

# THE SUSTAINABILITY OF MANAGEMENT STRUCTURES IN BULGARIAN AGRICULTURE – LEVEL, FACTORS AND PROSPECTS

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**Abstract:** *This paper assesses the sustainability of the farms in our country by applying the holistic approach. We first introduce the methods employed in our research and provide a general description of the farms included in it. Then we assess the integral, managerial, economic, social and environmental sustainability of farms in general as well as that of the different types of farms according to their size, specialization of production, environmental position and geographical location. Finally, we assess the factors for improving the sustainability of farms and present our conclusions about doing further research work and improving the assessment practice in the sector.*

**Keywords:** sustainability of farms, managerial, economic, social, environmental aspects.

**JEL:** Q12, Q18, Q56, Q57.

**A**ssessing the multilateral aspects of the sustainability of different types of farms has become a major issue both theoretically and practically (Bachev, 2006, 2016; Ivanov et al, 2009; Yovchevska, 2016; Koteva, 2016; Kaneva, 2015; Hadzhieva et al, 2005.; Andreoli and Tellarini, 2000; Bachev, 2005, 2006, 2011, 2016, 2017; Bachev and Petters, 2005; Bastianoni et al., 2001; EC, 2001; FAO, 2013; Fuentes, 2004; Hani et al., 2006; OECD, 2001; Rigby et al., 2001; Sauvenier et al., 2005; UN, 2015), yet no empirical research has been conducted so far of the socio-economic sustainability of the major management structures which currently exist in our agriculture.

By applying the holistic approach, this research paper evaluates the absolute and the relative sustainability of the main types of farms in Bulgaria –physical entities, sole proprietors, cooperatives, companies and other partnerships. After introducing the methods we have employed in our research, the paper assesses the integral, the managerial, the economic and the environmental sustainability of farms with different types of legal structure. Finally, the factors and prospects for sustainable development of farm structures in our country are reviewed.

## The methodology of the research

To assess the absolute and the comparative sustainability of management structures in Bulgarian agriculture, a holistic approach is applied to the evaluation of the managerial, economic, social, and environmental aspects of sustainability in the specific conditions, which exist in our country. The approach consists of a hierarchical system of 12 principles, 21 criteria and 45 indicators and reference values. Their contents, justification, selection method, calculation and integration have been presented in detail in an earlier publication in this journal (Bachev, 2016).

The major types of management structures in Bulgarian agriculture are farms of physical entities which have not been formally registered and farms which have been legally registered as Sole proprietors, Cooperatives, Companies and other types of partnerships.

The evaluation of their sustainability level is based on a survey conducted among the managers of various types of 'representative' farms in the summer of 2016. The survey was conducted in collaboration with the National Agricultural Advisory Service and major professional associations of farmers to identify 'typical' farms in terms of their features and location. The sustainability of individual farms was determined based on the evaluation which their managers provided for each indicator according to a four-level scale – 'high/higher or better than the average for the sector/in the region'; 'similar/good'; 'low/lower or worse than the average for the sector/in the region'; 'negative/unacceptable/unsatisfactory'. The qualitative values given for each farm were then quantified and transformed into a Sustainability Index for each indicator (SI(i)) by applying the following grading scale: 1 for 'High'; 0.66 for 'Good or Average'; 0.33 for 'Low' and 0 for 'Unsatisfactory or Unacceptable' sustainability. To classify the farms by their specialization and geographical and environmental location, the official categorization of agricultural holdings in the country was employed. The interviewed managers had to define their farms as being 'mainly for subsistence'; 'of small, medium or large size for the sector'; 'located in a lowland, lowland-mountain, or mountain area'. This approach was applied to ensure an adequate assessment since the managers of the farms are most knowledgeable about the specific features and the characteristics of their farms in comparison to the other entities in the region and (sub)sector.

The integral evaluation of the sustainability of farms includes a set of Criteria, Principles, and Aspects applied to evaluate their overall sustainability level. Equal weight is attributed to each Principle of a given Aspect, as well as to each Criterion for a specific Principle and to each Indicator for a specific Criterion. A Panel of experts defined the following levels of sustainability for interpreting the quantitative values of the indexes: 'High' – for values ranging from 0.84 to 1; 'Good' – for values ranging from 0.5 to 0.82; 'Low' – for values ranging from 0.22 to 0.49; 'Unsustainable' – for values ranging from 0 to 0.2. The overall and the individual (Aspect, Principle, Criterion, Indicator) Sustainability Indexes about the holdings of a specific type were calculated as the average of the Indexes of the individual farms in the group.

The survey was conducted among 190 registered agricultural producers who represent 0.2% of the farmers registered in compliance with Ordinance No. 3 from 1999

on establishing and maintaining a register of agricultural producers. The type of structure and the significance of the farms included in the survey is an approximate match of the real structure of farms in the country.

The majority of the respondents are physical entities (natural persons) who own small and medium-sized farms; a significant number of the respondents own farms which are mainly for subsistence; and only a small number of the respondents own large farms. Most of the farms of physical entities (natural persons) specialize in permanent crops; grazing livestock; mixed crop and livestock farming; mixed crops; vegetables, flowers and mushrooms and in field crops, while a small number of them specialise in mixed livestock farming and in pigs, poultry and rabbits. Their farms are located mainly in Lowland and Lowland-Mountain areas, while a smaller number of farms are located in Mountain areas, in Mountain areas of natural constraint, in Protected areas and territories and in Lowland areas of natural constraint. A comparatively large share of the farms registered as physical entities are located in the North Central and South Central regions, while the number of those in the Northwest, Northeast, Southwest and Southeast regions is smaller.

Nearly 37% of the farms of Sole proprietors are small or medium-sized for the sector, while one in every four managers runs a large farm. A quarter of these farms specialize in Field crops; a quarter specialize in Permanent crops and a third quarter specialize in Grazing livestock. Twelve per cent specialize in Vegetables, flowers and mushrooms and in Mixed Crop Farming. Half of the farms registered as Sole proprietors are mainly located in Lowland areas, the other half being in Lowland-mountain areas, while none of the managers of Sole proprietorships has a farm in a Mountain area, in an area of Natural constraint, or in Protected zones and territories. The majority of the farms registered as Sole proprietors are in the Northwest and the Southeast regions, the rest of them being in the Northeast and the Southwest regions.

In the group of farms registered as Companies and other partnerships, the majority of respondents are managers of farms registered as companies, while 5.88% of them are managers of General partnerships. The majority of Companies and other partnerships identify their farms as Medium-sized; nearly a half are reported as Large farms, and the percentage of Small-sized farms is below 6%. Most of the farms of this type specialize in Field crops or in Mixed crops farming; a large share of the farms specializes in Mixed crop and livestock farming, while the share of farms specializing in Permanent crops or Grazing livestock is smaller. The farms registered as Companies and other partnerships are mainly located in Lowland areas, whereas the rest of them are evenly spread in Lowland-mountain areas and Mountain areas. A large part of these farms has their land in Protected Areas and Territories or are located in Mountain areas of natural constraint. Most of them are in the South Central and North Central regions, while the rest are evenly spread across the other administrative regions of the country.

A large number of the Cooperatives included in our survey are Medium-sized farms, while the rest of them are Large. The majority of Cooperatives specialize in Field crops; a significant number of them specialize in Mixed crops and livestock farming, while the rest specialize in Pigs, poultry and rabbits. More than half of the Cooperatives are in Lowland areas; a large number of farms run as cooperatives are in Lowland-mountain areas and only a small number of them are in Mountain areas and in Mountain

and Lowland areas of natural constraint. The greatest number of Cooperatives are in the Northeast and North Central regions; followed by the smaller number of cooperatives in the South Central region. The rest of the Cooperatives are evenly spread in the other three administrative regions of the country.

### The sustainability level of the agricultural structures

The multi-index evaluation of the sustainability level of the agricultural holdings included in our survey shows that the integral Index of the general sustainability of farms is 0.55, which indicates a good sustainability level of the farms in the country (Figure 1). The higher values are those of the Indexes of the environmental (0.61) and the social (0.57) sustainability of farms, while the values of the Indexes of the managerial (0.52) and the economic (0.5) sustainability approximated the lower margins of the level of good sustainability. This is an indicator that the improved management and the economic sustainability of Bulgarian farms are of crucial importance.

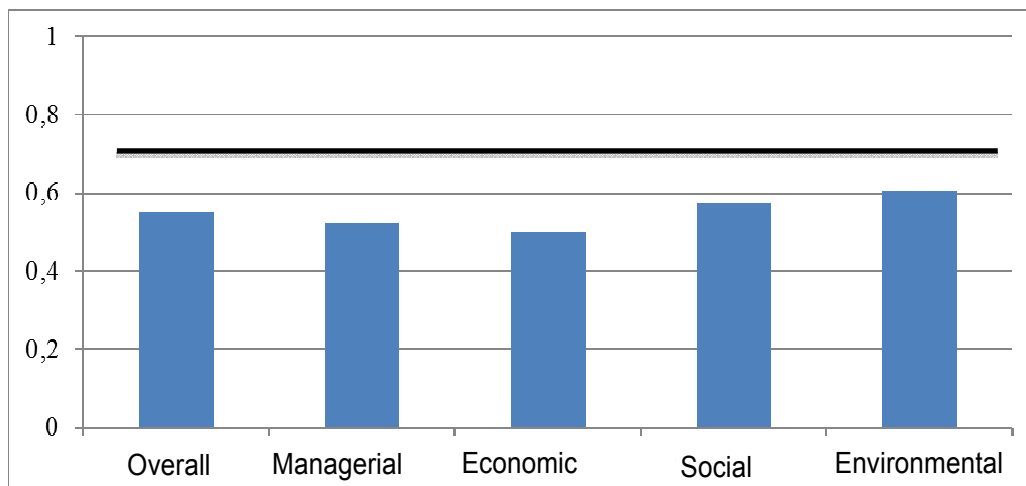


Figure 1. Sustainability indexes of Bulgarian farms  
Source: A survey conducted among farm managers, July 2016.

The analysis of the individual indexes by major sustainability principles, criteria and indicators allows us to identify the components contributing to the sustainability levels we have identified for the different aspects of the sustainability of Bulgarian farms. The managerial and the economic sustainability of farms, for example, are relatively low due to the fact that the Index of the managerial efficiency (0.49) and the Index of financial stability (0.47) of farms are low (Figure 2). We also established that in spite of the relatively high overall environmental sustainability of the farms in Bulgaria, the Index of farmland conservation (0.52) and the Index of biodiversity conservation (0.56) are comparatively low and crucial to maintaining the level of sustainability achieved so far.

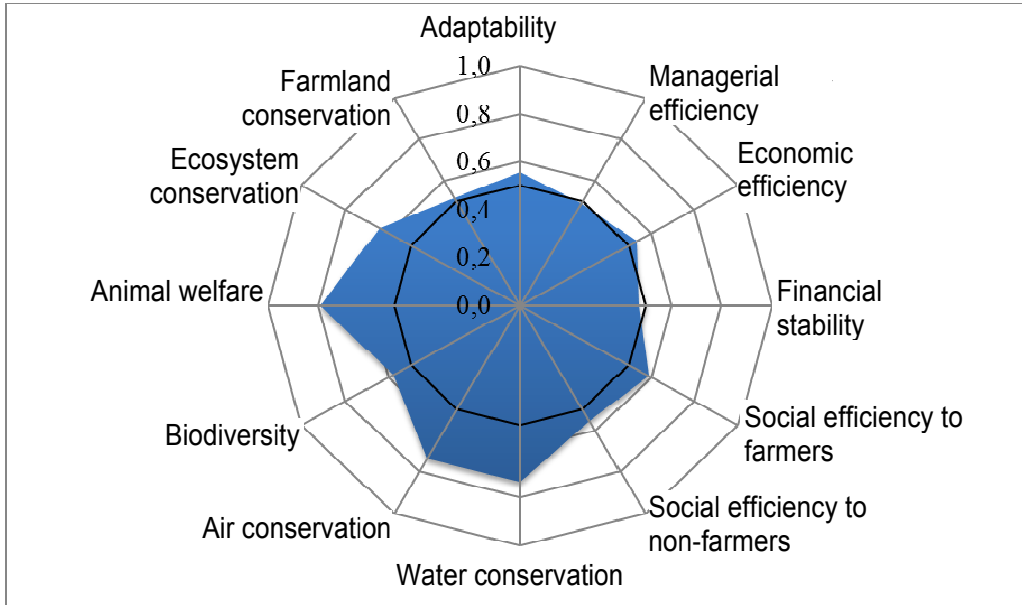


Figure 2. Sustainability indexes of farms by major sustainability principles  
 Source: A survey conducted among farm managers, July 2016.

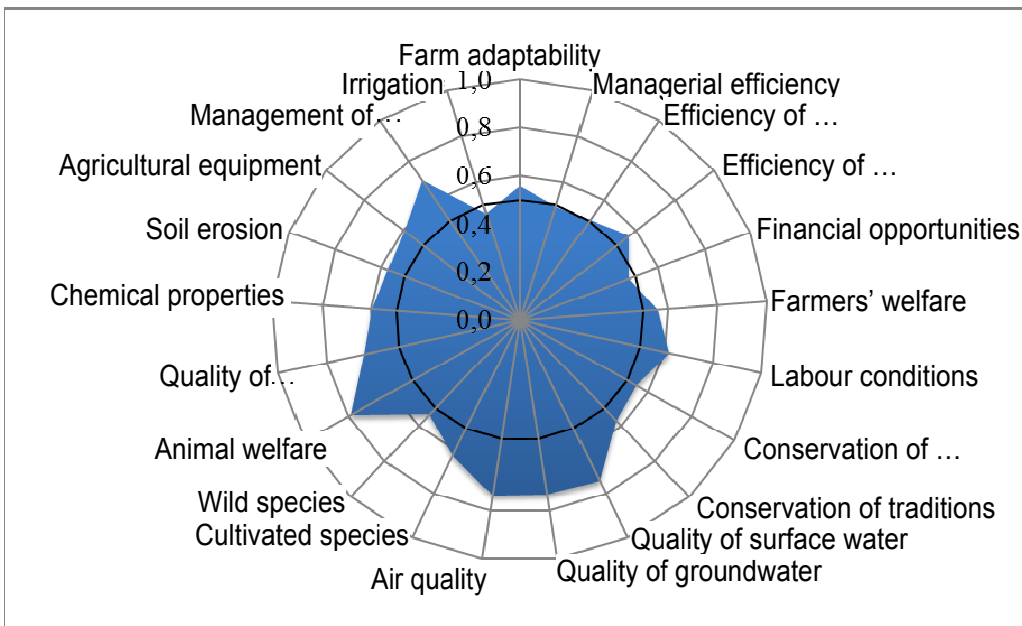


Figure 3. Sustainability indexes of farms by individual sustainability criteria  
 Source: A survey conducted among farm managers, July 2016.

The in-depth analysis we conducted by individual criteria and indicators enabled us to analyse in detail the elements which raise or lower the sustainability level of farms.

Thus, the low levels of the Comparative Managerial Efficiency and of the Financial opportunities (Figure 3) are determined by the low Comparative efficiency of short-term assets supply in terms of an alternative organisation (0.28), the insufficient Return on equity (0.41) and the Overall liquidity (0.48) of the farms (Figure 4). Similarly, the low levels of the Indexes of Farmland conservation and Biodiversity conservation are determined by the insufficient rate of Applying the recommended rates of irrigation (0.46), the high degree of Water erosion of soil (0.55) and the decreasing Number of wild species on the territory of the farms (0.53).

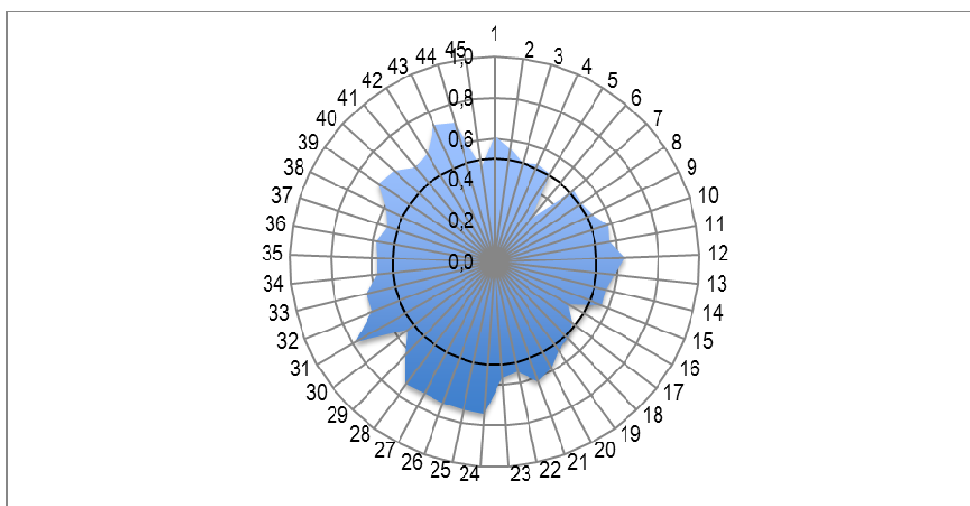


Figure 4. Indicators\* for assessing the sustainability of management structures in agriculture

Source: A survey conducted among farm managers, July 2016.

\*1- Level of adaptability to market conditions; 2-Level of adaptability to the institutional environment; 3-Level of adaptability to the natural environment; 4-Comparative efficiency of labour resources supply and management; 5- Comparative efficiency of natural resources supply and management; 6- Comparative efficiency of short-term assets supply and management; 7- Comparative efficiency of long-term assets supply and management; 8- Comparative efficiency of innovations supply and management; 9- Comparative efficiency of finance supply and management; 10-Comparative efficiency of managing the sales of the agricultural produce; 11- Level of labour productivity; 12- Land productivity; 13-Animal productivity; 14-Profitability of production; 15-Profitability of the farm; 16-Return on equity; 17-Overall liquidity; 18- Financial autonomy; 19- Income per member of the farm household; 20- Satisfaction with the farming activity; 21- Compliance with legal requirements; 22- Contribution to community conservation; 23- Contribution to the conservation of traditions; 24- Nitrates concentration in water; 25-Pesticides concentration in water; 26-Nitrates concentration in groundwater; 27-Pesticides concentration in groundwater; 28-Degree of air pollution; 29-Number of crops; 30-Number of wild species on the territory of the farm; 31-Degree of compliance with animal welfare requirements; 32-Degree of conservation of ecosystem services; 33- Organic contents of soil; 34-Soil acidity; 35-Soil salinity; 36-Degree of wind erosion; 37-Degree of water erosion; 38-Crop rotation; 39-Number of animals per unit area; 40-Sodium fertilizer rate; 41-Potassium fertilizer rate; 42-Phosphorus fertilizer rate; 43-Level of implementing good agricultural practices; 44-Manure storage method; 45-Degree of irrigation.

The low levels of the indicators highlight the specific areas in which the sustainability level of farms needs to be improved by introducing adequate changes in the strategies of the farms and/or in the public policies related to farm structures. Thus, although the overall Farm adaptability is comparatively high (0.56), the Adaptability of farms to environmental changes (climate, natural disasters, etc.) is comparatively low (0.5). It is therefore necessary to adopt measures for enhancing this type of adaptability through trainings, dissemination of information, better agricultural equipment, improved structures of production, better varieties of crops, innovating the technology and the organisation, etc.

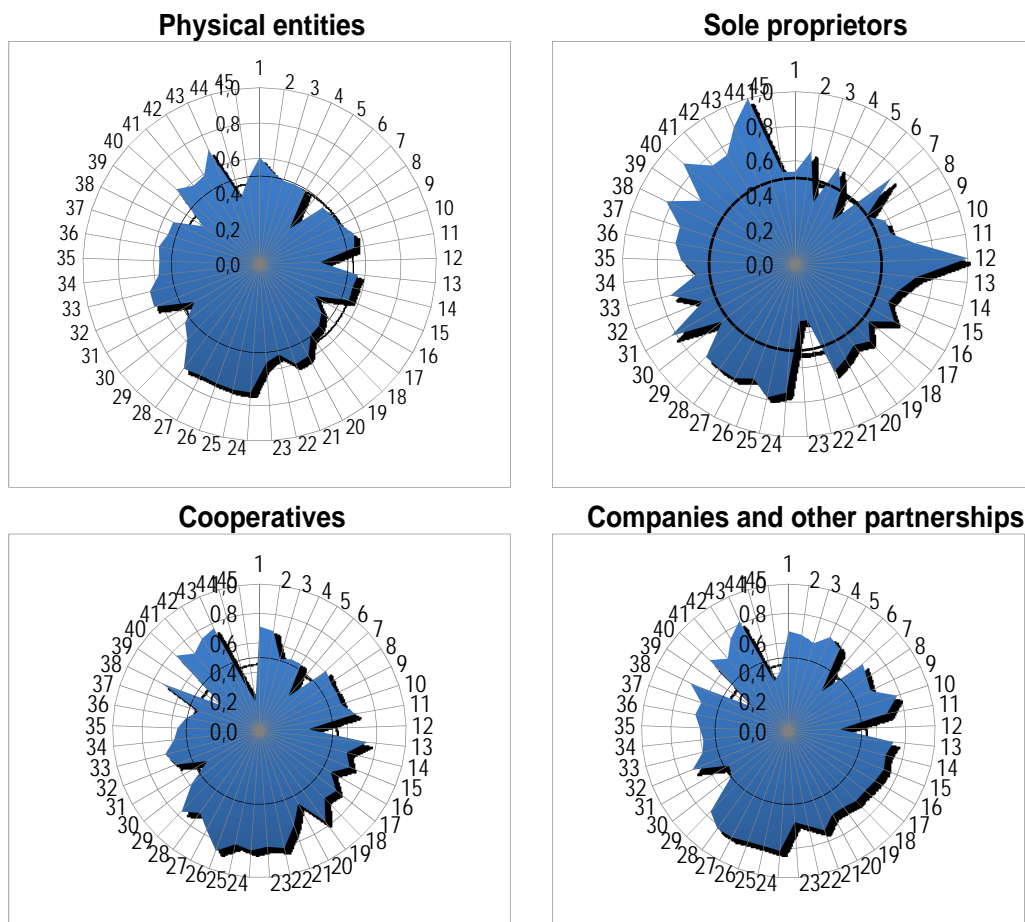
On the other hand, the high values of some indicators reveal the absolute and comparative advantages of Bulgarian farms in terms of sustainable development. Currently, these refer mainly to complying with the requirements on the Animal welfare; the Conservation of surface water and groundwater in terms of their nitrates and pesticides contents; the Conservation of air; the Implementation of good agricultural practices; the minimum Number of animals per unit area; acceptable Labour conditions; Satisfaction with the farming activity; the optimum Animal productivity; good Adaptability to the market (prices, competition, demand, etc.) and the Comparative efficiency of managing the sales of the agricultural produce.

### **Sustainability indicators of farms with different types of management structures**

Sustainability indicators vary widely among the farms of different legal structure.

The values of a large number of sustainability indicators of the farms registered as physical entities are low, which results in their lower sustainability by individual aspects and in their lower overall sustainability (Figure 5). In terms of the managerial aspect of their sustainability, these farms have low levels of Adaptability to the natural environment (0.49) and Comparative efficiency of the supply and management of labour resources (0.49), land (0.49), long-term assets (0.48) and innovation (0.49), and especially short-term assets (0.26). As for the economic aspect, the sustainability of Physical entities is particularly low in terms of Animal productivity (0.34), Return on equity (0.36), Overall liquidity (0.44) and Financial autonomy (0.48). As far as the social aspect is concerned, their sustainability is low only in terms of Income per member of the farm household (0.49), while in terms of the environmental aspect, their sustainability is low by the indexes of Number of animals per unit area (0.39), Manure storage method (0.39), Animal welfare (0.43) and Degree of irrigation (0.49). Farm managers and the government need to adopt adequate relevant measures so as to improve the aspectual and the overall sustainability of this type of farms.

At the same time, farms registered as Physical entities have comparatively high positive values ranging within the limits of good sustainability level for some of the environmental sustainability indicators, such as Nitrates and pesticides concentration in groundwater, Degree of air pollution and Degree of Implementation of good agricultural practices. These advantages of Physical entities need to be maintained and improved, whereas the values of the other eco-efficiency indicators need to be raised so as to maintain and improve the aspectual and overall sustainability of this type of farms.



*Figure 5. Sustainability indicators of farms of different legal status  
Source: A survey conducted among farm managers, July 2016.*

Sole proprietors have low values in the sphere of managerial sustainability in terms of their Level of adaptability to the natural environment (0.37) and the Comparative efficiency of short-term assets supply and management (0.33). Furthermore, their social sustainability is low in terms of their Contribution to rural community conservation and their Contribution to the conservation of traditions (0.33 for each of the indicators) (Figure 5). At the same time, Sole proprietors have high sustainability values for the environmental aspects of their activity in terms of complying with the requirements on Manure storage, Nitrogen fertilizer rate and the Level of implementing good agricultural practices, and the value of efficiently applying the Crop rotation indicator is close to the values indicating a high level of sustainability. Sole proprietor farms which specialize in animal breeding have high sustainability in terms of Animal productivity and close to the top values (in the range of good level of sustainability) in terms of Animal welfare. In addition, many of the environmental sustainability indicators of Sole proprietors have high positive values within the range of the good sustainability level. Those include



Nitrates and pesticides concentration in surface water, Nitrates and pesticides concentration in groundwater, Degree of air pollution, Number of crops, Organic contents of soil, Degree of wind and water erosion and compliance with the Potassium and phosphorus fertilizer rates.

Sole proprietors also have high values in the range of good sustainability in terms of their Comparative efficiency of long-term assets supply and management, Labour productivity and Land productivity, which contributes to raising their managerial and economic sustainability.

Cooperatives have the highest values for managerial and socio-economic sustainability indicators (within the range of the good level) in terms of their Adaptability to market conditions, Labour productivity, Income per member of the farm household, and Contribution to the conservation of the rural community and traditions (Figure 5). Cooperatives also have high values for many of the environmental sustainability indicators (revealing high environmental sustainability), such as Nitrates concentration in ground water and good sustainability indicators for Nitrates and pesticides concentration in surface water, Pesticides concentration in groundwater, Number of crops, Level of implementing good agricultural practices, efficient Crop rotation and compliance with the Potassium and phosphorus fertilizer rates. These positive aspects of the farming activity of Cooperatives need to be maintained and expanded.

Cooperatives, on the other hand, are environmentally unsustainable in terms of the Degree of irrigation (0.2) and have low levels of sustainability in terms of their Comparative efficiency of supply and management of short-term assets (0.3), Animal productivity (0.33), the Number of animals per unit area allowed (0.31), Manure storage method (0.31), compliance with the principles of Animal welfare (0.41) and Degree of water erosion (0.43). These aspects in the activity of Cooperatives need to be substantially improved so as to raise their managerial, economic, environmental and integral sustainability.

The farms registered as Companies and other partnerships have the highest values (within the range of good sustainability) for the managerial sustainability indicators of Comparative efficiency of labour resources supply and management and Comparative efficiency of managing the sales of the agricultural produce (Figure 5). As for their economic sustainability, the indicators with the highest values are the Labour productivity and the Profitability of the farm. In terms of social sustainability, Companies and the other types of partnerships have the highest value for Compliance with legal requirements on working conditions. In terms of their environmental sustainability, this type of farms have the highest values for the indicators of Nitrates and pesticides concentration in groundwater and surface water, Degree of air pollution, Level of implementing good agricultural practices, efficient Crop rotation, Number of crops, compliance with the Rates for nitrogen and phosphorus fertilizers and the Degree of conservation of eco systems.

Companies and other partnerships have the lowest values for the managerial and economic sustainability indicators of Comparative efficiency of short-term assets supply and management (0.35), Animal productivity (0.35), and the environmental indicators of Number of animals allowed per unit area (0.29), Manure storage method (0.35), Compliance with the requirements on animal welfare (0.41), Degree of irrigation (0.41) and Number of wild species on the territory of the farm (0.49). Those aspects of

their performance need to be improved, so that their managerial, economic, environmental and integral sustainability would be raised.

### Analysis of the sustainability of management structures in agriculture

The greatest number of Bulgarian farms have been registered as Physical entities (three-quarters of all respondents are managers of such farms), so they largely (pre)determine the 'average' sustainability of the farms in the country. Therefore, there are only slight deviations in the level of the overall sustainability of Physical entities from the average levels of sustainability of the major types of farms in the country (Figure 6).

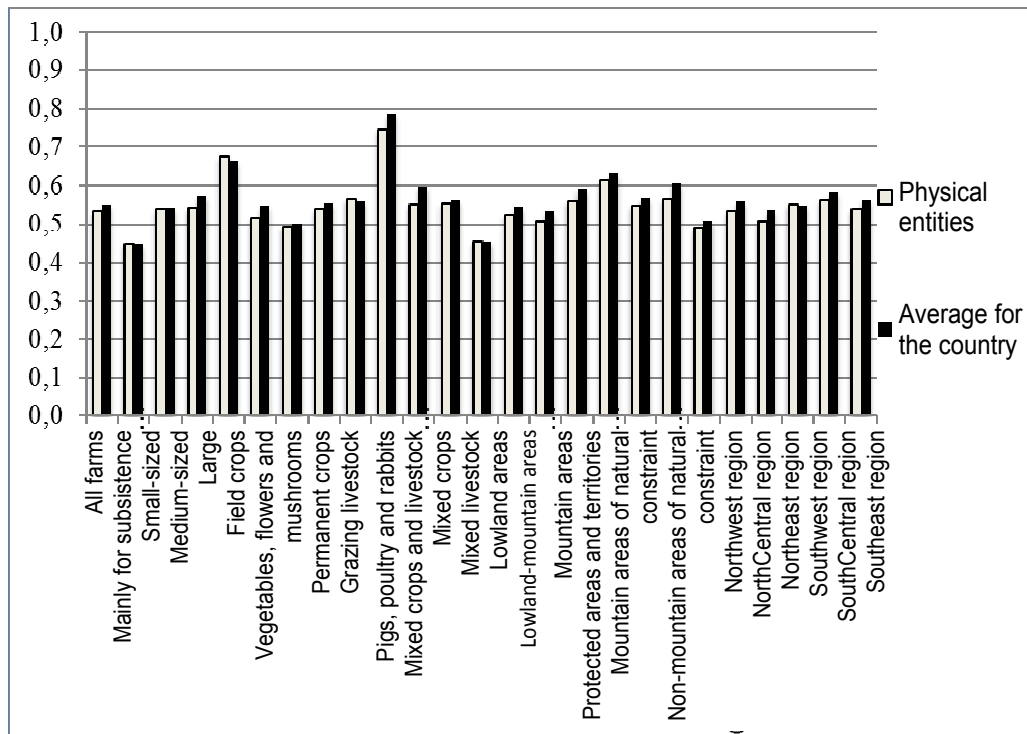


Figure 6. Sustainability levels of the agricultural holdings registered as Physical entities of different types

Source: A survey conducted among farm managers, July 2016.

The sustainability of Physical entities varies widely depending on their size, specialization, environmental and geographical location. This indicates that the size of this type of agricultural holdings, the production they specialize in, and their location are more significant to their sustainability than their legal status is.

The higher sustainability, within the range of the good level, is that of the Physical entities of Large size; those specializing in Pigs, poultry and rabbits; those

having land in Protected areas and territories and those located in the South Central region. At the same time, Physical entities which are Mainly for Subsistence; specializing in Mixed livestock and in Vegetables, flowers and mushrooms, and those located in the region Northwest, have low sustainability. Depending on their environmental location, the lowest values of sustainability, within the range of the good level, are those of the Physical entities in Lowland-mountain areas of the country.

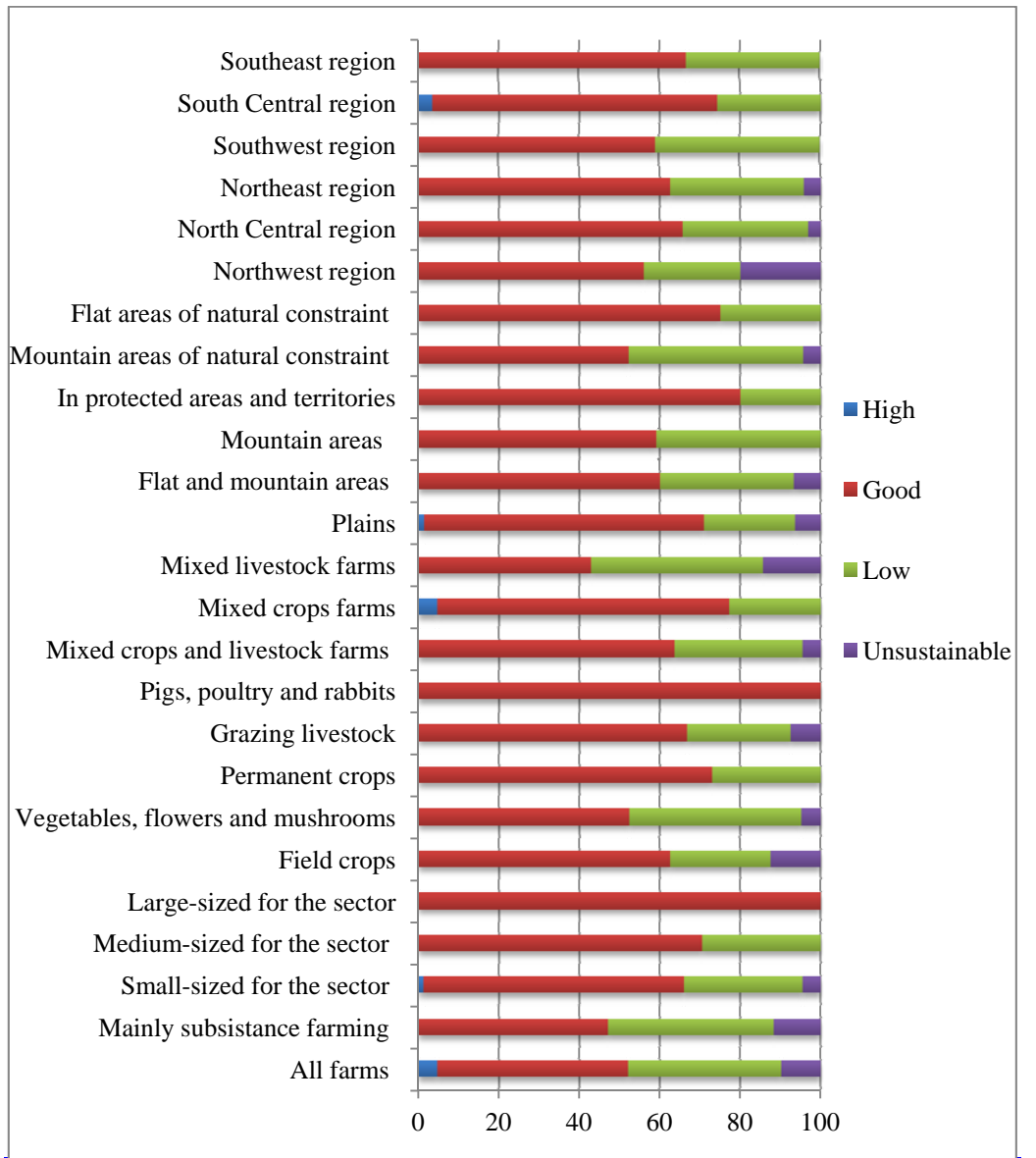


Figure 7. Share of the different types of Physical entities with different levels of sustainability (as a percentage)

Source: A survey conducted among farm managers, July 2016.

There is also a substantial differentiation in the share of entities with a different level of sustainability within the major types of Physical entities (Figure 7). The sustainability of all Physical entities of Large size and those specializing in Pigs, poultry and rabbits; the majority of those specializing in Mixed crops and Permanent crops; those located in Lowland areas of natural constraint and with Land in protected areas and territories is good (and, in some cases, even high). On the other hand, the majority of Physical entities which are Mainly for Subsistence and those specializing in Mixed livestock have low sustainability or are unsustainable. There is a substantial number of lowly sustainable or unsustainable Physical entities specializing in Vegetables, flowers and mushrooms, grazing livestock, mixed crops and livestock, located in Mountain areas of natural constraint, in Lowland-mountain areas, and in the Northwest and Southwest regions.

The sustainability level of farms registered as Sole proprietors also varies depending on their size, specialization, environmental and geographical location. The highest sustainability is that of Sole proprietors of Large size; specializing in Vegetables, flowers and mushrooms; located in Lowland areas and in the South Central region (Figure 8). At the same time, the sustainability level of Sole proprietors specializing in Mixed crops and in Grazing livestock is low and the value of Small-sized farms and farms located in Lowland-mountain areas and in the Northwest region are close to those indicating low sustainability.

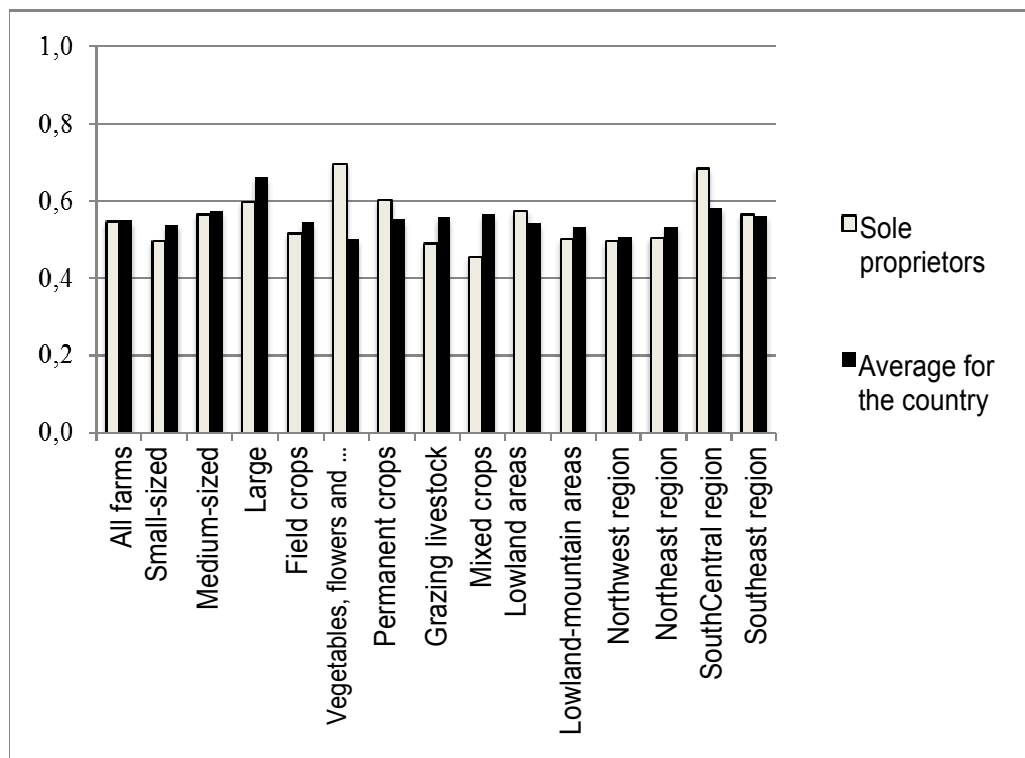


Figure 8. Sustainability level of the different types of farms registered as Sole proprietors

Source: A survey conducted among farm managers, July 2016.

Within the groups of Sole proprietors with the lowest and the highest levels of sustainability, there are also considerable deviations from the average sustainability levels for those groups. This suggests that the specific legal status of a Sole proprietor is a significant (and more powerful) factor determining the sustainability level within the group, than the type of agricultural holdings which the farm belongs to. On the other hand, with the other types of Sole proprietors, the sustainability levels are close to the average for the country, which indicates that for those types of agricultural holdings, the size, the specialization of production, and the location are the major factors affecting their sustainability levels.

There are also significant variations in the share of Sole proprietors of different types with different levels of sustainability (Figure 9). The sustainability of all Large farms, those specializing in Field crops, Vegetables, flowers and mushrooms, and Permanent crops, and the farms located in the Northeast and South Central regions, is good. At the same time, the sustainability of all Mixed crops farms, one in two farms specializing in Grazing livestock, and one in three of the Small and Medium-sized farms, as well as those located in the Northwest and Southeast regions, is low.

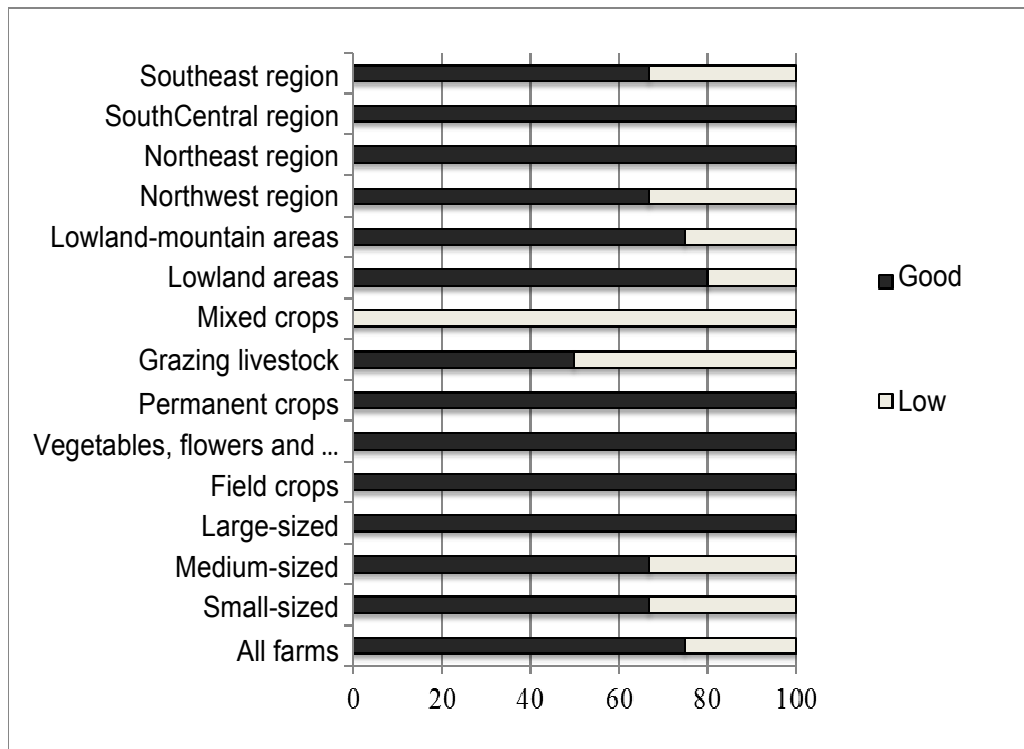


Figure 9. Share of the different types of Sole Proprietors with different levels of sustainability

Source: A survey conducted among farm managers, July 2016.

The sustainability level of cooperatives differs significantly according to the size, specialization and location of the farms. The highest values (approximating the values

for high sustainability) are those of Large cooperatives, cooperatives specializing in Pigs, poultry and rabbits, and those situated in Mountain regions, in Mountain areas of natural constraint and in the North Central region (Figure 10).

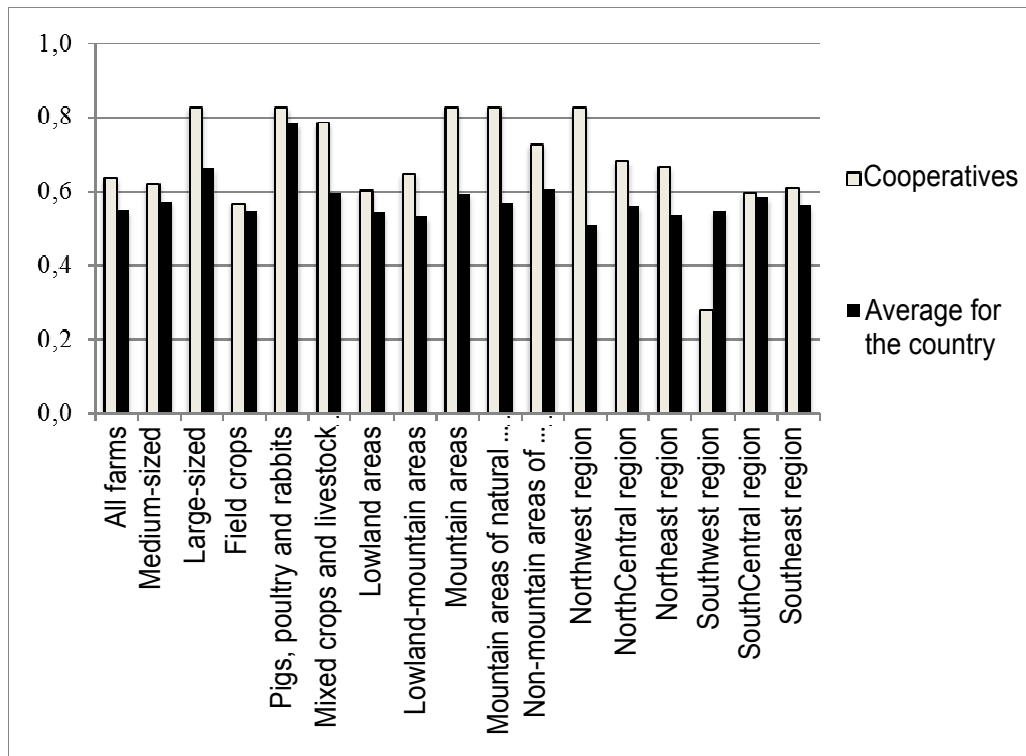


Figure 10. Sustainability levels of the different types of Cooperatives  
 Source: A survey conducted among farm managers, July 2016.

The cooperatives with the lowest sustainability are located in the Southwest region. The sustainability levels of most Cooperatives of different types deviate significantly from the average sustainability levels for the same groups of farms in the country. This implies that the specific nature of Cooperatives (i.e. the legal status of these entities) is a powerful factor, which affects the sustainability level of the farms of a specific type, more so than is their belonging to a specific category of farms in the country.

There are some major differences in the share of cooperatives with different sustainability levels among the individual types of farms (Figure 11). The sustainability of all Large Cooperatives, as well as the cooperatives specializing in Pigs, poultry and rabbits; in Mixed crops and vegetables and those located in Mountain areas, in Mountain and Non-mountain areas of natural constraint, and in the Northwest, North Central, South Central and Southeast regions, is good. The largest share of highly sustainable cooperatives is that of the farms in the Northeast region and in the Lowland areas of the country, as well as those specializing in Field crops. In contrast, the sustainability of all cooperatives in the region Southwest and 40% of those in the Lowland-mountain areas of the country is low.

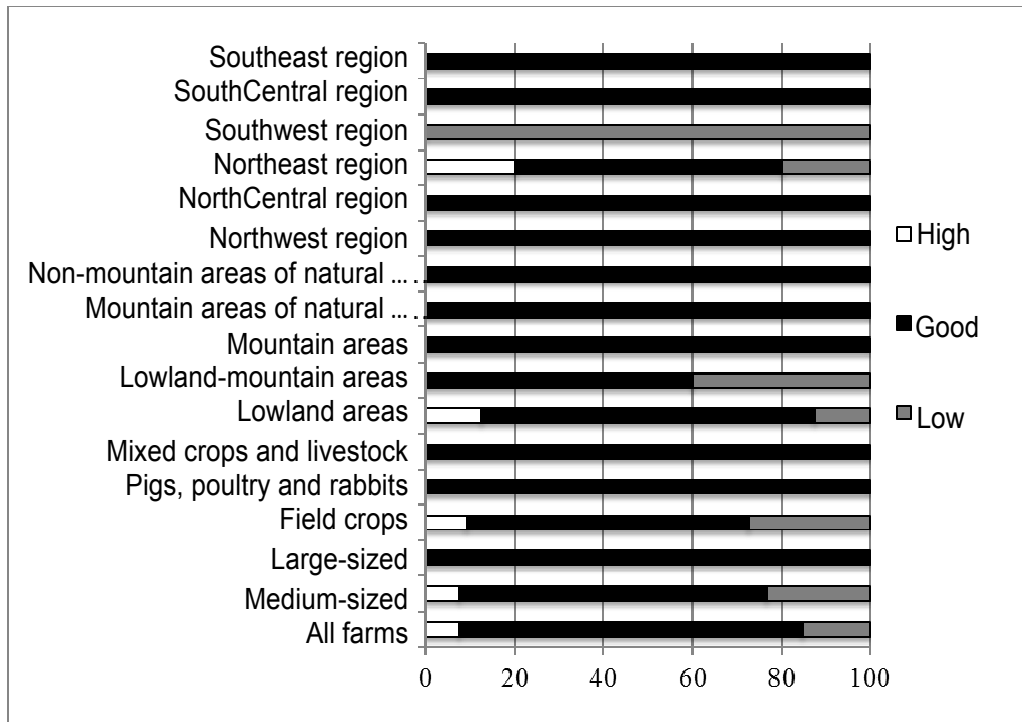


Figure 11. Share of the Cooperatives of different types with different levels of sustainability (as a percentage)

Source: A survey conducted among farm managers, July 2016.

It is easy to note that the sustainability of Companies and other partnerships varies substantially according to their size, specialization and geographical location (Figure 12). The highest sustainability is that of Small-sized Companies and other partnerships; those specializing in Permanent crops, and those in Mountain areas and in the Southeast region. In contrast, the sustainability of legal entities of this type which specialize in Grazing livestock or are located in the region Northwest is lower.

The sustainability level of all farms which have been registered as Companies and other partnerships is high, except for the Large farms, the farms specializing in Grazing livestock, and the farms which are in the region Northeast. This indicates that the specific legal status of most categories of Companies and other partnerships largely determines their sustainability level. The three groups we have listed above are the only exception, as in their case, it is their size, specialization of production, and geographical location that determines their sustainability.

The share of farms with different sustainability levels in each group differs a lot for Companies and other partnerships, too (Figure 13). All farms specializing in Mixed (crops and livestock) and those located in Mountain areas of natural constraint, as well as most of the Large farms and the farms specializing in Mixed crops are highly sustainable. In contrast, the sustainability of half of the Companies and other partnerships in the Northwest region and one in every three farms of this legal status in the Southeast region is low.

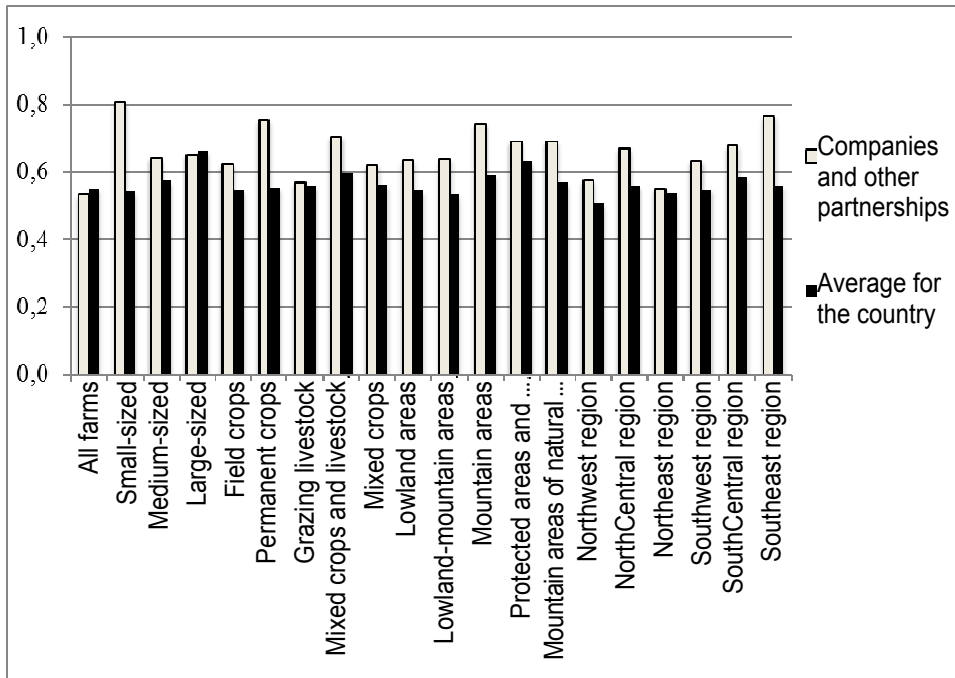


Figure 12. Sustainability levels of Companies and other partnerships of different types  
Source: A survey conducted among farm managers, July 2016.

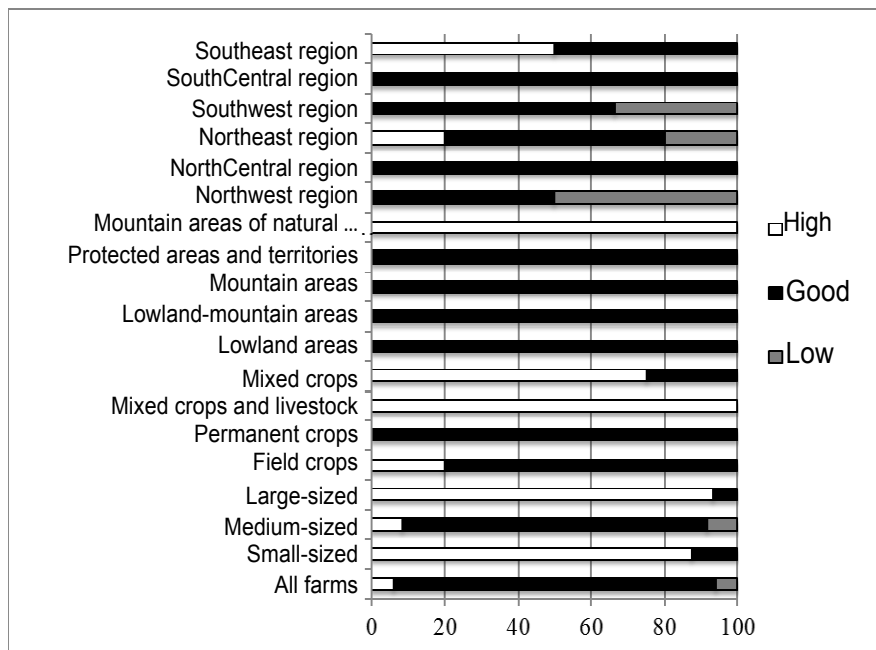


Figure 13. Share of the Companies and other types of partnerships of different types with different level of sustainability (as a percentage)  
Source: A survey conducted among farm managers, July 2016.



## Sustainability factors of management structures

A variety of social, economic, market, ideological, personal, etc. factors enhance or reduce the capacity of farms to perform and develop sustainably.

According to the farm managers who were interviewed, the drivers with the most powerful impact on the activities for raising the managerial sustainability of their farms are: Access to farm consultancy; Professional training of managers and hired workers; Personal motivation and satisfaction; Positive experience of other farms; the Information available; Financial opportunities; Private contracts and agreements; Registration and certification of products and services, etc. (Figure 14). At the same time, other factors, such as Direct benefits to other individuals and groups; Community and region initiative and pressure; Problems and risks existing within the region; Problems existing globally and Problems and risks existing in the country were found to exercise a major impact on raising the managerial sustainability of a smaller number of farms.

The most powerful drivers encouraging the activity of the majority of farms to raise their economic sustainability are: Market demand and prices; Direct government subsidies received; Market competition; Financial opportunities; Involvement in government support programmes; Potential current benefits; Potential benefits in a near future; Tax incentives; Potential benefits in a further future and Integration with the buyers of the farm produce (Figure 15). In contrast, Initiatives and pressure of the community in the region; Public recognition of farms' contribution; Interest groups initiatives and pressure; Direct benefits to other individuals and groups and Professional training of managers and hired workers were reported to be essential to only a small number of farms.

As for the factors encouraging the activities of farms to raise their social sustainability, the most powerful drivers were reported to be Personal motivation and satisfaction; Public recognition of their contribution; Direct benefits to other individuals and groups; Initiatives and pressure of the community in the region; Access to farm consultancy; EU policies and the Problems and risks existing in the region (Figure 15). Only a small number of farm managers identified Government control and sanctions; Long-term contracts with the government; Registration and certification of products and services; Tax incentives or Integration with farm suppliers as factors contributing to their social sustainability.

According to the findings of our survey, the most powerful drivers of the environmental sustainability of farms are: Problems and risks existing globally; Legal documents, standards and norms; Problems and risks existing in the region; EU policies (Figure 16). The least significant factors to the environmental sustainability of farms were reported to be Integration with farm suppliers; Tax incentives; Long-term contracts with the government; Market demand and prices; Integration with buyers of the farm produce; Market competition; Interest groups initiatives and pressure; Partners available for cooperation; Initiatives of other farms and Potential current benefits.

All these specific factors need to be accounted for when designing and improving public sustainable development policies and programmes as they promote the activity of farms in general and, to a varying degree, the activity of the different types of farms in Bulgaria.

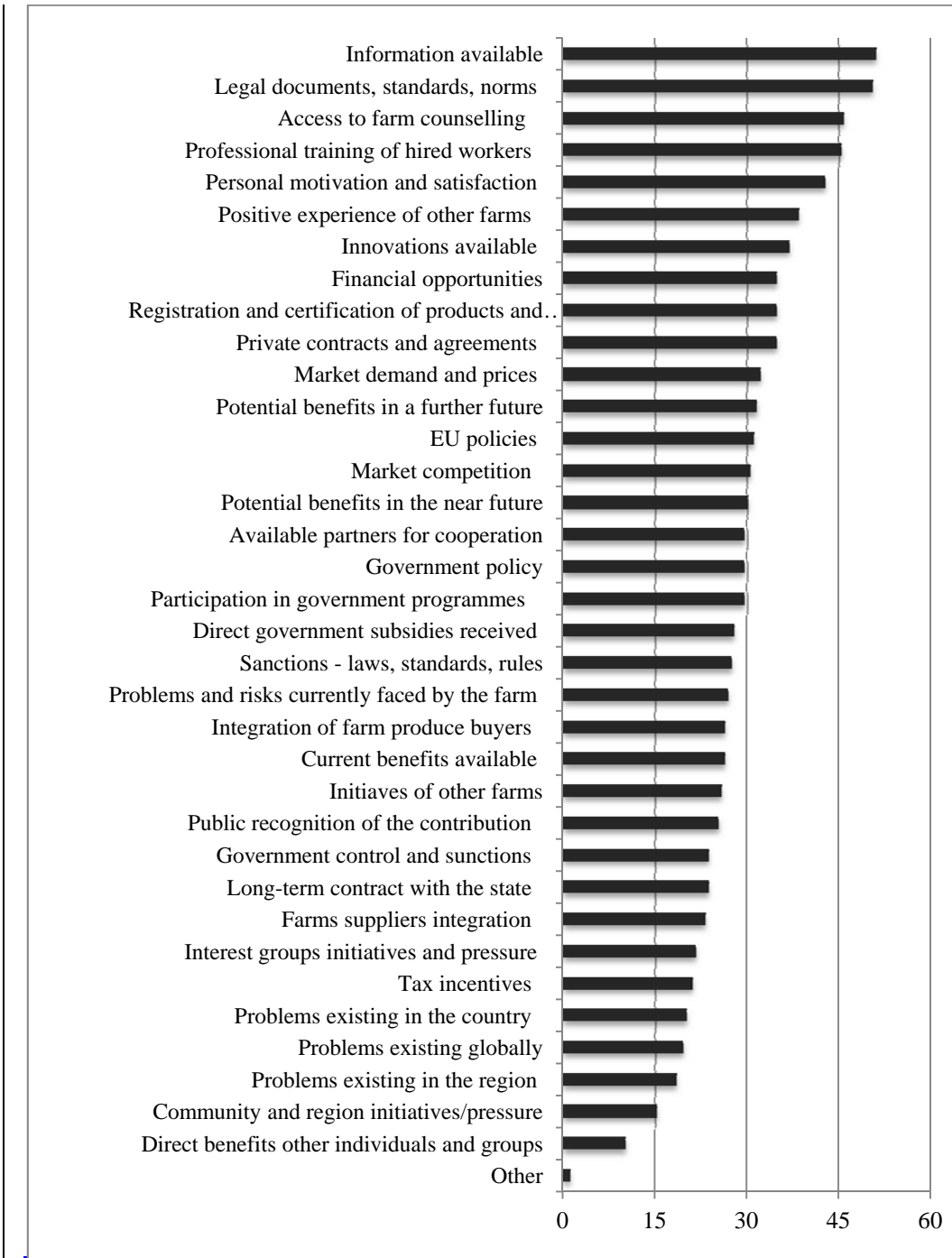


Figure 14. Most powerful drivers encouraging activities to increase the managerial sustainability of farms (as a percentage)

Source: A survey conducted among farm managers, July 2016.

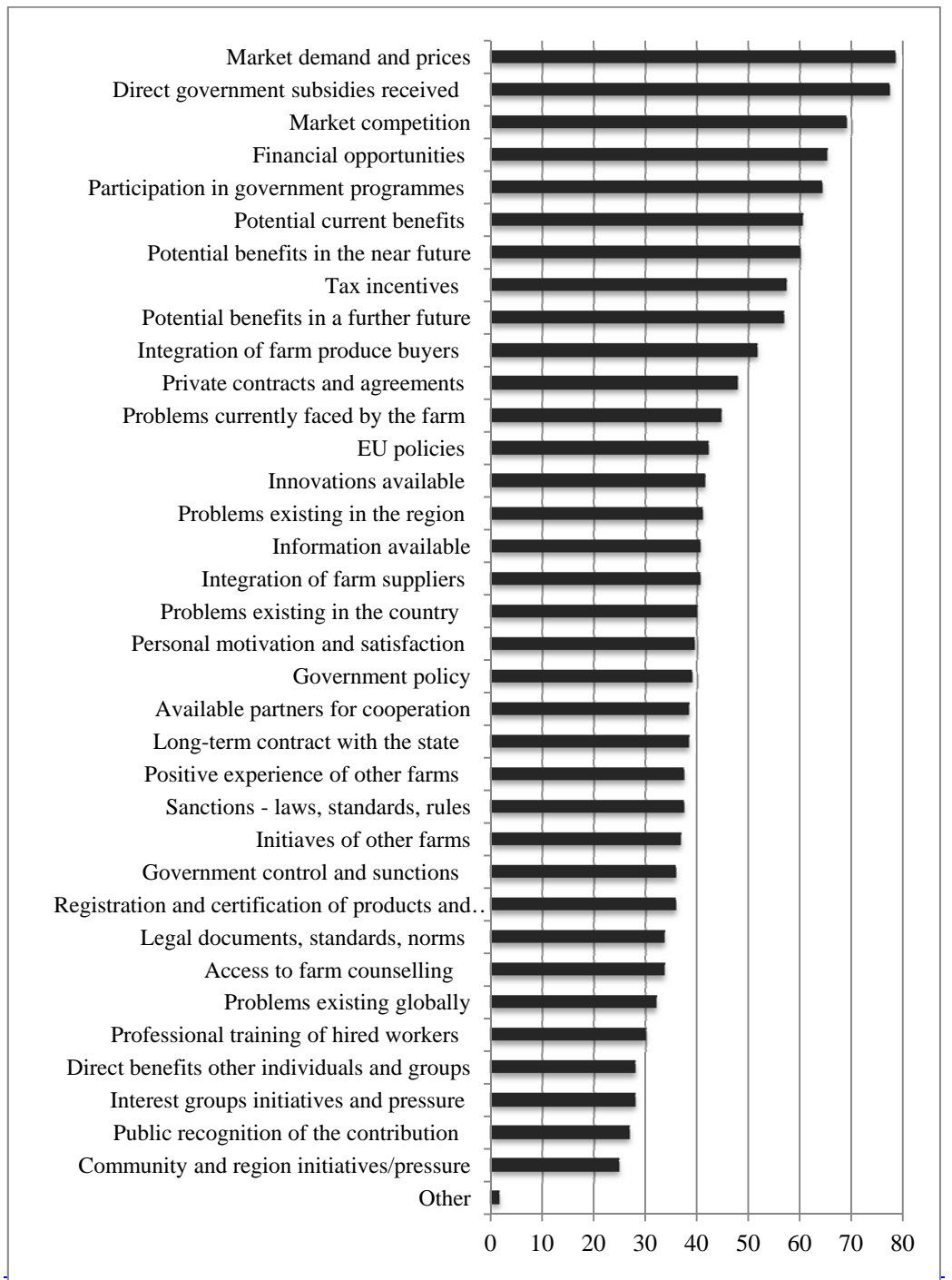


Figure 15. Most powerful drivers encouraging activities to increase the economic sustainability of farms (as a percentage)

Source: A survey conducted among farm managers, July 2016.

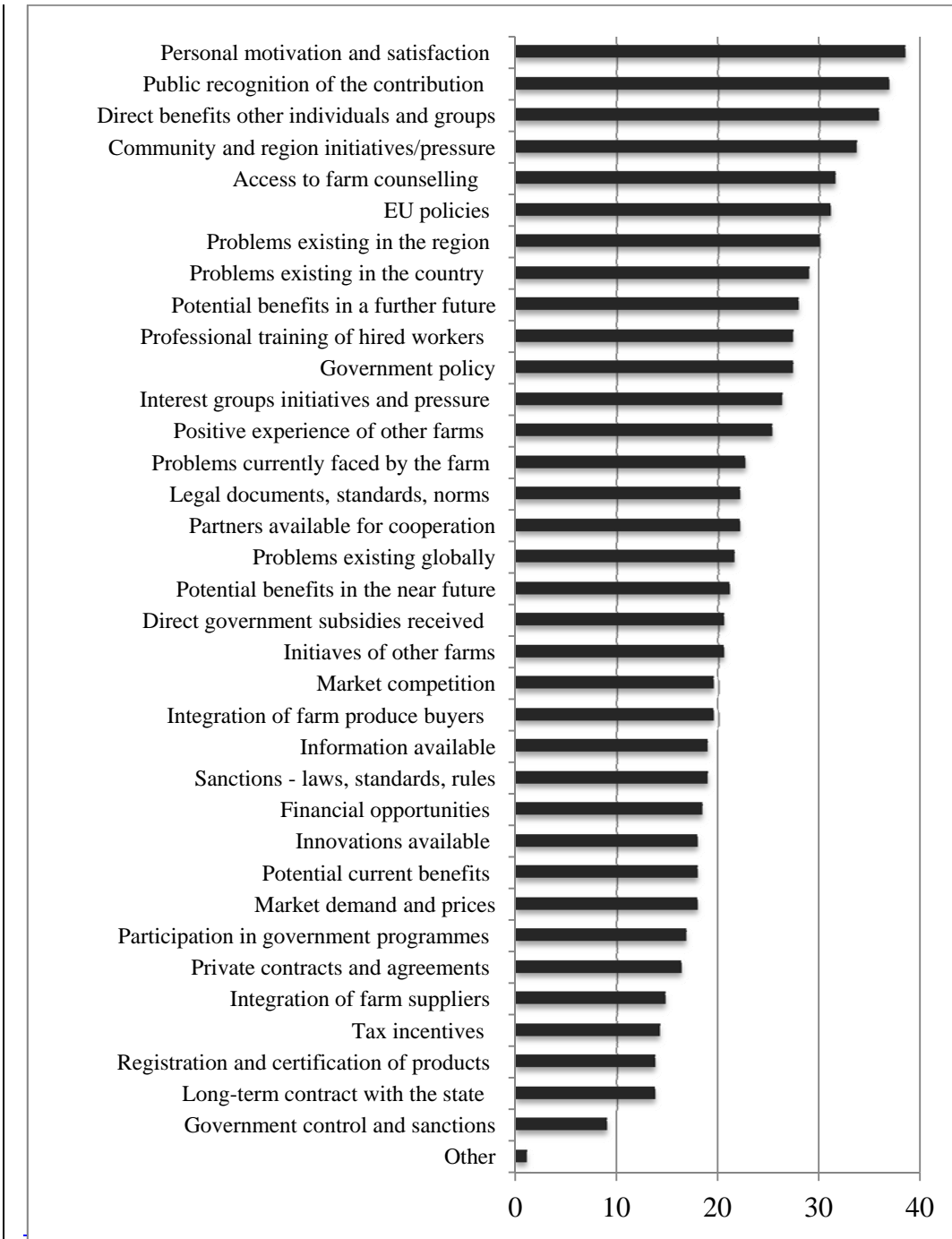


Figure 15. Most powerful drivers encouraging activities to increase the social sustainability of farms (as a percentage)

Source: A survey conducted among farm managers, July 2016.

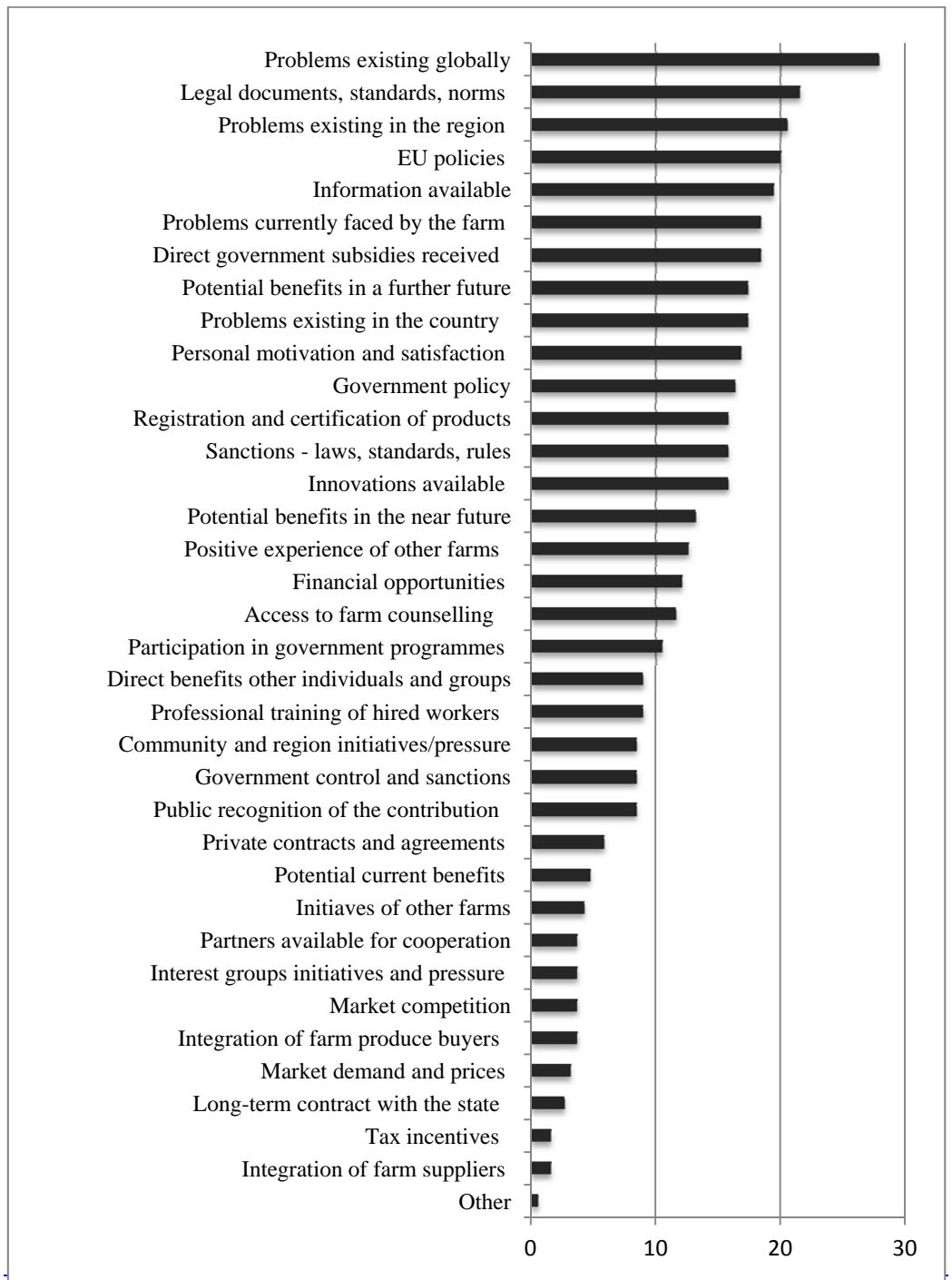


Figure 16. Most powerful drivers encouraging activities to increase the environmental sustainability of farms (as a percentage)  
 Source: A survey conducted among farm managers, July 2016.

The support provided through various mechanisms of the government and the EU Common Agricultural Policy aims to improve the multiple aspects of the sustainability of farms in the country.

Public policies tend to have a less significant impact on the managerial sustainability of Bulgarian farms.

The regulatory and support mechanisms of the government and the EU which were reported to have a major impact on the managerial sustainability of Bulgarian farms are: Professional training and consultancy; Mandatory standards, norms, rules and restrictions; Modernisation of agricultural holdings and Establishing producer organizations (Figure 63).

On the other hand, the factors which were identified to have an impact on the smallest number of farms are: Reforestation and rehabilitation of the forest potential; Payments to lowland areas of natural constraint; Natura 2000 payments and Village Renewal and development. The various mechanisms for providing public support proved to be most efficient to increasing the economic sustainability of Bulgarian farms.

The largest number of respondents identified as the most powerful drivers of the economic sustainability of their farms Direct subsidies per unit of area; National co-financing for products, animals, etc.; Modernisation of agricultural holdings; Green payments and Support to semi-subsistent farms (Figure 17).

The impact exercised on the social and environmental sustainability of Bulgarian farms through government and European policies is relatively weak. Some instruments which help raise the social sustainability of a large number of farms are Local development strategies; Services provided to the population of rural areas; Village Renewal and development and Encouragement of tourism activities.

The most powerful drivers of the environmental sustainability of farms are Green payments; Government support for organic farming; Mandatory standards, norms, rules and restrictions and Agro-environment payments.

The effect of the individual policy instruments upon the sustainability of farms differs both in terms of the different types of farms and in terms of their geographical location. The most powerful mechanisms and instruments of national and European policies were identified to be: Mandatory standards, norms, rules and restrictions in terms of the managerial sustainability of Large farms and in terms of the environmental sustainability of farms specializing in Pigs, poultry and rabbits; Direct subsidies per unit of area – to the economic sustainability of Sole proprietors; Cooperatives; Companies and other partnerships; Small-sized farms; farms specializing in Pigs, poultry and rabbits; farms specializing in Mixed crops farming; farms specializing in Field crops, as well as farms located in lowland areas of natural constraint; farms whose land is in Protected areas and territories; in mostly Mountain areas of the country; in Mountain areas of natural constraint; in the Southwest and South Central regions. National co-financing for products, animals, etc. was identified as essential to the economic sustainability of Companies and other partnerships; farms specializing in mainly Subsistence farming and farms specializing in Grazing livestock. In terms of their geographical location, National co-financing for products, animals, etc. was reported to be an instrument promoting the economic sustainability of farms located in mainly Mountain areas and farms with land in Protected Areas and territories, as well as those

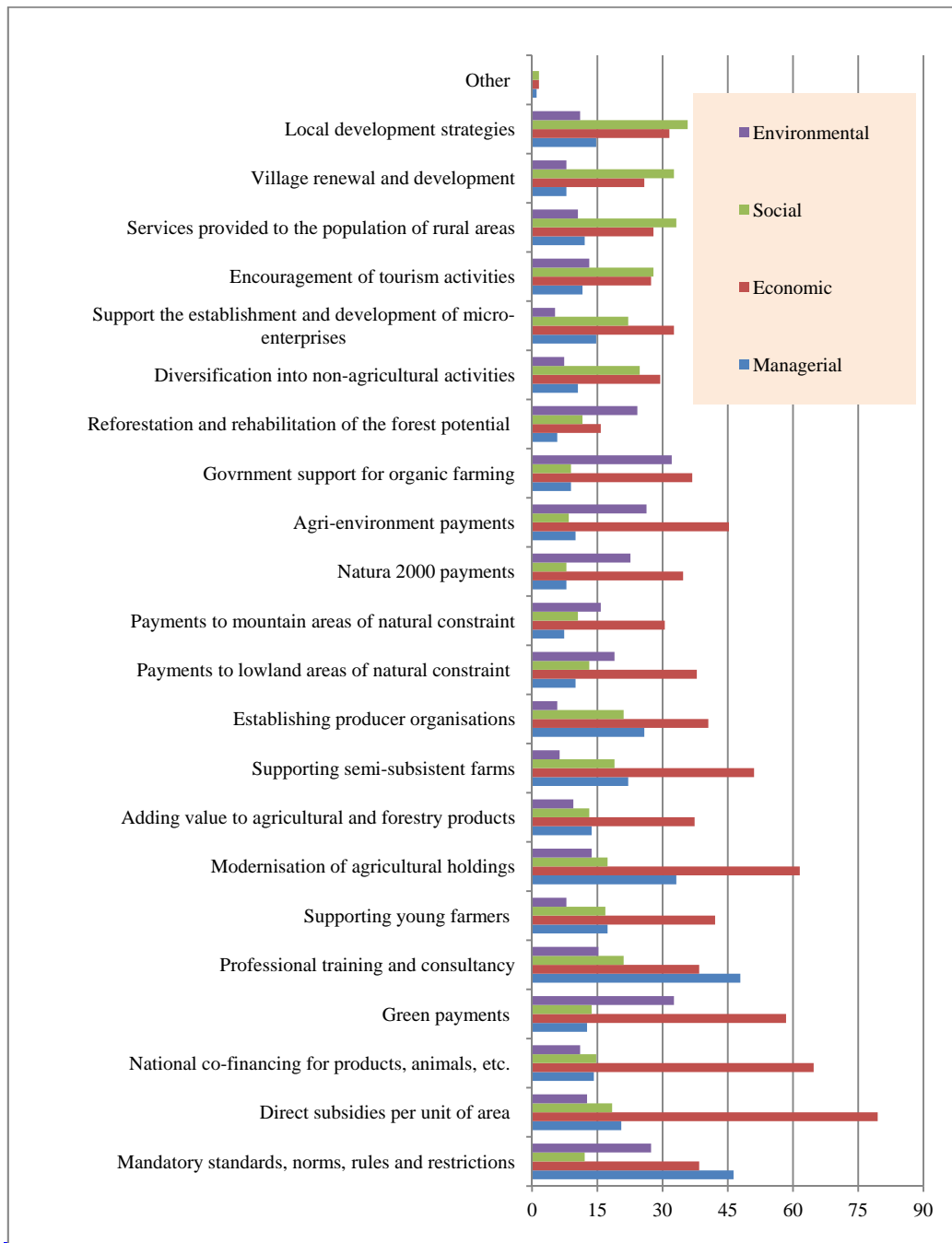


Figure 17. Policy instruments with the most powerful impact on the sustainability of farms (as a percentage)  
 Source: A survey conducted among farm managers, July 2016.

in the North Central and Southwest regions. Green payments were reported to promote the economic sustainability of farms in Mountain areas; farms with land in protected areas and territories and farms in the Southwest region. The instrument contributing to the economic sustainability of Large farms is Professional training and consultancy, while Modernisation of agricultural holdings contributes to the economic sustainability of Sole proprietors, Companies and other partnerships; farms specializing in mixed livestock; farms specialising in mixed crops, farms in Mountain areas, and in the North Central and South Central regions. Supporting semi-subsistent farms and Establishing producer organizations are the policy instruments contributing to the economic sustainability of Subsistence farms, while Payments to mountain areas of natural constraint affect the economic sustainability of the farms located in such areas.

The data provided by the findings of our research about the real impact which the individual mechanisms and instruments for public support have upon the different aspects of sustainability of Bulgarian farms should be taken into consideration when streamlining the policies and programmes for supporting the agricultural sector and the farms of different type and location.

## **Conclusion**

The survey we have conducted comprises 'typical' and, to some degree, sustainable (viable) agricultural structures, which means that the sustainability level of our samples is above the real (average) level of the sustainability of Bulgarian farms. Nevertheless, this was the first large-scale research of the sustainability of management structures in Bulgarian agriculture and it enabled us to arrive at some major conclusions about the level of economic sustainability and to make some recommendations for improving the management and assessment practice. The holistic approach we employed made it possible to assess, analyse and improve the sustainability level of individual farms and of different types of farms in general and by major aspects, principles, criteria and indicators of managerial, economic, social and environmental sustainability. This approach needs to be thoroughly discussed, tested, improved and adapted to the specific environment in which farms of a given type, subsector, geographical region and eco system operate and develop, as well as to the specific demands of decision-makers at various hierarchical levels.

The overall sustainability of Bulgarian farms is good, the levels of the environmental and social sustainability being the highest, and those of the managerial and economic sustainability approximating the low level of sustainability. The sustainability levels of farms of different legal structure vary widely, and so does the share of farms with different levels of sustainability. The layers thus formed by farms of different types into groups with different level of sustainability must be taken into account when predicting the number and significance of the farms of each type and location, as well as when improving the public policies for supporting the agricultural producers of a specific type, subsector, eco-system and region in the country.



Such comprehensive valuations of the sustainability of farms are highly relevant and extremely useful to the management of farms and the design of agricultural policies and should therefore be expanded, while aiming to increase their accuracy and representativeness. This would require a closer cooperation among all stakeholders, as well as the involvement of farmers, agrarian organisations, local and central government bodies, interest groups, scientific research institutes and experts, etc. At the same time, it is also necessary to improve the accuracy of evaluations which should be based not only on farmers' judgement, but also on adequate further information acquired through field studies and tests, statistical and other types of data and expertise provided by specialists in the area.

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