2,008	0	
Sensitivity 2016	4.59	1,047	0	0	0	960	2,008	0	
% ²⁾	0	0	0	0	0	0	0	0	
farm+tss									
Scenario 2016	8.98	739	900	0	0	1,268	2,008	0	
Sensitivity 2016	8.98	739	900	0	0	1,268	2,008	0	
%	0	0	0	0	0	0	0	0	
farm									
Scenario 2016	8.98	739	900	0	0	1,268	2,008	0	
Sensitivity 2016	8.98	739	900	0	0	1,268	2,008	0	
%	0	0	0	0	0	0	0	0	
self+tss									
Scenario 2016	6.40	560	900	1,283	900	164	2,008	0	
Sensitivity 2016	6.40	560	900	1,283	900	164	2,008	0	
%	0	0	0	0	0	0	0	0	
self									
Scenario 2016	5.07	257	900	1,586	900	164	2,008	0	
Sensitivity 2016	5.07	257	900	1,586	900	164	2,008	0	
%	0	0	0	0	0	0	0	0	
farm+self+tss									
Scenario 2016	6.40	269	900	1,574	900	164	2,008	0	
Sensitivity 2016	6.40	269	900	1,574	900	164	2,008	0	
%	0	0	0	0	0	0	0	0	
farm+self									
Scenario 2016	6.40	269	900	1,574	900	164	2,008	0	
Sensitivity 2016	6.40	269	900	1,574	900	164	2,008	0	
%	0	0	0	0	0	0	0	0	
retire									
Scenario 2016	0.00	0	0	0	0	2,008	2,008	0	
Sensitivity 2016	0.00	0	0	0	0	2,008	2,008	0	
%	0	0	0	0	0	0	0	0	

Notes: ¹⁾ Unit for labour use is hours. One annual work unit comprises 1,800 hours per year. ²⁾ Deviation of the value from the sensitivity analysis (sensitivity 2016) to the result for the scenario analysis (scenario 2016) in percent.

Source: Own simulation results with data from project survey.

Table A 115: Sensitivity analysis for Polish rural newcomers: Results for objective functions and net income for 10% decrease of costs per unit dependent employment

Scenarios	Results for objective functions				Net income (EUR) per activity		
	Net agricultural production EUR	Net non-farm income EUR	Household cash balance EUR	Agricultural labour input hours	Employment		
					Farming	Self	Dependent
base							
Scenario 2016	5,133	1,842	-279	1,047	1,908	0	1,842
Sensitivity 2016	5,133	1,857	-264	1,047	1,908	0	1,857
% ¹⁾	0	1	5	0	0	0	1
farm+tss							
Scenario 2016	7,329	2,433	1,438	1,639	3,426	0	2,433
Sensitivity 2016	7,329	2,452	1,457	1,639	3,426	0	2,452
% ¹⁾	0	1	1	0	0	0	1
farm							
Scenario 2016	7,229	2,433	1,338	1,639	3,326	0	2,433
Sensitivity 2016	7,229	2,452	1,357	1,639	3,326	0	2,452
% ¹⁾	0	1	1	0	0	0	1
self+tss							
Scenario 2016	4,951	2,964	-555	1,460	1,446	2,649	315
Sensitivity 2016	4,951	2,967	-553	1,460	1,446	2,649	318
% ¹⁾	0	0	0	0	0	0	1
self							
Scenario 2016	3,367	3,651	-1,527	1,157	67	3,336	315
Sensitivity 2016	3,367	3,654	-1,525	1,157	67	3,336	318
% ¹⁾	0	0	0	0	0	0	1
farm+self+tss							
Scenario 2016	5,024	3,625	-1,140	1,169	1,519	3,310	315
Sensitivity 2016	5,024	3,627	-1,137	1,169	1,519	3,310	318
% ¹⁾	0	0	0	0	0	0	1
farm+self							
Scenario 2016	4,924	3,625	-1,240	1,169	1,419	3,310	315
Sensitivity 2016	4,924	3,627	-1,237	1,169	1,419	3,310	318
% ¹⁾	0	0	0	0	0	0	1
retire							
Scenario 2016	0	3,851	954	0	-2,516	0	3,851
Sensitivity 2016	0	3,882	985	0	-2,516	0	3,882
% ¹⁾	0	1	3	0	0	0	1

Notes: ¹⁾ Deviation of the value from the sensitivity analysis (sensitivity 2016) to the result for the scenario analysis (scenario 2016) in percent.

Source: Own simulation results with data from project survey.

■ Annex 8: Structured Questionnaire of S-FARM

Semi-Subsistence Farm Household Questionnaire for S-FARM Project

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Version: 20th July 2007

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This interview focuses on **semi-subsistent** farm households. According to the answer to the following question the interview can be performed or has to be finished.

Do you sell at least a part of your agricultural production? Yes (1) No (0)

If the answer is **yes**, please **perform** the interview. Otherwise go to the next household.

	Name	Code/Number	Date:
Country/County		/...../2007
Main respondent			
Street address			
Location			
Telephone			
Interviewer			

Note: The **household** is defined as all people living in a dwelling and being part of the same economic entity, who have lived together for more than 9 months during 2006 or have regularly provided the household with remittances during 2006.

The **village** refers to the smallest administrative unit not to the municipality.

All figures refer to the **year 2006**.

Remember to **list all household members living outside the country for employment reasons**.

NC stands for national currency and has to be replaced in the national questionnaires by PLN (Polish Złoty) in Poland, ROL (Romanian New Lei) in Romania, or BGN (Bulgarian Lev) in Bulgaria.

I received 10*/15** Euro for participating in the interview.

Signature of main respondent

* in Romania and Bulgaria, ** in Poland

Section 1: HOUSEHOLD DEMOGRAPHY

Code 1.2

Head.....	(1)	Grandchildren.....	(8)	Cousin.....	(15)
Wife/husband.....	(2)	Grandparents.....	(9)	Other relative.....	(91)
Son/daughter.....	(3)	Father-in-law/mother in law.....	(10)	Children from another family.....	(92)
Father/mother.....	(4)	Son in law/daughter in law.....	(11)	Other non-relative.....	(93)
Sister/brother.....	(5)	Sister in law/brother in law.....	(12)	Renter.....	(94)
Step son/step daughter.....	(6)	Nephew/niece.....	(13)		
Step father/step mother.....	(7)	Uncle/aunt.....	(14)		

Code 1.5

Employed in permanent full-time job.....	(1)	Registered as unemployed.....	(7)	Pensioner and no longer working.....	(12)
Employed in permanent part-time job.....	(2)	Unemployed but not registered.....	(8)	Pupil/student/apprentice.....	(13)
Employed in temporary job.....	(3)	Registered as disabled.....	(9)	Housewife.....	(14)
Self-employed in non-farm family business.....	(4)	Disabled but still working.....	(10)	On maternity leave.....	(15)
Responsible for the family farm.....	(5)	Pensioner but still working.....	(11)	Other:.....	(99)
Helping on the farm.....	(6)				

Code 1.6

No studies and cannot read or write.....	(0)	Vocational school.....	(3)	B.Sc. (college, university).....	(6)
No studies but can read or write.....	(1)	Secondary school, gymnasium.....	(4)	M.Sc. studies (university).....	(7)
Elementary school.....	(2)	Other occupation-specific higher education.....	(5)	Post graduate studies.....	(8)
				Ph.D. studies (university).....	(9)

Code 1.7

None/only practical experience.....	(1)	Agricultural secondary school.....	(4)
Only short courses.....	(2)	Agricultural graduate studies (college, university).....	(5)
Agricultural vocational school.....	(3)	Post graduate studies.....	(6)

Section 2: HOUSEHOLD'S EQUIPMENT AND ACCESS TO INFRASTRUCTURE

2.1 Does your household dispose of "..."? Please circle the answer.

- | | | |
|--|---------|--------|
| a) Refrigerator..... | Yes (1) | No (0) |
| b) Telephone..... | Yes (1) | No (0) |
| c) Mobile phone..... | Yes (1) | No (0) |
| d) Computer..... | Yes (1) | No (0) |
| e) Internet..... | Yes (1) | No (0) |
| f) Car..... | Yes (1) | No (0) |
| g) Connection to public fresh water supply system..... | Yes (1) | No (0) |
| h) Connection to public sewage system..... | Yes (1) | No (0) |

2.2 How many rooms* has your residential house? Number / ___ /

* This refers to rooms for living like sitting room, bedroom, and children's rooms. Please do not include bathroom and kitchen.

2.3 How far from the farm house is the nearest "..."? (Use increments of 0.5 km)

Item name	km	Item name	km
a) Retail shop		f) Public transport stop	
b) Post office		g) Bank	
c) Primary school		h) Agricultural extension service	
d) Secondary school		i) General practitioner	
e) Agricultural administration		j) Hospital	

2.4 Come regularly (at least once a week) mobile shops that sell food, bakery products, fruits, or vegetables into your village? Please circle the answer.

Yes (1) No (0)

2.5 How often a day does you have the opportunity to go by public transport to the next big urban centre? / ___ /

2.6 How long does it take you to go to the next big urban centre by "..."?

- a) Public transport system Minutes / ___ /
 b) Car Minutes / ___ /

2.7 How would you rate the quality of the streets in your region? Please circle the figure in Scale 2.7.

Scale 2.7 very poor 1 - 2 - 3 - 4 - 5 very good

Section 3: AGRICULTURE

Country/County Household	Code/Number

- 3.1 Did your household do farming before the transformation (before 1990)? Please circle the answer.
 Yes (1) No (0) **If yes, go to 3.2a, otherwise go to 3.2b.**
- 3.2a If yes for question 3.1, did your household extend its private agricultural activities after 1989? Please circle the answer.
 Yes (1) No (0) **If yes, go to 3.2c, otherwise go to 3.3.**
- 3.2b If no for question 3.1, why did your household start farming after 1989? Rate the importance of different factors from 1 to 5 according to Scale 3.2b.
- | | |
|--|------------------|
| a) Became unemployed.....RF / / | |
| b) Became pensioner.....RF / / | |
| c) Had access to land.....RF / / | |
| d) Inherited the farm.....RF / / | |
| e) To generate income.....RF / / | |
| f) To secure/improve family's supply with food.....RF / / | |
| g) Other: _____ | Go to 3.3 |
- Scale 3.2b** not important at all 1 - 2 - 3 - 4 - 5 very important
- 3.2c If yes for question 3.2a, why did your household extend its agricultural activities after 1989? Rate the importance of different factors from 1 to 5 according to Scale 3.2c.
- | | |
|--|--|
| a) Became unemployed.....RF / / | |
| b) Became pensioner.....RF / / | |
| c) Had access to land.....RF / / | |
| d) Inherited additional agricultural assets.....RF / / | |
| e) To generate income.....RF / / | |
| f) To secure/improve family's supply with food.....RF / / | |
| g) Other: _____ | |
- Scale 3.2c** not important at all 1 - 2 - 3 - 4 - 5 very important
- 3.3 How would you evaluate the family farm performance over the last 3 years? Please circle the answer.
- The farm secured some/most food for the household.....(1)
 The farm income sufficiently contributed to the household income.....(2)
 The farm income allowed for necessary (**replacement**) investments.....(3)
 The farm income allowed for additional (**expanding**) investments.....(4)

Section 3: AGRICULTURE

3.4 Do you cultivate land? Please circle the answer.

Yes (1) No (0) → If no land, but agricultural activities, go to question 3.11.

Year 2006	a) Arable land	b) Permanent pastures	c) Orchards and vineries	d) Kitchen garden	e) Total
3.5 Total own land (ha)					
3.6 Total land rented in* (ha)					
3.7 Rented in land without paying a rent (ha)					
3.8 Area rented out* (ha)					
3.9 Cultivated area (ha)					

* Monetary and in kind payments but also without payments at all

3.10 What is the average quality of your land? Please circle the figure in Scale 3.10.

Scale 3.10 very poor 1 - 2 - 3 - 4 - 5 very good

3.11 Was your household able to develop the farm over the last 3 years as it was anticipated (wished)? Please circle the answer.

Yes (1) No (0) If yes, go to 3.13.

3.12 What are the most important factors constraining the economic development of your farm? Please circle the answer.

- a) Insufficient access to financial resources/credit..... True (1) False (0)
- b) Insufficient access to inputs..... True (1) False (0)
- c) Insufficient access to new technologies..... True (1) False (0)
- d) Insufficient access to **commercial** product markets* True (1) False (0)
- e) Insufficient access to additional land..... True (1) False (0)
- f) Missing **local** agricultural product markets True (1) False (0)
- g) Do not have the qualification for extending the farm..... True (1) False (0)
- h) Necessary labour force is not available..... True (1) False (0)
- i) Too old for further investments..... True (1) False (0)
- j) Disasters (floods, droughts, epizootics)..... True (1) False (0)
- k) Other: _____ True (1) False (0)

* This refers to agricultural product purchaser, processors, contract farming, and marketing cooperatives. This does not refer to direct sales to neighbours, on streets or on small-scale local markets for agricultural products.

Crop Production

No.	3.13 Crops	3.14 Total area allocated to "..." in 2006		3.15 Total amount of the harvest in 2006		3.16 Total amount of direct own consumption in 2006		3.17 Use for feeding your livestock in 2006		3.18 Use as own seed in 2006		3.19 Sold quantity in 2006		3.20 Average price		3.21 How much did you give to relatives, friends, and neighbours without getting money in 2006?		3.22 How much did you use for exchange for other goods or services (barter) in 2006?		
		ha	#*	Unit**	#	Unit	#	Unit	#	Unit	#	Unit	#	Unit	#	Unit	#	Unit	#	Unit
(1)	Wheat																			
(2)	Corn***																			
(3)	Rye																			
(4)	Other cereals																			
(5)	Rape seed																			
(6)	Sunflower																			
(7)	Sugar Beet																			
(8)	Potatoes																			
(9)	Soybeans****																			
(10)	Fodder beets																			
(11)	Hay																			
(12)	Fodder*****																			
(13)	Vegetables*****;																			
(14)	Fruits*****;																			
(15)	Wood									XXXX	XXXX	XXXX	XXXX							
(16)	Grapes*****																			
(17)	Tobacco																			
(18)	Other: _____																			

* # stands for quantity or number of items, ** kg, dt, t, *** Excluding silage, **** Not in Poland but in Romania and Bulgaria, ***** Including maize silage but excluding hay and straw, ***** Please indicate different kind of vegetables and fruits.

Livestock

3.23a No.	3.23b Kind of animal	3.24 How many animals/hives did you have in the beginning of 2006?		3.25 How many animals/hives did you have in the end of 2006?		3.26 How many animals did you use for direct own consumption in 2006?		3.27 How many animals did you sell alive or slaughtered in 2006?		3.28 What was the average price?		3.29 How many animals did you lose** in 2006?		3.30 How much did you give to relatives, friends, and neighbours without getting money in 2006?		3.31 How much did you use for exchange for other goods or services (barter) in 2006?	
		#	Unit*	#	Unit	#	Unit	#	Unit	NC	Unit	#	Unit	#	Unit	#	Unit
(1)	Milking cows																
(2)	Cattle ≤ 12 months																
(3)	Cattle > 12 months excluding milking cows																
(4)	Sows																
(5)	Piglets ≤ 25 kg																
(6)	Fattening pigs > 25 kg																
(7)	Sheep																
(8)	Goats																
(9)	Layer hen																
(10)	Broiler																
(11)	Geese																
(12)	Ducks																
(13)	Turkey																
(14)	Rabbits																
(15)	Horses																
(16)	Bee hives						XXXX										
(17)	Other: _____																

* heads, hives, kg

** Dead or stolen animals

Other products

No.	3.32 Other products	3.33 Production in 2006		3.34 Use for direct own consumption or used for agricultural purposes in 2006		3.35 Sold quantity in 2006		3.36 Average price		3.37 How much did you give to relatives, friends, and neighbours without getting money in 2006?		3.38 How much did you use for exchange for other goods or services (barter) in 2006?	
		#	Unit*	#	Unit	#	Unit	NC	Unit	#	Unit	#	Unit
(1)	Milk												
(2)	Butter												
(3)	Cheese and other milk products												
(4)	Meat products												
(5)	Eggs												
(6)	Wool												
(7)	Honey												
(8)	Hides, leather, furs												
(9)	Flour												
(10)	Wine**												
(11)	Liquor												
(12)	Straw												
(13)	Manure												
(14)	Other: _____												

* l, pieces, kg, t

** Not only from grapes but also from fruits

Which **marketing channels** do you use to sell your **crop, livestock, and other agricultural (e.g. processed) products**? Please indicate the importance of each marketing channel on the total sales value of the product category. Please rate the importance of the different marketing channels from 1 to 5 according to Scale 3.39.

	3.39 Importance of total crop product sale value RF	3.40 Importance of total livestock sale value RF	3.41 Importance of total processed or other agricultural products sale value RF
a) Direct sales from the farm	/ ___ /	/ ___ /	/ ___ /
b) From a road stand	/ ___ /	/ ___ /	/ ___ /
c) On a local market	/ ___ /	/ ___ /	/ ___ /
d) To traders	/ ___ /	/ ___ /	/ ___ /
e) To processors	/ ___ /	/ ___ /	/ ___ /
f) To retail shops	/ ___ /	/ ___ /	/ ___ /
g) To large-scale farms	/ ___ /	/ ___ /	/ ___ /
h) Via cooperatives	/ ___ /	/ ___ /	/ ___ /
i) Contract farming	/ ___ /	/ ___ /	/ ___ /
j) Other way: _____	/ ___ /	/ ___ /	/ ___ /

Scale 3.39 not important at all 1 - 2 - 3 - 4 - 5 very important

3.42 Does the household have any problems with selling the products/the product markets? Please circle the answer.

- Yes, with the market in general (considering all products) (2)
 Yes, with selling some products (some markets) (1)
 No (0)

If no, go to question 3.44.

3.43 What are the concrete problems? Please circle the answer.

- a) No choice of marketing channels Yes (1) No (0)
 b) Missing local agricultural product markets Yes (1) No (0)
 c) No access to local agricultural product markets Yes (1) No (0)
 d) Fees for market stand are too high Yes (1) No (0)
 e) No contractual agreements Yes (1) No (0)
 f) Too high quality requirements Yes (1) No (0)
 g) Traders/other downstream agents have a too strong position.* Yes (1) No (0)
 h) Other: _____ Yes (1) No (0)

* The household sales to small quantities to negotiate higher prices.

Assets

3.44a	Forest / _____ / ha	3.44b	Value / _____ / NC/ha
3.45a	Orchards and vineyards / _____ / ha	3.45b	Value / _____ / NC/ha

3.46	Do you have any of the following agricultural assets and hand tools?	Code	Yes....(#) No.....(0)	3.46a Age	3.46b Acquisition price/purchase price	3.46c For how many years could the asset be still in use?	3.46d Durability life*	3.46e Current resale value?
	Commodity name			Years	NC/unit	Years	Years	NC/unit
	Residential houses	1a						
	Stables	1b						
	Barns	1c						
	Garages and roofs for machines	1d						
	Green houses	1e						
	Other: _____	1f						
	Tractor	2a						
	Truck	2b						
	Ploughs	2c						
	Combine	2d						
	Irrigation facilities	3						
	Other assets							
	a).....	4a						
	b).....	4b						
	Hand tools	5						

* Durability life refers to the economic lifetime (depreciation period).

Other agricultural income

What other amounts have you received in total in 2006 from your farming activities?

- 3.47 Net value received from providing a service to other farmers, for example ploughing or planting
(only if these activities will not be mentioned as self-employment activities in **Section 5**)?..... NC / _____ /
- 3.48 Net value received for providing use of agricultural tools and machinery?..... NC / _____ /
- 3.49 Total net value received for other agricultural services not listed above..... NC / _____ /

Agricultural operating expenses

3.50 What was the total amount spent on the listed items in 2006?

- a) Fertiliser (including manure)..... NC / _____ /
- b) Pesticides and other chemicals..... NC / _____ /
- c) Seeds and planting materials*..... NC / _____ /
- d) Fuel, electricity, irrigation..... NC / _____ /
- e) Maintenance and repair of machines and buildings** NC / _____ /
- f) Purchased feeding stuffs..... NC / _____ /
- g) Purchased animals..... NC / _____ /
- h) Machinery or custom services*** NC / _____ /
- i) Veterinary costs including artificial insemination..... NC / _____ /
- j) Hired labour costs NC / _____ /
- k) Rent for land or equipment NC / _____ /
- l) Taxes on land and buildings..... NC / _____ /
- m) Interest on agricultural loans..... NC / _____ /
- n) Transportation..... NC / _____ /
- o) Agricultural insurances**** NC / _____ /
- p) Payments of contribution for agricultural pensions..... NC / _____ /
- q) Other direct costs/expenses: _____ NC / _____ /

* Refers to planting materials that is yearly bought not to trees or vine.

** Do not include expenditures that will be mentioned in question 8.6.

*** Machinery service includes the machines only. Custom service includes machinery and labour.

**** Insurances for buildings, crops, livestock, machinery but **excluding** agricultural pensions

Labour allocation

Ask for all household members that are engaged in agricultural, livestock, or processing activities. Ask all household members 16 years old or older.

No.	3.51	3.52	3.53
	How many days worked "... in total on the farm, on processing of agricultural products, and on marketing in 2006	How many days and hours per day worked "... during the high season* on the farm, on processing of agricultural products, and on marketing in 2006?	How many days and hours per day worked "... during the low season on the farm, on processing of agricultural products, and on marketing in 2006?
	Days	a) Days b) Hours/day	a) Days b) Hour/day
01			
02			
03			
04			
05			
06			
07			

* High season represents season of more time-requiring spring preparations, harvesting, fall soil preparation, etc.

3.54 For how many days helped you relatives that do not belong to your household with your farm (e.g. hay making, fruit harvest, vintage) in 2006? Days / _____ /

3.55 For how many days did hired workers work on your farm in 2006? Days / _____ /

3.56 How many hours per day did hired workers work on average on your farm in 2006? Hours/day / _____ /

Section 4: POLICY SUPPORT

4.1a In the EU there are a number of regulations for agricultural production schemes and the quality of agricultural products. Have you ever heard about such regulations?

Yes (1) No (0)

If no, go to question 4.2 for Romania and Bulgaria and question 4.3 for Poland.

4.1b Which EU regulations do you expect **or** have been experiencing to have difficulties adapting to? Please rate the difficulty according to Scale 4.1.

- a) Environmental standards (e.g. protection of groundwater against pollution caused by liquid manure or pesticides, use of sewage sludge in agriculture).....RF / ___ /
- b) Animal and plant health (e.g. notification of diseases, constraint use of substances having a hormonal action, directives for use of plant protecting products).....RF / ___ /
- c) Food safety and quality standards (e.g. constraint use of antibiotics, constraint use of pesticides before harvest, identification mark for eggs).....RF / ___ /
- d) Animal welfare regulations (e.g. minimum size of animal places, forbidden production schemes).....RF / ___ /
- e) Production quotas (e.g. milk, sugar).....RF / ___ /
- f) Other: _____ RF / ___ /

Go to question 4.2 for Romania and Bulgaria and question 4.3 for Poland.

Scale 4.1 very difficult to adapt 1 - 2 - 3 - 4 - 5 no problems in adapting

4.2 Support measures (national and pre-accession) as valid in Romania in 2006

Question 4.2 is not for Poland.

List of measures and subsidies	If 4.2a Yes		If 4.2b Yes		4.2d Was your application successful?	If 4.2d Yes		4.2g Please indicate areas (no more than 3) in which you used the subsidies. Code 4.2g (next page)
	4.2a Do you know this measure/subsidy?	4.2b Have you ever applied for it?	4.2c Please rate the difficulty of the application procedure	4.2e In 2006		4.2f The sum of all contributions from this measure*	1	
Direct payments/target subsidy								
Ra) Subsidies for diesel fuel/mechanic labour	Yes... (1) No (0)	Yes... (1) No (0)	Scale 4.2c (next page)	Yes (1) No (0)	ROL	ROL		
Rb) Establishing crop fields								
Rc) Credits for production								
Rd) Milk subsidies								
Re) Meat subsidies								
Rf) Subsidies for producing high quality products								
Rg) Production in unfavourable areas								
Rh) Ewes								
Support of capital investments								
Rq) Purchase of breeding animals								
Rr) Permanent plantations								
Rs) Forests								
Rt) Buildings and equipment								
Ru) Restoration of agricultural land								
Rv) Machines (including irrigation facilities)								
Rw) Warehouses, facilities for processing								
Rx) Land purchase								

* Only for measures that pay the whole sum in yearly instalments

4.2 Continued national and pre-accession support measures as valid in Romania in 2006

List of measures and subsidies	If 4.2a Yes						If 4.2b Yes			If 4.2d Yes		4.2g Please indicate areas (no more than 3) in which you used the subsidies. Code 4.2g 1 2 3
	4.2a Do you know this measure/subsidy? Yes... (1) No(0)	4.2b Have you ever applied for it? Yes... (1) No(0)	4.2c Please rate the difficulty of the application procedure Scale 4.2c	4.2d Was your application successful? Yes..... (1) No (0)	4.2e In 2006		4.2f The sum of all contributions from this measure*	4.2g				
					ROL	ROL		1	2			
Special measures for semi-subsistence farms												
Rz) No special measure for SFH in Romania												
SAPARD												
Raa) Farm investments												
Rbb) Processing and marketing of agricultural and fishery products												
Rcc) Production methods designed to protect the environment and maintain the countryside												
Rdd) Development and diversification of economic activities												
Ree) Renovation and development of villages and the protection and conservation of rural heritages												
Rff) Improvement of vocational training							XXXX	XXXX	XXXX	XXXX	XXXX	XXXX
Rgg) Development and improvement of rural infrastructure												
Rhh) Agricultural water resource management												
Rii) Afforestation of agricultural areas, investments in private forest holdings and processing and marketing of forestry products												

* Only for measures that pay the whole sum in yearly instalments

Scale 4.2c very difficult 1 - 2 - 3 - 4 - 5 very simple

Code 4.2g

Food requirement, consumption.....	(1)	Purchase of services.....	(8)	Family car	(14)
Health requirements, medical expenses	(2)	Business equipment	(9)	Leisure activities (e.g. holidays)	(15)
Social events: marriage, death, birth	(3)	Equipment for agro tourism.....	(10)	Other:	(99)
School fees.....	(4)	Payment of labourers/employees.....	(11)		
Purchase of agricultural land.....	(5)	Repayment of loan/aid.....	(12)		
Agricultural equipment, livestock, plants, trees	(6)	Construction of house, inputs, nails, boards, etc.....	(13)		
Seasonal agricultural inputs: seeds, fertiliser, etc.....	(7)				

4.2k If for at least one measure the **application was not successful** (answer for question 4.2d is **no**), what were the reasons for your application not being successful?
Please circle the answer.

- a) Incomplete application records..... Yes (1) No (0)
- b) I did not apply in time..... Yes (1) No (0)
- c) I was not informed about the reasons..... Yes (1) No (0)
- d) Other: _____ Yes (1) No (0)

4.2l If the farmer **did not apply** for at least one measure (answer for question 4.2b is **no**), what were the reasons for not applying for the measure? Please circle the answer.

- a) We have not found it useful..... Yes (1) No (0)
- b) My neighbour, village mayor, extension expert, friend told me not to do it..... Yes (1) No (0)
- c) I was not able to get sufficient information about the application procedure..... Yes (1) No (0)
- d) The application records are too complicated to fill in..... Yes (1) No (0)
- e) I could not get the required documents..... Yes (1) No (0)
- f) I did not manage to apply in time..... Yes (1) No (0)
- g) I had to go to the administration office that is too far away..... Yes (1) No (0)
- h) My farm is too small for the measure..... Yes (1) No (0)
- i) I had to co-finance that I cannot do..... Yes (1) No (0)
- j) I am not eligible for the measure (e.g. payments for unfavoured areas)..... Yes (1) No (0)
- k) Administration costs* are too high..... Yes (1) No (0)
- l) Other: _____ Yes (1) No (0)

* Including bribes

4.2 Support measures (national and pre-accession) as valid in Bulgaria in 2006

Question 4.2 is not for Poland.

List of measures and subsidies	4.2a		4.2b		4.2c		4.2d		4.2e		4.2f		4.2g				
	Do you know this measure/subsidy?		Have you ever applied for it?		Please rate the difficulty of the application procedure		Was your application successful?		What was the received subsidy amount?		The sum of all contributions from this measure*		Please indicate areas (no more than 3) in which you used the subsidies.				
	Yes.... (1) No..... (0)	Yes (1) No..... (0)	Scale 4.2c (next page)	Yes (1) No..... (0)	Yes (1) No..... (0)	Yes (1) No..... (0)	BGN	BGN	1	2	3	Code 4.2g (next page)					
Direct payments/target subsidy																	
Ba) Produced wheat																	
Bb) Produced and sold quantity of sugar beets																	
Bc) Produced maize seed																	
Bd) Produced cotton																	
Be) Produced vegetables (tomatoes and pepper)																	
Bf) Produced and sold milk from cows, buffalos, goats, and sheep																	
Bg) Produced and sold high quality bee honey																	
Bh) Cultivation of abandoned private land																	
Bi) Breeding animals and poultry from national gene fund																	
Bj) Protection and enrichment of plant genetic fund																	
Bk) Purchasing of planting material for potatoes																	
Bl) Storage of bread wheat																	
Bm) Water for irrigating rice																	
Bn) Applying of pilot schemes of compensation payments for producers in unfavourable areas																	
Bo) Compensation of damages from 2005 flood in regions that are specialised in wheat and barley producers																	
Bp) Organic farming																	
Support of capital investments																	
Bq) Import of breeding animals (heifers, rams, and ewes)																	
Br) Plantation of vine and orchards																	
Bs) Plantation of oil bearing roses																	
Bt) Construction or reconstruction of greenhouses for vegetable production																	
Bu) Construction of apiaries																	
Bv) Covering part of the expenditures for interests over the grace period for the investment																	
Bw) Equipment for flour mills, bakery and confectionery industry																	

* Only for measures that pay the whole sum in yearly instalments

4.2 Continued national and pre-accession support measures as valid in Bulgaria in 2006

List of measures and subsidies	4.2a		If 4.2a Yes		4.2b Have you ever applied for it? Yes... (1) No (0)	4.2c Please rate the difficulty of the application procedure Scale 4.2c	4.2d Was your application successful? Yes..... (1) No..... (0)	If 4.2d Yes		4.2g Please indicate areas (no more than 3) in which you used the subsidies. Code 4.2g
	Do you know this measure/subsidy?		What was the received subsidy amount?							
	Yes... (1) No.... (0)	Yes... (1) No (0)	4.2c In 2006	4.2f The sum of all contributions from this measure*						
Special measures for semi-subsistence farms										
Bz) No special measure for SFH in Bulgaria										
SAPARD										
Baa) Farm investments										
Bbb) Processing and marketing of agricultural and fishery products										
Bcc) Production methods designed to protect the environment and maintain the countryside										
Bdd) Development and diversification of economic activities										
Bee) Renovation and development of villages and the protection and conservation of rural heritages										
Bff) Improvement of vocational training								XXXX	XXXX	XXXX
Bgg) Development and improvement of rural infrastructure										
Bhh) Agricultural water resource management										
Bii) Afforestation of agricultural areas, investments in private forest holdings and processing and marketing of forestry products										

* Only for measures that pay the whole sum in yearly instalments

Scale 4.2c very difficult 1 - 2 - 3 - 4 - 5 very simple

Code 4.2g

Food requirement, consumption.....	(1)	Purchase of services.....	(8)	Family car.....	(14)
Health requirements, medical expenses.....	(2)	Business equipment.....	(9)	Leisure activities (e.g. holidays).....	(15)
Social events: marriage, death, birth.....	(3)	Equipment for agro tourism.....	(10)	Other:.....	(99)
School fees.....	(4)	Payment of labourers/employees.....	(11)		
Purchase of agricultural land.....	(5)	Repayment of loan/aid.....	(12)		
Agricultural equipment, livestock, plants, trees.....	(6)	Construction of house, inputs, nails, boards, etc.....	(13)		
Seasonal agricultural inputs: seeds, fertiliser, etc.....	(7)				

4.2k If for at least one measure the **application was not successful** (answer for question 4.2d is **no**), what were the reasons for your application not being successful? Please circle the answer.

- a) Incomplete application records. Yes (1) No (0)
- b) I did not apply in time. Yes (1) No (0)
- c) I was not informed about the reasons. Yes (1) No (0)
- d) Other: _____ Yes (1) No (0)

4.2l If the farmer **did not apply** for at least one measure (answer for question 4.2b is **no**), what were the reasons for not applying for the measure? Please circle the answer.

- a) We have not found it useful. Yes (1) No (0)
- b) My neighbour, village mayor, extension expert, friend told me not to do it. Yes (1) No (0)
- c) I was not able to get sufficient information about the application procedure. Yes (1) No (0)
- d) The application records are too complicated to fill in. Yes (1) No (0)
- e) I could not get the required documents. Yes (1) No (0)
- f) I did not manage to apply in time. Yes (1) No (0)
- g) I had to go to the administration office that is too far away. Yes (1) No (0)
- h) My farm is too small for the measure. Yes (1) No (0)
- i) I had to co-finance that I cannot do. Yes (1) No (0)
- j) I am not eligible for the measure (e.g. payments for unfavoured areas). Yes (1) No (0)
- k) Administration costs* are too high. Yes (1) No (0)
- l) Other: _____ Yes (1) No (0)

* Including bribes

4.3 EU measures for Poland for 2006

List of measures and subsidies

	If 4.3a Yes				If 4.3b Yes			If 4.3d Yes		4.3g Please indicate areas (no more than 3) in which you used the subsidies. Code 4.3g (page 26)
	4.3a Do you know this measure/subsidy?	4.3b Have you ever applied for it?	4.3c Please rate the difficulty of the application procedure	4.3d Was your application successful?	4.3e What was the received subsidy amount?		4.3f The sum of all contributions from this measure*			
					Yes .. (1) No.....(0)	Yes... (1) No....(0)		In 2006	2006-2012	
Pa) Single area payment scheme										
Rural Development measures										
Pb) Training										
Pc) Setting up young farmers										
Pd) Early retirement										
Pe) Agricultural advisory and extension service support										
Pf) Investments in agricultural holdings										
Ph) Improving processing and marketing of agricultural products										
Pj) Improving and developing infrastructure related to agriculture										
Pk) Restoring forestry production potential damaged by natural disaster and/or fire and introducing appropriate preventive measures										
Pn) Promoting producer groups										
Pop) Farming in handicapped areas										
Prs) Agri-environment and animal welfare payments										
Pu) First afforestation of agricultural land										
Paa) Diversification into non-agricultural activities										
Peeff) Rural renewal and preservation and protection of cultural heritage										
Pxx) Land re-parcelling										
Pyy) Agricultural water resource management										

* Only for measures that pay the whole sum in yearly instalments

4.3 Continued EU measures for Poland for 2006

List of measures and subsidies	If 4.3a No		4.3i Will you think about an application in the future? Yes(1) go to 4.3j No.....(0) next row	4.3j Please indicate possible areas (no more than 3) in which you would use the subsidies. Code 4.3j (page 26)		
	4.3h Would you rate it as useful/ interesting for your farm/household? Scale 4.3h (page 26)			1	2	3
Pa) Single area payment scheme						
Rural Development measures						
Pb) Training				XXXX	XXXX	XXXX
Pc) Setting up young farmers						
Pd) Early retirement						
Pe) Agricultural advisory and extension service support						
Pf) Investments in agricultural holdings						
Ph) Improving processing and marketing of agricultural products						
Pj) Improving and developing infrastructure related to agriculture						
Pk) Restoring forestry production potential damaged by natural disaster and/or fire and introducing appropriate preventive measures						
Pn) Promoting producer groups				XXXX	XXXX	XXXX
Pop) Farming in handicapped areas						
Prs) Agri-environment and animal welfare payments						
Pu) First afforestation of agricultural land						
Paa) Diversification into non-agricultural activities						
Peeff) Rural renewal and preservation and protection of cultural heritage						
Pxx) Land re-parcelling						
Pyy) Agricultural water resource management						

4.3k If for at least one measure the **application was not successful** (answer for question 4.3d is **no**), what were the reasons for your application not being successful?
Please circle the answer.

- a) Incomplete application records..... Yes (1) No (0)
- b) I did not apply in time. Yes (1) No (0)
- c) I was not informed about the reasons. Yes (1) No (0)
- d) Other: _____ Yes (1) No (0)

4.3l If the farmer **did not apply** for at least one measure (answer for question 4.3b is **no**), what were the reasons for not applying for the measure? Please circle the answer.

- a) We have not found it useful..... Yes (1) No (0)
- b) My neighbour, village mayor, extension expert, friend told me not to do it..... Yes (1) No (0)
- c) I was not able to get sufficient information about the application procedure. Yes (1) No (0)
- d) The application records are too complicated to fill in..... Yes (1) No (0)
- e) I could not get the required documents..... Yes (1) No (0)
- f) I did not manage to apply in time..... Yes (1) No (0)
- g) I had to go to the administration office that is too far away..... Yes (1) No (0)
- h) My farm is too small for the measure..... Yes (1) No (0)
- i) I had to co-finance that I cannot do..... Yes (1) No (0)
- j) I am not eligible for the measure (e.g. payments for unfavoured areas)..... Yes (1) No (0)
- k) Administration costs* are too high..... Yes (1) No (0)
- l) Other: _____ Yes (1) No (0)

* Including bribes

4.3 EU measure for Bulgaria for 2007

Measure	4.3a Do you know this measure/subsidy?	If 4.3a Yes		If 4.3b Yes		4.3d Was your application successful?	If 4.3d Yes		4.3g Please indicate areas (no more than 3) in which you used the subsidies.
		4.3b Have you ever applied for it?	4.3c Please rate the difficulty of the application procedure	4.3c Scale 4.3c (page 29)	4.3e What was the received subsidy amount? In 2006		4.3e Code 4.3g (page 29)		
Ba) Single area payment scheme	Yes... (1) No....(0)	Yes... (1) No(0)	Scale 4.3c (page 29)	Yes(1) No.....(0)	BGN		1 2	3	

Measure	If 4.3a No		4.3i Will you think about an application in the future?	4.3j Please indicate possible areas (no more than 3) in which you would use the subsidies.
	4.3h Would you rate it as useful/interesting for your farm/household?	4.3i Yes...(1) go to 4.3j No....(0) go to question 4.4		
Ba) Single area payment scheme	Scale 4.3h (page 29)		Yes... (1) No....(0)	Code 4.3j (page 29) 1 2 3

4.3k If for at least one measure the application was not successful (answer for question 4.3d is no), what were the reasons for your application not being successful? Please circle the answer.

- a) Incomplete application records. Yes (1) No (0)
- b) I did not apply in time. Yes (1) No (0)
- c) I was not informed about the reasons.... Yes (1) No (0)
- d) Other: _____ Yes (1) No (0)

4.3l If the farmer did not apply for at least one measure (answer for question 4.3b is no), what were the reasons for not applying for the measure? Please circle the answer.

- a) We have not found it useful Yes (1) No (0)
- b) My neighbour, village mayor, extension expert, friend told me not to do it Yes (1) No (0)
- c) I was not able to get sufficient information about the application procedure..... Yes (1) No (0)
- d) The application records are too complicated to fill in. Yes (1) No (0)
- e) I could not get the required documents. Yes (1) No (0)
- f) I did not manage to apply in time..... Yes (1) No (0)
- g) I had to go to the administration office that is too far away..... Yes (1) No (0)
- h) My farm is too small for the measure. Yes (1) No (0)
- i) I had to co-finance that I cannot do..... Yes (1) No (0)
- j) I am not eligible for the measure (e.g. payments for unfavoured areas)..... Yes (1) No (0)
- k) Administration costs* are too high..... Yes (1) No (0)
- l) Other: _____ Yes (1) No (0)

* Including bribes

4.4 The European Union provides **special support for non-commercial (semi-subsistence) farms**. For Poland a payment up to 1250 € per year for five years is agreed. The payment can be granted to all farms that submit a business plan. For Poland all columns are valid and refer to 2006.

Measure	If 4.4a Yes				If 4.4b Yes		If 4.4d Yes	
	4.4a Do you know this measure/subsidy?	4.4b Have you ever applied for it?	4.4c Please rate the difficulty of the application procedure	4.4d Was your application successful?	4.4e What was the received subsidy amount?	4.4f In 2006	4.4g Please indicate areas (no more than 3) in which you used the subsidies.	4.4h Code 4.4g
Semi-subsistence payment	Yes... (1) No....(0)	Yes .. (1) No.... (0)	Scale 4.4c	Yes.....(1) No(0)	PLN		1 2 3	

Measure	If 4.4a No		4.4i		4.4j	
	4.4h Would you rate it as useful/interesting for your farm/household?	4.4i Will you think about an application in the future?	4.4j Please indicate possible areas (no more than 3) in which you would use the subsidies.		Code 4.4j	
Semi-subsistence payment	Scale 4.4h	Yes..... (1) go to 4.4j No(0) go to 4.5	1	2	3	

Scale 4.3c, 4.4c, 4.5c very difficult 1 - 2 - 3 - 4 - 5 very simple

Code 4.3g, 4.3j, 4.4g, 4.4j, 4.5g, 4.5j

Food requirement, consumption.....	(1)	Purchase of services.....	(8)	Family car.....	(14)
Health requirements, medical expenses.....	(2)	Business equipment.....	(9)	Leisure activities (e.g. holidays).....	(15)
Social events: marriage, death, birth.....	(3)	Equipment for agro tourism.....	(10)	Other:.....	(99)
School fees.....	(4)	Payment of labourers/employees.....	(11)		
Purchase of agricultural land.....	(5)	Repayment of loan/aid.....	(12)		
Agricultural equipment, livestock, plants, trees.....	(6)	Construction of house, inputs, nails, boards, etc.....	(13)		
Seasonal agricultural inputs: seeds, fertiliser, etc.....	(7)				

Scale 4.3h, 4.4h, 4.5h not useful/interesting at all 1 - 2 - 3 - 4 - 5 very useful/interesting

If the household applied for the measure (answer for question 4.4b is **yes**), please **answer question 4.4m otherwise go to 4.4l**.

4.4m How much did it cost to prepare the business plan? PLN or in kind payments / _____ / _____ or % of requested subsidy / _____ / _____

If the application was not successful (answer for question 4.4d is **no**), please answer question 4.4k.

4.4k What were the reasons for your application not being successful? Please circle the answer.

- a) Incomplete application records Yes (1) No (0)
- b) I did not apply in time..... Yes (1) No (0)
- c) I was not informed about the reasons..... Yes (1) No (0)
- d) Other: _____ Yes (1) No (0)

If the household did not apply for the measure (answer for question 4.4b is **no**), please answer question 4.4l.

4.4l Why have you not applied for the measure? Please rate the reasons according to Scale 4.4l.

- a) We have not found it useful RF / _____
- b) My neighbour, village mayor, extension expert, friend told me not to do it RF / _____
- c) I was not able to get sufficient information about the application procedure..... RF / _____
- d) The application records are too complicated to fill in..... RF / _____
- e) I could not get the required documents..... RF / _____
- f) I did not manage to apply in time..... RF / _____
- g) I had to go to the administration office that is too far away..... RF / _____
- h) Administration costs* are too high..... RF / _____
- i) It was too difficult to prepare the business plan..... RF / _____
- j) We did not come up with an idea about a possible business plan..... RF / _____
- k) We wanted to engage a firm/consultant for the development of the business plan but the service was too expensive..... RF / _____
- l) Other: _____ RF / _____

* Including bribes

Scale 4.4l not relevant at all 1 - 2 - 3 - 4 - 5 very relevant

4.4 The European Union provides **special support for non-commercial (semi-subsistence) farms**. The payment can be granted to all farms for a maximum of five years that submit a business plan. In **Romania** the measure is still not implemented. As it is likely that this measure will be implemented, the question has to be asked as a possibility for 2008.

Measure	4.4a Do you know this measure/ subsidy? Yes ..(1) No....(0)	4.4h Would you rate it as useful/ interesting for your farm/household? Scale 4.4h	4.4i Will you think about an application in the future? Yes(1) go to 4.4j No(0) go to Section 5	4.4j Please indicate possible areas (no more than 3) in which you would use the subsidies. Code 4.4j 1 2 3
Semi-subsistence payment				

Code 4.3g, 4.3j, 4.4g, 4.4j, 4.5g, 4.5j

Food requirement, consumption.....	(1)	Purchase of services.....	(8)	Family car.....	(14)
Health requirements, medical expenses.....	(2)	Business equipment.....	(9)	Leisure activities (e.g. holidays).....	(15)
Social events: marriage, death, birth.....	(3)	Equipment for agro tourism.....	(10)	Other:.....	(99)
School fees.....	(4)	Payment of labourers/employees.....	(11)		
Purchase of agricultural land.....	(5)	Repayment of loan/aid.....	(12)		
Agricultural equipment, livestock, plants, trees.....	(6)	Construction of house, inputs, nails, boards, etc.....	(13)		
Seasonal agricultural inputs: seeds, fertiliser, etc.....	(7)				

Scale 4.3h, 4.4h, 4.5h not useful/interesting at all 1 - 2 - 3 - 4 - 5 very useful/interesting

4.4 The European Union provides **special support for non-commercial (semi-subsistence) farms**. The payment can be granted to all farms for a maximum of five years that submit a business plan. For **Bulgaria** the question is hypothetical refers to 2008 (1500 € will be paid).

Measure	4.4a Do you know this measure/ subsidy?	4.4h Would you rate it as useful/ interesting for your farm/household?	4.4i Will you think about an application in the future?	4.4j Please indicate possible areas (no more than 3) in which you would use the subsidies. Code 4.4j
Semi-subsistence payment	Yes .. (1) No....(0)	Scale 4.4h	Yes(1) go to 4.4j No(0) go to Section 5	1 2 3

Scale 4.3c, 4.4c, 4.5c very difficult 1 - 2 - 3 - 4 - 5 very simple

Code 4.3g, 4.3j, 4.4g, 4.4j, 4.5g, 4.5j

Food requirement, consumption.....	(1)	Purchase of services.....	(8)	Family car.....	(14)
Health requirements, medical expenses.....	(2)	Business equipment.....	(9)	Leisure activities (e.g. holidays).....	(15)
Social events: marriage, death, birth.....	(3)	Equipment for agro tourism.....	(10)	Other:.....	(99)
School fees.....	(4)	Payment of labourers/employees.....	(11)		
Purchase of agricultural land.....	(5)	Repayment of loan/aid.....	(12)		
Agricultural equipment, livestock, plants, trees.....	(6)	Construction of house, inputs, nails, boards, etc.....	(13)		
Seasonal agricultural inputs: seeds, fertiliser, etc.....	(7)				

Scale 4.3h, 4.4h, 4.5h not useful/interesting at all 1 - 2 - 3 - 4 - 5 very useful/interesting

4.5 National measures as valid in **Poland** in 2006. Question 4.5 is not for Romania and Bulgaria.

Measures	If 4.5a Yes				If 4.5d Yes What was the received subsidy amount? 4.5e In 2006	4.5g Please indicate areas (no more than 3) in which you used the subsidies. Code 4.5g (page 26)
	4.5a Do you know this measure/ subsidy?	4.5b Have you ever applied for it?	If 4.5b Yes 4.5c Please rate the difficulty of the application procedure	4.5d Was your application successful?		
P a) Subsidies for fuel	Yes.. (1) No ... (0)	Yes... (1) No (0)	Scale 4.5c (page 26)	Yes(1) No(0)	PLN	1 2 3

Measures	If 4.5a No		4.5i Will you think about an application in the future?	4.5j Please indicate possible areas (no more than 3) in which you would use the subsidies. Code 4.5j (page 26)
	4.5h Would you rate it as useful/ interesting for your farm/ household?	4.5i Yes .. (1) go to 4.5j No.... (0) go to Section 5		
P a) Subsidies for fuel	Scale 4.5h (page 26)			1 2 3

4.5k If the **application was not successful** (answer for question 4.5d is **no**), what were the reasons for your application not being successful?
 Please circle the answer.

- a) Incomplete application records..... Yes (1) No (0)
- b) I did not apply in time. Yes (1) No (0)
- c) I was not informed about the reasons. Yes (1) No (0)
- d) Other:..... Yes (1) No (0)

4.5l If the farmer **did not apply** for the measure (answer for question 4.5b is **no**), what were the reasons for not applying for the measure? Please circle the answer.

- a) We have not found it useful Yes (1) No (0)
- b) My neighbour, village mayor, extension expert, friend told me not to do it Yes (1) No (0)
- c) I was not able to get sufficient information about the application procedure..... Yes (1) No (0)
- d) The application records are too complicated to fill in..... Yes (1) No (0)
- e) I could not get the required documents..... Yes (1) No (0)
- f) I did not manage to apply in time..... Yes (1) No (0)
- g) I had to go to the administration office that is too far away..... Yes (1) No (0)
- h) My farm is too small for the measure..... Yes (1) No (0)
- i) I had to co-finance that I cannot do..... Yes (1) No (0)
- j) I am not eligible for the measure (e.g. payments for unfavoured areas)..... Yes (1) No (0)
- k) Administration costs* are too high..... Yes (1) No (0)
- l) Other:..... Yes (1) No (0)

* Including bribes

Section 5: NON-FARM FAMILY BUSINESS (self-employment)

Country/County	Code/Number
Household	

Note: Ask to all household members that are engaged in self-employment activities and are 16 years old or older. If no household member is engaged in self-employed activities, go to Section 6.

5.1	5.2	5.3	5.4	5.5	5.6a	5.6b	5.6c	5.7
What are the self-employment activities (family businesses) that the household was involved in during 2006?	When did you start the activity?	Did you stop the activity during 2006?	How much did the household make in cash and in kind from these activities on average per month during 2006?	How stable do you rate the income from the activity? Scale 5.5	How many hired persons did you employ for the activity?	How many days* did you employ them during 2006?	How much did you pay them per day?	How much direct operational costs** did the household have for running the activity?
Activity codes, description of activity if necessary	Year	Yes.....(1) No.....(0)	NC	RF	Yes... (#) No(0) → go to 5.7	Days	NC/day	NC
No. Activity Code	Activity							
A				/ /				
B				/ /				
C				/ /				
D				/ /				

* If there is more than one employee, please sum up the total number of days for all employees.

** Direct operational costs: costs for inputs, marketing costs, costs for transportation, Labour costs are not included into direct operational costs.

Activity Codes

None	(0)	Beautician, hair dresser.....	(29)	Agronomists, veterinary and forestry experts.....	(2)	Glass and china industry	(64)
Trade.....	(20)	Tailoring, embroidery, knitting.....	(30)	Lecturers, teachers, researchers etc	(44)	Textile industry	(65)
Transport.....	(21)	Security service.....	(31)	Legal staff, lawyer.....	(45)	Fur and leather, shoe-making.....	(66)
Agro tourism.....	(36)	Car repair	(32)	Medical Doctor.....	(46)	Food industry, food processing.....	(67)
Other tourism.....	(22)	Construction sector, carpentry	(33)	Security and defence staff, army, police.....	(47)	Wires, electric, and electronic industry	(68)
Public and social services	(23)	Artisan, crafts.....	(34)	Economist, Financial accounting experts	(48)	Other physical labour related professions.....	(79)
Restaurant, catering	(24)	Communication sector	(35)	Religion.....	(49)		
Sales person.....	(25)	Other service activities.....	(39)	Other intellectual professions.....	(59)		
Health care, nurse	(26)	Intellectual professions, management (agriculture 2, other 40-59)		Physical labour/industry related professions (agriculture 1, other 60-79)			
Financial service	(27)	Local authorities	(40)	Agricultural/forestry sector	(1)		
Janitors, cleaning	(28)	Party and government officials.....	(41)	Primary sector: miner, energy	(60)		
		Managers of private and public enterprises.....	(42)	Metallurgists, foundry workers	(61)		
		Engineering and technical experts	(43)	Chemical, petrochemical, and rubber industry	(62)		
				Wood processing, pulp and paper industry.....	(63)		

Scale 5.5 very instable (on occasion only and not calculable) 1 - 2 - 3 - 4 - 5 very stable (every month a calculable income)

Activity Name of activity	5.8 On average how many months per year does "... " spend in activity A, B, C, D... in total?				5.9 On average, how many hours per day does "... " spend in activity A, B, C, D... in total?			
	Months/year				Hours/day			
	A	B	C	D	A	B	C	D
01								
02								
03								
04								
05								
06								
07								

5.10 What were the reasons for establishing the non-farm family business? Please circle the answer.

Note: This question is directed to household member(s) operating the non-farm family business or should be answered from his/her/their perspective(s).

- a) Better income opportunity than alternative income prospects..... True (1) False (0)
- b) To use the family's economic capacity most effective/productive True (1) False (0)
- c) Innovative product/ identification of market opportunity..... True (1) False (0)
- d) To ensure the households living standard/ generate cash income..... True (1) False (0)
- e) To smooth income/to compensate for unstable returns from agriculture..... True (1) False (0)
- f) Missing employment alternatives for me and the family members..... True (1) False (0)
- g) Prestige of running own business, increase of social status..... True (1) False (0)
- h) To invest available capital..... True (1) False (0)
- i) To generate income to invest in agriculture..... True (1) False (0)
- j) To benefit from governmental (policy) support..... True (1) False (0)
- k) Other:..... True (1) False (0)

5.11 Was the household able to develop the self-employment activities during the last 3 years as it was anticipated (wished)? Please circle the answer.

Yes (1) No (0) **If yes, go to 5.13.**

5.12 What are most important constraints hindering the development of self-employment activities as anticipated? Please circle the answer.

- a) Insufficient access to financial resources/credit..... True (1) False (0)
- b) Insufficient access to inputs..... True (1) False (0)
- c) Insufficient access to new technologies..... True (1) False (0)
- d) Insufficient access to commercial product markets..... True (1) False (0)
- e) Insufficient knowledge or skills..... True (1) False (0)
- f) Necessary labour forces are not available..... True (1) False (0)
- g) Too old for further investments..... True (1) False (0)
- h) Financial risks are too high..... True (1) False (0)
- i) Lack of product demand..... True (1) False (0)
- j) Remoteness..... True (1) False (0)
- k) Too many competitors..... True (1) False (0)
- l) Other:..... True (1) False (0)

5.13 What are your future intentions/wishes related to your non-farm family business? Use Code 5.13.

Activity	Name of activity	
A		/ / /
B		/ / /
C		/ / /
D		/ / /

Code 5.13

- To drop the activity.....(1)
- To reduce the scale of this activity.....(2)
- To retain the activity as it is.....(3)
- To extent the activity or further diversify.....(4)

Section 6: DEPENDENT EMPLOYMENT (working for a salary or commission for somebody else)

Note: Ask to all household members which are engaged in dependent employment and which are 16 years old or older. → If no household member is engaged in dependent employment go to 6.18!

No.	6.1 How many off-farm dependent jobs have "... " had in 2006?	6.2 What is/was "... 's main* off-farm dependent job?	6.3 Since when has "... " been working in this employment?	6.4 Did "... " stop the activity during 2006?	6.5 What is/was the type of employer that "... " works for?	6.6 How far away is/was this job from the (farm-) house?	6.7 How many months did "... " work in this employment in 2006?	6.8 What was the take home pay (net income) received per month	6.9 How high were monthly costs related to this employment (travelling expenses, clothing, means for work)?
		Activity code	Year	Yes..... (1) No..... (0)	Public..... (1) Private..... (2)	km	Months	NC	NC
01									
02									
03									
04									
05									
06									
07									

* refers to time spent

Activity Codes

None	(0)	Beautician, hair dresser.....	(29)	Agronomists, veterinary and forestry experts.....	(2)	Glass and china industry	(64)
Trade.....	(20)	Tailoring, embroidery, knitting.....	(30)	Lecturers, teachers, researchers etc	(44)	Textile industry	(65)
Transport.....	(21)	Security service.....	(31)	Legal staff, lawyer.....	(45)	Fur and leather, shoe-making	(66)
Agro tourism.....	(36)	Car repair	(32)	Medical Doctor.....	(46)	Food industry, food processing.....	(67)
Other tourism.....	(22)	Construction sector, carpentry	(33)	Security and defence staff, army, police.....	(47)	Wires, electric, and electronic industry	(68)
Public and social services	(23)	Artisan, crafts.....	(34)	Economist, Financial accounting experts	(48)	Other physical labour related professions.....	(79)
Restaurant, catering	(24)	Communication sector	(35)	Religion.....	(49)	Unspecified profession.....	(99)
Sales person	(25)	Other service activities.....	(39)	Other intellectual professions.....	(59)		
Health care, nurse	(26)	Intellectual professions, management (agriculture 2, other 40-59)		Physical labour/industry related professions (agriculture 1, other 60-79)			
Financial service.....	(27)	Local authorities	(40)	Agricultural/forestry sector	(1)		
Janitors, cleaning	(28)	Party and government officials.....	(41)	Primary sector: miner, energy	(60)		
		Managers of private and public enterprises.....	(42)	Metallurgists, foundry workers	(61)		
		Engineering and technical experts	(43)	Chemical, petrochemical, and rubber industry	(62)		
				Wood processing, pulp and paper industry.....	(63)		

If uncertain about code please specify above in table!

If one household member has more than one dependent off-farm employment (see 6.1), please answer the questions in the following table. **Otherwise go to 6.18!**

No.	6.10 What is/was "...s second off-farm dependent job? (If 0, go to next person)	6.11 Since when has "...s been working in this employment? Year	6.12 Did "...s" stop the activity during 2006? Yes (1) No..... (0)	6.13 What is/was the type of employer that "... works for? Public..... (1) Private..... (2)	6.14 How far away is/was this job from the (farm-) house? km	6.15 How many months did "...s" work in this employment in 2006? Months	6.16 What was the take home pay (net income) received per month NC	6.17 How high were monthly costs related to this employment (travelling expenses, clothing, means for work)? NC
01								
02								
03								
04								
05								
06								
07								

Activity Codes

None	(0)	Beautician, hair dresser.....	(29)	Agronomists, veterinary and forestry experts.....	(2)	Glass and china industry	(64)
Service Sector (20-39)		Tailoring, embroidery, knitting.....	(30)	Lecturers, teachers, researchers etc.....	(44)	Textile industry	(65)
Trade.....	(20)	Security service.....	(31)	Legal staff, lawyer.....	(45)	Fur and leather, shoe-making.....	(66)
Transport.....	(21)	Car repair.....	(32)	Medical Doctor.....	(46)	Food industry, food processing.....	(67)
Agro tourism.....	(36)	Construction sector, carpentry	(33)	Security and defence staff, army, police.....	(47)	Wires, electric, and electronic industry	(68)
Other tourism.....	(22)	Artisan, crafts.....	(34)	Economist, Financial accounting experts	(48)	Other physical labour related professions.....	(79)
Public and social services	(23)	Communication sector.....	(35)	Religion.....	(49)		
Restaurant, catering	(24)	Other service activities.....	(39)	Other intellectual professions.....	(59)		
Sales person.....	(25)	Intellectual professions, management (agriculture 2, other 40-59)		Physical labour/industry related professions (agriculture 1, other 60-79)			
Health care, nurse	(26)	Local authorities	(40)	Agricultural/forestry sector.....	(1)	Unspecified profession.....	(99)
Financial service.....	(27)	Party and government officials.....	(41)	Primary sector: miner, energy	(60)	If uncertain about code please specify above in table!	
Janitors, cleaning	(28)	Managers of private and public enterprises.....	(42)	Metallurgists, foundry workers	(61)		
		Engineering and technical experts	(43)	Chemical, petrochemical, and rubber industry.....	(62)		
				Wood processing, pulp and paper industry.....	(63)		

Go to Section 7.

Note: Ask households in which **at least one member is unemployed** (code 7 or 8 for question 1.5). When no household member is unemployed, go to **Section 7**.

No.	6.18 Has "... " actively looked for a dependent employment over the last 12 months? Yes (1) No..... (0)	6.19 Please identify the most important factor which hinders the dependent employment. Code 6.19	6.20 Does "... " plan to look for a dependent employment in the next three years? Yes..... (1) No..... (0)
01			
02			
03			
04			
05			
06			
07			

Code 6.19

There are no job opportunities "... " would know off.....	(1)
There are no job opportunities for "... "s qualification " "... " would know off.....	(2)
There are job opportunities, but the transport or costs of moving is/are too expensive.....	(3)
There are job opportunities, but "... " has/there are no means of transportation for reaching them.....	(4)
There are job opportunities; however, the payment is so low that this is not really an alternative.....	(5)
" "... " is interested in dependent employment, but cannot really engage in this employment because of the family farm/the family demands.....	(6)
People of "... "s age are not demanded on the labour market.....	(7)
Other factors:.....	(99)

Section 7: OTHER CASH INFLOWS

7.1 Did your household apply for at least one loan at a **formal** institution (e.g. bank, credit union) in 2006? Please circle the answer.

Yes (1) No (0) **If no, go to 7.7**

7.2 If yes, did your household get at least one loan (also in partial) for which it applied? Please circle the answer.

Yes (1) No (0) **If no, go to 7.7**

Credit	7.3 How was this loan/these loans utilised? Please use Code 7.3.			7.4 What was the source of the loan(s)? Institution/organisation/type Code 7.4	7.5 Amount of loan(s)? NC	7.6 Interest rate per annum %
	1. utilisation Code	2. utilisation Code	3. utilisation Code			
1						
2						
3						

Code 7.3

- Food requirement, consumption..... (1)
- Health requirements, medical expenses..... (2)
- Social events: marriage, death, birth..... (3)
- School fees..... (4)
- Purchase of agricultural land..... (5)
- Agricultural equipment, livestock, plants, trees..... (6)
- Seasonal agricultural inputs: seeds, fertiliser..... (7)
- Purchase of services..... (8)
- Business equipment..... (9)
- Equipment for agro tourism..... (10)
- Payment of labourers/employees..... (11)
- Repayment of other loan/aid..... (12)
- Construction of house, inputs, boards, etc..... (13)
- Family car..... (14)
- Leisure activities (e.g. holidays)..... (15)
- Other:..... (99)

Code 7.4

- Bank..... (1)
- Credit union/cooperative..... (2)
- Input supply company..... (3)
- Processor..... (4)
- Product purchaser..... (5)
- Others:..... (99)

Code 7.8

- Relative..... (1)
- Friend..... (2)
- Neighbours..... (3)
- Acquaintances..... (4)
- Moneylender..... (5)
- Others:..... (99)

7.7 Did you get any loan from **private** persons? Please circle the answer.

Yes (1) No (0) **If no, go to 7.12**

Credit	7.8 From whom did you get the credit? Please use Code 7.8	7.9 Amount of loan? NC	7.10 Interest rate per annum %	7.11 How was the loan utilised? Please use Code 7.3		
				1. utilisation Code	2. utilisation Code	3. utilisation Code
1						
2						
3						

7.12 Is there anyone (e.g. an absent household member) sending money to your household in 2006? Please circle the answer.

No..... (0)
Yes..... (1), **if yes, 7.12a** NC / /

7.13 Did the household receive any other contributions in kind during 2006? Please circle the answer.

No..... (0)
Yes..... (1), **if yes, 7.13a** NC / /

* We want to know how much **it would have cost the household to buy all the things that were brought to the household.**

- 7.14 How much did the household receive from " ..." in 2006?
- a) Old age pensions..... NC / /
 - b) Other pension (veterans, disabled, etc.)..... NC / /
 - c) Unemployment benefits..... NC / /
 - d) Job search related programs..... NC / /
 - e) Social assistance payments..... NC / /
 - f) Other social payments (e.g. child benefits)..... NC / /
 - g) Other: _____ NC / /
- 7.15 Does your household participate in tax reduction programs due to the agricultural activity? Please circle the answer.
- Yes (1) No (0)
- 7.16 Does your household participate in a governmental pension program that was special designed for farmers (e.g. KRUS)? Please circle the answer.
- Yes (1) No (0)
- 7.17 Did your family receive any income from " ..." in 2006?
- a) Income from financial assets..... NC / /
 - b) Income from partnerships NC / /
 - c) Revenue from lotteries..... NC / /
 - d) Rent from real estate assets..... NC / /
 - e) Revenues from renting out land..... NC / /
 - f) Other: _____ NC / /
 - bb) In kind receipts* NC / /
 - cc) In kind receipts* NC / /
 - dd) In kind receipts* NC / /
 - ee) In kind receipts* NC / /
 - ff) In kind receipts* NC / /

* We want to know how much it would have cost the household to buy all the things that were brought to the household in kind.

Section 8: HOUSEHOLD EXPENDITURES

Note: If not mentioned differently, we ask for **average** expenditures **per month** in 2006. If the interviewee gives you yearly expenditures, please mark them by "/12".

<p>8.1 How much money did you spend in cash on food on average per month? NC / _____ / _____</p> <p>8.2 If the household consumes food products from own production could you estimate how much you had to pay if you had to buy them per month? NC / _____ / _____</p> <p>8.3 How much was spent on personal items per month? 301 Cigarettes, tobacco, and alcohol NC / _____ / _____ 302 Cultural activities NC / _____ / _____ 303 Hygiene products NC / _____ / _____ 304 Hair cut NC / _____ / _____ 305 Books, newspapers NC / _____ / _____</p> <p>8.4 How much was spent on transport* per month? 401 Gas and oil NC / _____ / _____ 402 Car service, maintenance NC / _____ / _____ 403 Public transport NC / _____ / _____</p> <p>* Do not include expenditures mentioned before for farming, self employed activities, and dependent work!</p>	<p>8.5 How much money was spent on schooling per month? 501 Tuition NC / _____ / _____ 502 School uniform** NC / _____ / _____ 503 School meals NC / _____ / _____ 504 School books NC / _____ / _____ 505 Kindergarten NC / _____ / _____ 506 Other NC / _____ / _____</p> <p>8.6 How much was spent on "... " on average per month?*: 601 District heating NC / _____ / _____ 602 Electricity NC / _____ / _____ 603 Gas, coal, oil, wood NC / _____ / _____ 604 Other energy sources NC / _____ / _____ 605 Water NC / _____ / _____ 606 Waste collection NC / _____ / _____ 607 Rent for house/apartment NC / _____ / _____ 608 Private telephone (incl. mobile) NC / _____ / _____ 609 Internet NC / _____ / _____</p> <p>8.7 How much was spent on "... " on average per month?*: 701 Clothes and shoes NC / _____ / _____ 702 Household items (repair, furniture, etc.) NC / _____ / _____ 703 Health care (doctor, medicine, optical equipment, etc.) NC / _____ / _____ 704 Mortgage of house NC / _____ / _____ 705 Interest and re-payments for loans*** NC / _____ / _____ 706 Hire purchases, leasing NC / _____ / _____ 707 Insurance**** NC / _____ / _____ 708 Other monthly expenditure NC / _____ / _____</p> <p>** Only if there is such a uniform requested from the school. It does not refer to civil clothes that are worn in school. *** Excluding interests mentioned for agricultural loans in question 3.50m. **** Excluding costs for agricultural insurances mentioned in 3.50o and 3.50p.</p>	<p>8.8 How much was spent on "... " in 2006 (yearly expenditures) 801 Jewellery and Presents NC / _____ / _____ 802 Holidays NC / _____ / _____</p> <p>8.9 How much did the household save or dis-save in 2006? Saving + NC: / _____ / _____ or Dis-saving - NC: / _____ / _____</p> <p>8.10 Have you undertaken any extraordinary expenditures/investments in 2006? Please circle the answer. Yes (1) _____ No (0) _____ If no, go to 8.11</p> <p>If yes, please indicate the kind of expenditures/investments: a) _____ NC / _____ / _____ b) _____ NC / _____ / _____ c) _____ NC / _____ / _____</p> <p>8.11 Have you supported anyone (e.g. an absent household member, friends) with money? Please circle the answer. Yes (1) _____ No (0) _____ If no, go to Section 9</p> <p>8.12 If yes, please indicate the amount of money paid in 2006. NC / _____ / _____</p>
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Section 9: EXPECTED FARM, HOUSEHOLD'S, AND MARKETS' DEVELOPMENTS

9.1 What type of changes do you expect on the agricultural product market within the next 5 to 10 years? Please circle the answer.

- a) In general, we expect that the development on the market for agricultural products will worsen our sale opportunities..... True (1) False (0)
- b) We expect an increase in competition..... True (1) False (0)
- c) We expect an opening of a supermarket in the next town..... True (1) False (0)
- d) The opportunities for selling our products will not change..... True (1) False (0)
- e) We retain the existing way of selling our products..... True (1) False (0)
- f) The local market will vanish..... True (1) False (0)
- g) We will be able to sell through traders..... True (1) False (0)
- h) We will be able to sell through large-scale farms..... True (1) False (0)
- i) We will be able to sell through producer/marketing organisations..... True (1) False (0)
- j) Other market development (please indicate): True (1) False (0)

9.2 What kind of changes do you expect on the **land market** in your region within the next 5 to 10 years? Please circle the answer.

Rental market		Sale market	
a) Amount of offered land:	b) Prices:	c) Amount of offered land:	d) Prices:
more land offered..... (1)	increase..... (1)	more land offered..... (1)	increase..... (1)
no change..... (0)	no change..... (0)	no change..... (0)	no change..... (0)
less land offered..... (-1)	decrease..... (-1)	less land offered..... (-1)	decrease..... (-1)

9.3 What kind of changes do you expect on the **labour market in general** in your region within the next 5 to 10 years? Please circle the answer.

In towns		In rural areas	
a) Amount of offered jobs:	b) Wages:	c) Amount of offered jobs:	d) Wages:
more jobs offered..... (1)	increase..... (1)	more jobs offered..... (1)	increase..... (1)
no change..... (0)	no change..... (0)	no change..... (0)	no change..... (0)
less jobs offered..... (-1)	decrease..... (-1)	less jobs offered..... (-1)	decrease..... (-1)

9.4 What kind of changes do you expect on the **labour market for people with a strong agricultural background** in your region within the next 5 to 10 years? Please circle the answer.

a) Opportunities for part-time employment:	b) Opportunities for full-time employment:
will improve..... (1)	will improve..... (1)
no change..... (0)	no change..... (0)
will worsen..... (-1)	will worsen..... (-1)

Section 9: EXPECTED FARM, HOUSEHOLD'S, AND MARKETS' DEVELOPMENTS

9.5 What kind of changes do you expect for the **prices** of "..." within the next 5 to 10 years? Please circle the answer.

a) Agricultural products: increase (1) no change (0) decrease (-1)	b) Variable inputs (seeds, fertiliser, etc.): increase more than the prices for agricultural products..... (2) increase less than the prices for agricultural products..... (1) no change (0) will decrease (-1)	c) Fixed inputs (tools, machinery, equipment): increase more than the prices for agricultural products..... (2) increase less than the prices for agricultural products..... (1) no change (0) will decrease (-1)
---	--	---

9.6 What kind of changes do you expect on the **credit market** within the next 5 to 10 years? Please circle the answer.

In general		For family farms to invest in agriculture	
a) Access to credit: will be better (1) no change (0) will worsen (-1)	b) Conditions*: will be easier to comply with (1) no change (0) will be more difficult to comply with (-1)	c) Access to credit: will be better (1) no change (0) will worsen (-1)	d) Conditions*: will be easier to comply with (1) no change (0) will be more difficult to comply with (-1)

* Interest rate, collateral

9.7 Where do you see your farm within the next 5 to 10 years? What are your future intentions? Please circle the answer.

- Stop farming (completely, without subsistence production)..... (1) **Go to 9.8**
- Keep farm, but only for subsistence/hobby..... (2) **Go to 9.9**
- Reduce farm activity (3) **Go to 9.9**
- Continue in the farming activity as it is today (only replacement investment)..... (4) **Go to 9.12**
- Modernise the farm equipment/buildings but keep the same extent of land/animal herd size..... (5) **Go to 9.14**
- Extend the farming activity **without significant modernisation** (6) **Go to 9.13**
- Extend the farming activity **with significant modernisation**..... (7) **Go to 9.13**
- Other: _____ **Enumerator decides about the continuing question**
(99)

9.8

What will the household members do in the case of farming **abandoning**?

Use Code 9.8.

No.	Code 9.8
	Find an off-farm employment – part time in the country (1)
	Find an off-farm employment – full time in the country..... (2)
	Find an off-farm employment – full/part time abroad..... (3)
	Retire regularly (4)
	Retire early..... (5)
	Register unemployed (6)
	Stay at home (without registering unemployed) (7)
	Establish an own business..... (8)
	Other: _____ (99)
01	
02	
03	
04	
05	
06	
07	
	Go to 9.10

9.9

What will the household members do in the case of **reducing** farming activities?

Use Code 9.9.

No.	Code 9.9
	Find an off-farm employment – part time in the country (1)
	Find an off-farm employment – full time in the country (2)
	Find an off-farm employment – full/part time abroad..... (3)
	Retire regularly (4)
	Retire early (5)
	Register unemployed..... (6)
	Stay at home (without registering unemployed)..... (7)
	Establish an own business (8)
	Will continue working on the farm only..... (9)
	Other: _____ (99)
01	
02	
03	
04	
05	
06	
07	

- 9.10 What are the reasons for intending **abandoning or reducing** farming? Please circle the answer.
- | | | |
|---|----------|-----------|
| a) We are too old to continue..... | True (1) | False (0) |
| b) We do not have a successor for farming..... | True (1) | False (0) |
| c) We are no longer interested in farming..... | True (1) | False (0) |
| d) We need better income possibilities..... | True (1) | False (0) |
| e) The access to credits is limited..... | True (1) | False (0) |
| f) It is too difficult for us to adapt to the EU regulations (hygiene, animal welfare, etc.)... | True (1) | False (0) |
| g) We expect a stronger competition on agricultural markets..... | True (1) | False (0) |
| h) We expect positive developments on labour markets..... | True (1) | False (0) |
| i) We expect negative developments on agricultural product markets..... | True (1) | False (0) |
| j) We expect negative developments on the agricultural variable input market..... | True (1) | False (0) |
| k) We expect negative developments on the agricultural fixed input market..... | True (1) | False (0) |
| l) We expect a decrease of agricultural policy support..... | True (1) | False (0) |
| m) We expect a reduction of other policy support..... | True (1) | False (0) |
| n) We expect an increase of support from social security programmes..... | True (1) | False (0) |
| o) We will make use of an early retirement programme..... | True (1) | False (0) |
| p) Other (please indicate): _____ | True (1) | False (0) |
- 9.11 What will the household/your heirs do with the abandoned land? Please circle the answer.
- | | |
|---|------|
| Keep the land unused..... | (1) |
| Rent out the land to private farmers | (2) |
| Rent out the land to corporate farms | (3) |
| Sell land..... | (4) |
| Other: _____ | (99) |

Go to Section 10

- 9.12 What are the reasons for **continuing the farming activity** as it is today (with **only replacement investment**)? Please circle the answer.
- | | | |
|---|----------|-----------|
| a) We extended our farming activities in previous years thus made the farm competitive..... | True (1) | False (0) |
| b) We invested sufficiently in previous years in technology thus made the farm competitive..... | True (1) | False (0) |
| c) We cover the cash needs of the household mainly from off-farm income..... | True (1) | False (0) |
| d) The farm will sufficiently cover the needs of the household if it continues producing in the same way..... | True (1) | False (0) |
| e) We do not expect any significant changes in the product market or competition..... | True (1) | False (0) |
| f) We (some family members) are waiting for off-farm employment opportunities..... | True (1) | False (0) |
| g) We do not dispose of any means to invest in the farm modernisation or extension..... | True (1) | False (0) |
| h) We do not have a successor who would take over the farm later..... | True (1) | False (0) |
| i) We are in an age when it does not make sense to invest into the farm..... | True (1) | False (0) |
| j) We do not have the possibility of renting or purchasing more land..... | True (1) | False (0) |
| k) Others (please indicate): _____ | True (1) | False (0) |

Go to Section 10

- 9.13 Do you intend "..."? Please circle the answer.

- | | | |
|---|---------|--------|
| a) To rent in more land..... | Yes (1) | No (0) |
| b) To purchase some land..... | Yes (1) | No (0) |
| c) To introduce other crops..... | Yes (1) | No (0) |
| d) To enlarge your animal herd..... | Yes (1) | No (0) |
| e) To introduce other animals..... | Yes (1) | No (0) |
| f) To diversify to processing (producing cheese, wine or meat products).... | Yes (1) | No (0) |
| g) To diversify to agro tourism..... | Yes (1) | No (0) |
| h) Other: _____ | Yes (1) | No (0) |

- 9.14 What are the reasons for **modernising or extending** farming activity? Please circle the answer.

- | | | |
|--|----------|-----------|
| a) We need to increase farm productivity..... | True (1) | False (0) |
| b) We see it as the only way to survive on the market..... | True (1) | False (0) |
| c) We do not see other employment alternatives for the family members in the near future..... | True (1) | False (0) |
| d) The farm has a successor who has large ambitions with the farm..... | True (1) | False (0) |
| e) We received/plan to apply for a policy support for modernisation/extension of the farm..... | True (1) | False (0) |
| f) We expect an increase in direct policy support..... | True (1) | False (0) |
| g) Other: _____ | True (1) | False (0) |

Section 10: SOCIAL CAPITAL

10.1 What are the relations to other farmers (private and corporate) in your surrounding? Please rate the relations according to Scale 10.1.

- a) Fellow small-scale farmers...../___/
- b) Larger-scale private farmers...../___/
- c) Corporate farms...../___/

Scale 10.1	hostile (1)	bad relations (2)	no relations (3)	good relations (4)	mutual help (5)	10.3	10.4
						How often a year does you cooperate?	Are the cooperation mainly: Formal**(3) Informal but regularly(2) Informal(1)?
a) Fellow small-scale farmers							
b) Private farmers							
c) Corporate farms							

* hay making, fruit harvest, vintage, etc. ** written contracts

10.5	10.6
Are you (or one of your household members) member of "...."?	For non-members only. If you or one of your household members would be asked to become a member in "... " how would you react?
Yes..... (1) → go to Section 11 No..... (0)	Become a member (1) Refuse to become a member..... (0)
a) Input supply coop	
b) Marketing coop	
c) Producer coop	
d) Milk co-operatives***	
e) Saving and credit coop	
f) Women association	
g) Youth association	
h) Agricultural association	
i) Producer association (e.g. sugar, wheat, etc.)	
j) Political party	
k) Other	

* Are called producer groups in Poland.

** Do not exist in Poland.

*** This is specific for Poland where milk is collected from private producers by the co-operative and then processed. The co-operative also markets the products. Not all farmers that sell their milk to the co-operatives are members.

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Title: Economic prospects for semi-subsistence farm households in EU New Member States

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Abstract

This report presents a study of the economic situation of semi-subsistence farm households (SFHs) in New Member States and of their prospects for development under the stimulus of various EU agricultural policy measures. The project was carried out by the Institute for Prospective Technological Studies (JRC-IPTS), and focuses on agricultural holdings of very small economic size that market only part of their farm output. The results are based on a survey of SFHs in Poland, Romania and Bulgaria conducted in 2007. The detailed survey questionnaire, administered by local experts, covered the full economic and socio-demographic situation of each farm household, its preferences and attitudes regarding various relevant non-economic issues, and its expectations about the future. A final sample of 489 SFHs, distributed across the three countries, forms the basis for the empirical analysis.

The main objectives of the study are to describe SFHs according to their socio-economic characteristics, and to assess the impact of various EU rural development measures on their socio-economic sustainability. It assumes that SFHs act rationally within their constraints but that, in addition, their decisions are conditioned by socio-psychological aspects.

A two-step cluster analysis identified four typical SFH profiles, namely rural non-farm oriented households, rural pensioners and deprived households, large-scale semi-subsistence farm households, and rural households with undeveloped potential. These household types are statistically and behaviourally distinct from each other, and are shown to respond differently to policy stimuli. The policy measures analysed, singly or in combination, using multi-objective linear programming are the single area payment scheme (SAPS), farm investment support, support for diversification into non-agricultural activities, early retirement support, and transitional semi-subsistence support.

It is found that none of these policy measures improves the economic prospects of all types of SFH. Moreover, the ranking of policy measures according to their impact varies between SFH type, and to a lesser extent, across countries. In broad terms, it emerges that policies such as pension and social security schemes are likely to be more appropriate for improving the situation of the first two categories of SFH (rural, non-farm oriented households and rural pensioners), whereas the last two categories (larger, commercially-oriented households and households with undeveloped potential), can benefit from sectoral policies aimed at investment in farming and in off-farm diversification, respectively.

The main policy implications are that a one-size-fits-all approach is inappropriate and that a judicious and flexible combination of sectoral and social policies is required. Horizontal policies to stimulate, for example, the provision of micro-credit, the development of various types of human capital and cooperative activities would also have a role to play.

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