

## Study on Eco-management in Farming Enterprises in Bulgaria

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### Abstract

This paper presents the results of a first large-scale study on forms, factors, and efficiency of eco-management in farming enterprises of different type (individual and family farms, agri-firms, agro-corporations, agro-cooperatives etc.) in Bulgaria. First, a brief characterization of surveyed "eco-active" farming enterprises is made. After that, diverse (internal, private, contract, market, formal, informal, hybrid etc.) forms and the scope of eco-management in farming enterprises are analyzed. Next, different (ideological, economic, market, social etc.) factors of eco-management in farming enterprises are specified. After that, analysis is made on costs, effects, efficiency and perspectives of eco-management in farming enterprises. Finally, conclusions from the study are summarized.

**Keywords:** Environmental management; Agri-business; Farming enterprises; Forms; Factors; Efficiency; Bulgaria

**JEL Classification:** Q12, Q18, Q20, Q30

### Introduction

The issue of environmental management in farming enterprises of different type and locations is among the most topical at the current stage of development around the globe [1-15]. With few exceptions with the analysis of the evolution of agro-eco governance [2,16-18], organic agriculture [19] and eco-culture of farms [20] there are no large scale studies on forms, factors and efficiency of the eco-management in farming enterprises with different type in Bulgaria.

This paper presents the results of a large-scale study on forms, factors and efficiency of the eco-management in "eco-active" farming enterprises of different type and location in Bulgaria. It is based on a survey with the agricultural producers carried out during the training by the National Agricultural Advisory Service on Measure 214 "Agri-environmental payments" of the National Program for Agrarian and Rural Development (NPARD). The training is free of charge and mandatory for all beneficiaries from the Measure 214. Therefore, the interested agents had strong incentives and low costs (time for traveling and training, etc.) for participating in the specialized training.

This first large-scale survey in the country gives a good insight for the "eco-active" farming enterprises and for the type of eco-management they apply. We define as "eco-active" these enterprises, which are interested in the environmental measures of the NPARD and in the protection of natural environment. For the classification of farming enterprises according to the juridical type, specialization, and geographical and program (e.g. less-favored mountainous regions, less-favored region different from mountainous, lands in protected zones and territories) locations the official typology in the country is used. Each of the surveyed enterprises self-determined itself as predominately for subsistence, rather small, middle size or large for the industry, and located mainly in plain, plain-mountainous or mountainous region. This approach is applied since the farm managers know the best their specificity and comparative characteristics in relations with other farming enterprises in the region and (sub)sector. In the survey 306 registered agricultural producers have taken part, which accounts for 4.52% of all farms in the country registered according to the Regulation № 3, 1999 for the creation and maintaining register of agricultural producers.

First, a brief characteristic of the surveyed "eco-active" farming enterprises is made. After that, the forms and the scope of eco-

management in farming enterprises are analyzed. Next, the factors of co-management are identified. After that, the efficiency and perspectives of eco-management in farming enterprises is evaluated. Finally, the conclusions and recommendations are summarized.

### Characteristics of Surveyed "Eco-Active" Farming Enterprises

Farming enterprises of all juridical types, sizes, specialization and location are surveyed (Table 1). The majority of the participants are Physical Persons, farms with small and middle sizes for the industry, specialized in field and permanent crops, and located predominately in plain and plain-mountainous regions. A fifth of the participants did not indicate the region (municipalities) where the farms are located.

The most of the surveyed Physical Persons are self-determined as "small" (49%) and "middle size" (30,9%) for the sector, a portion is predominately for self-subsistence (15,1%), and a tiny segment is with "big size for the industry" (1,9%). The main part of the Physical Persons is specialized in permanent crops (34,7%), field crops (17,4%), mix crop-livestock production (14,3%), vegetables and mushrooms (11,2%), mix livestock production (10,8%), and mix crop production (7,7%), while a small portion is in grazing livestock (1,9%), beekeeping (1,5%), and pigs, poultry and rabbits (0,8%).

The Physical Persons are predominately located in plain (59,8%) and plain-mountainous (25,5%) regions, and a petite share is in mountainous regions (8,9%), with lands in protected zones and territories (5,4%), in less-favored mountainous regions (6,9%) and in less-favored regions different from mountainous (3,5%). A relatively greater portion of the surveyed Physical Persons are with unspecified region (23,9%), or situated in the North-Central (18,1%), North-Eastern (15,4%), and South-Central (13,9%) regions of the country, while participants from the North-Western, South-Western and South-Eastern regions are fewer – accordingly 7,3%, 9,3% and 12%.

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Indicators	Physical Persons	Sole Traders	Cooperatives	Companies, Corporations, etc.	Number, % in total
Share in total number	84,64	7,19	2,61	5,55	306*
Field crops Cooperatives	17,37	50,00	75,00	52,94	23,53
Vegetables and mushrooms	11,20	0	0	0	9,48
Permanent crops	34,75	31,82	0	5,88	32,03
Grazing livestock	1,93	9,09	0	5,88	2,61
Pigs, poulties and rabbits	0,77	4,55	0	0	0,98
Mix crops	10,81	0	0	17,65	7,52
Mix livestock	14,29	0	0	5,88	9,48
Mix crop-livestock	1,54	4,55	25,00	5,88	13,40
Beekeeping		0	0	0	1,31
Mainly subsistence	15,06	4,55	0	0	13,07
Small for industry	49,03	31,82	0	11,76	44,44
Middle size	30,89	50,00	75,00	58,82	35,29
Big size for industry	1,93	13,64	25,00	17,65	4,25
Mainly plain	59,85	50,00	87,00	70,59	60,78
Plain-mountainous	25,48	27,27	12,50	23,53	25,16
Mainly mountainous	8,88	9,09	0	0	8,17
With lands in protected zones and territories	5,41	0	0	11,76	5,23
Less-favored mountainous regions	6,95	9,09	0	0	6,54
Less-favored regions different from mountainous	3,47	4,55	0	5,88	3,59
North-west region	7,33	4,54	0	11,76	7,52
North-central region	18,15	31,82	75,00	23,53	20,91
North-east region	15,44	9,09	0,25	29,41	16,01
South-west region	9,27	4,54	0	0	8,17
South-central region	13,90	0	0	5,88	12,42
South-east region	11,97	27,27	0	11,76	12,74
Unspecified region	23,94	22,73	0	5,88	22,22

Source: Survey with agricultural producers, 2014

**Table 1:** Characteristics of surveyed farming enterprises.

A half of the Sole Traders are with middle size, 31,8% are with small size, 13,6% are large, and 4,5% are self-determined as predominantly subsistent holdings. A half of this type of firm are specialized in field crops, 31,8% in permanent crops, 9,1% in grazing livestock, 4,5% in crop-livestock production, and the same share in pigs, poultry and rabbits.

A half of the Sole Traders is located mainly in plain regions, 27,3% are in plain-mountainous regions, and a smaller portion is in mountainous regions (9,1%), in less-favored mountainous regions (9,1%), and in less-favored regions different from mountainous (4,5%). The greatest share of this type of farms are in the North-Central (31,8%) and South-Eastern (27,3%) regions, a good part is with unspecified region (22,7%), and the rest are located in the North-Eastern (9,1%), North-Western (4,5%) and South-Western (4,5%) regions of the country.

In the group of the “Companies, corporations, etc.” there are mostly Corporations (82,3%) and the rest are equally distributed different types of (Limited Liability, etc.) Companies - by 5,6%. The biggest part of the Companies, Corporations, etc. self-determined themselves with middle for the industry sizes (58,8%), 17,6% are large farms, while 11,8% are with small size. Most of this type of farms are specialized in field crops (52,9%), while another significant portion is in mix crop production (17,6%), and a smaller share in (each 5,9%) permanent crops, grazing livestock, mix crop-livestock production, and mix livestock production.

The Companies, Corporations, etc. are situated explicitly in plain (70,6%) and plain-mountainous (23,5%) regions, as part of them are with lands in protected zones and territories (11,8%), and in less-

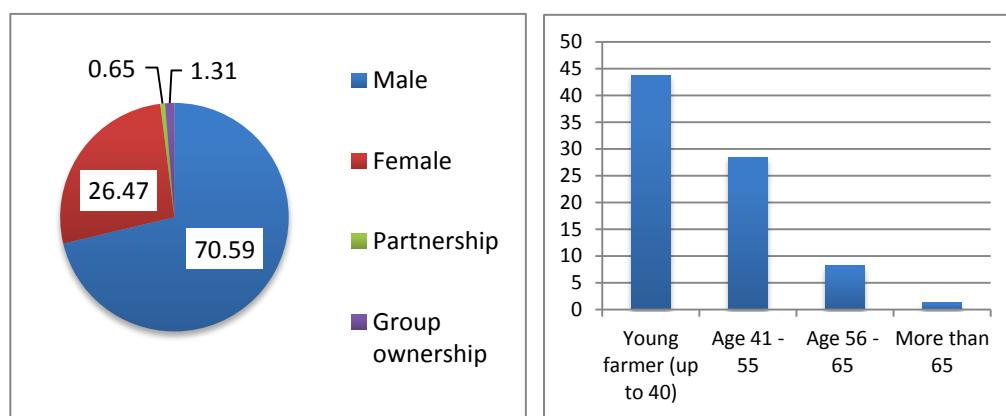
favored regions different from the mountainous (5,9%). The biggest part of this type of firms are located in the North-Eastern (29,4%), North-Central (23,5%), and North-Western (17,65) regions, in the South-Eastern and South-Central regions there are by 11,7% of them, while with unspecified regions are 5,9%.

The surveyed Cooperatives are with middle (75%) and big (25%) sizes for the industry. Three-quarters of them are specializing in field crops, and the rest in mix crop-livestock production. The cooperative farms are located inclusively in plain (87,5%) and plain-mountainous (12,5%) regions, and a three quartets of them are in the North-Central region, while the rest in the North-Eastern region of the country.

The structure of surveyed farms by juridical status, geographical locations, size, etc. approximately corresponds to the real structure of all (market-oriented, registered) farms in the country. Nevertheless, among the farms with high eco-activity there are relatively more farms specialized in the permanent crops in comparison with other directions of the production specialization.

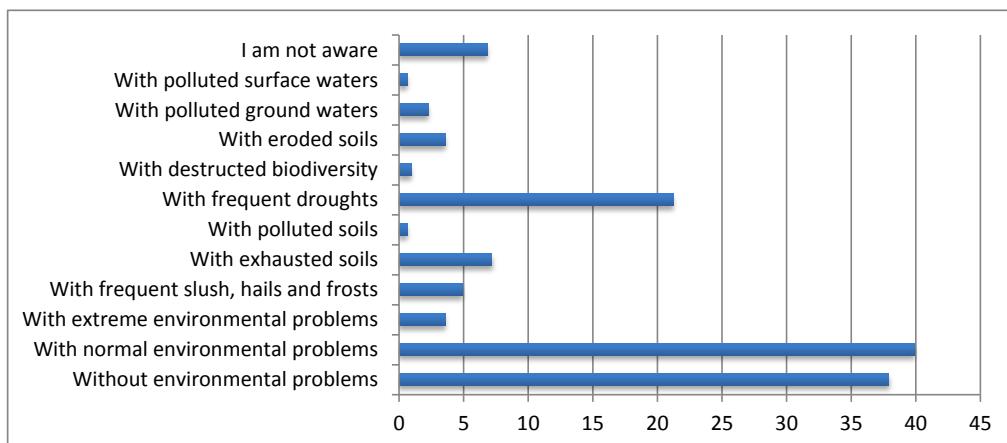
The owners and/or managers of the predominate part of the surveyed farms are males, as most of them are younger than 55 (Figure 1). Moreover, the majority of the participants are young farmers (younger than 40), which indicate the considerable interest of this group of producers toward the amelioration of environmental efficiency of farms.

The survey has found out that almost 7% of the farmers are “not aware” with the environmental problems in the region where their



Source: Survey with agricultural producers, 2014

**Figure 1:** The owner (Manager) of farming enterprise is (percent).



Source: Survey with agricultural producers, May 2014

**Figure 2:** Type of environmental problems in region where farming enterprises is located (percent).

farms are located (Figure 2). According to a good part of the farmers, their holding is located in a region "without environmental problems" (37,9%), while the biggest portion indicate that they are in a region "with normal environmental problems" (39,9%).

However, the number of farms in regions with environmental problems of different type is not minor. More than 21% of the surveyed farms are in regions with "frequent droughts", above 7% are located in regions "with exhausted soils", and almost 5% are in regions "with frequent slush, hails and frosts". What is more, almost 4% of the farmers indicate that their farms are located in regions "with extreme environmental problems" and equal number select regions "with eroded soils", while more than 2% of them are in regions "with polluted ground waters".

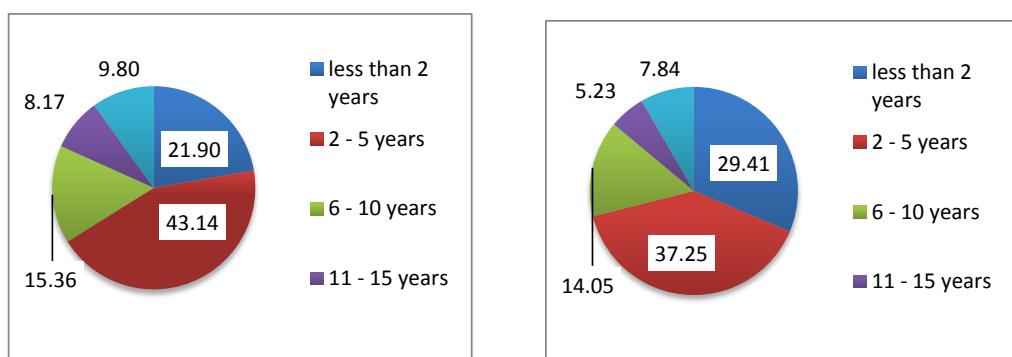
On the other hand, the number of farms in regions "with polluted soils", "with destructed biodiversity" and "with polluted surface waters" is small (below 1%), which is an indicator for the insignificant problems of this sort in the Bulgarian agriculture.

The greatest part of the surveyed farms (65%) are with relatively

little "agricultural experience" pointing out that they are involved in farming for a period up to 5 years, including 21,9% of them "less than 2 years" (Figure 3). The rest of the farmers are with prolong farming experience, but with needs for the additional information and training for the agri-environmental measures of the NPARD and/or formal certification in that area.

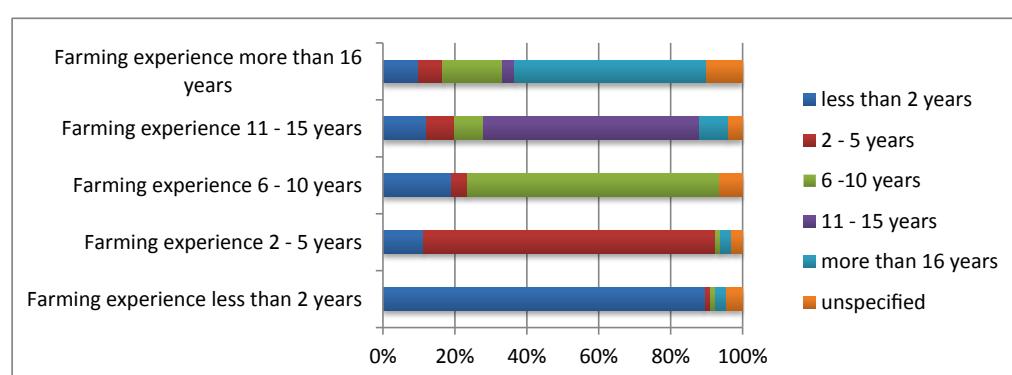
The majority of surveyed farmers indicate that the period in which they take care for the natural environment is between 2 to 5 years (Figure 3). More than 27% of them are with a long-term experience (6 and more years) in the environmental protection. Nevertheless, for a considerable portion of farms (29,4%) the period associated with the protection of natural environment is short ("up to 2 years").

There is a correlation between the period in which surveyed farmers are involved in farming and the period in which they are involved in the environmental protection (Figure 4). However, the tendency is with the increasing the farming experience to decrease the share of farmers with the relevant experience in environmental protection. The later demonstrates that, the specific problem of "environmental management" is relatively new for the most farms in the country.



Source: Survey with agricultural producers, 2014

**Figure 3:** The period in which the enterprise (manager) is involved: (percent) in farming in environmental protection.



Source: Survey with agricultural producers, 2014

**Figure 4:** Period in which enterprises (managers) with different farming experience are involved in environmental protection.

## Forms and Scope of Environmental Management in Farming Enterprises

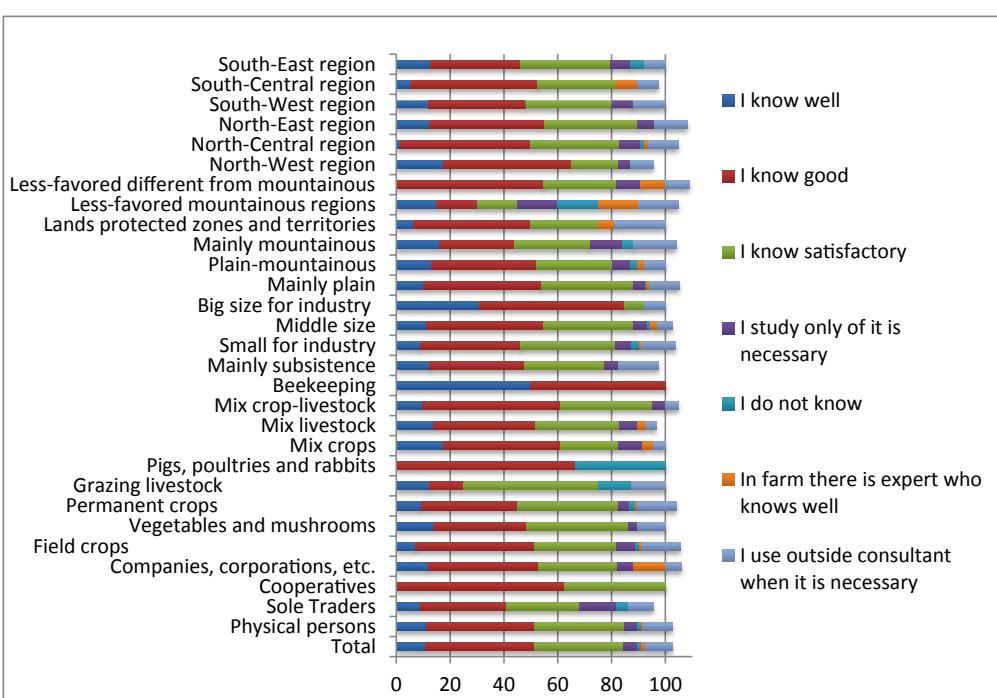
The knowledge and the implementation of the principles of environmentally friendly agriculture is the base of the effective eco-management in agricultural farms. None of the surveyed farms believe that it is “not important to know” the principles of the environmentally sustainable agriculture, which proves a good understanding of the importance of the integration of eco-management in the overall management of farms. According to the more than a half of surveyed farms, they know “well” or “good” the principles of environmentally friendly agriculture (Figure 5). With relatively highest internal capability for the eco-management are the Cooperatives (62,5% of all number), while the share of the Sole Traders with a great ecological competency is the lowest (40,9%).

The most numerous with a good eco-knowledge are among the farms specialized in the beekeeping (100%), pigs, poultry, and rabbits (66,7%), mix crop-livestock production (61%), and mix crops production (60,9%), while the least amount are among those specialized in the grazing livestock (25%). The majority of large farms (84,6%) are characterized with a high knowledge acquiring capability for the eco-management, while the share of farms with small size with a high competency in the area of eco-management is relatively lower (46,3%). Relatively more farms in plain regions of the country (53,8%) know “good” or “very good” the principles of environmentally sustainable

agriculture, while in the mountainous region the portion of farms with similar knowledge is less important (44%). Also a bigger part of the farms in less-favored regions different from the mountainous are with a high eco-competency (54,5%) comparing with the farms in less-favored mountainous regions (30%). The North-Western is with the most significant share of farms with a high eco-knowledge (65,2%), while the South-Eastern region is with the smallest fraction of farms with a good eco-competency (46,1%).

Some farms improve their eco-capability by hiring an expert as part of the Physical Persons (0,8%) and a larger portion of the Companies, Corporations, etc. (11,8%) point out that they “have specialists in the farm, who knows well the principles of environmentally friendly agriculture”. Besides, every tenth farm “use outside consultant if it is necessary”, as the external supply with the eco-knowledge is most popular among the Physical Persons (10,8%) and the Sole Traders (9,1%), the farms which are predominately for subsistence (15%) and with a small size (12,5%), and those specialized in the permanent crops (14,3%), field crops (13,9%), grazing livestock (12,5%), and vegetables and mushrooms (10,3%), as well as farms located in the mountainous regions (16%), with lands in protected zones and territories (18,7%), and less-favored mountainous regions (15%).

However, in a third of the farms, the level of competency in environmentally sustainable agriculture is “satisfactory”. The later means that the internal capability for the effective eco-management in the considerable portion of farms is low. The highest share of farms with



Source: Survey with agricultural producers, 2014

Figure 5: Extent of knowledge of principles of environmentally friendly agriculture in farming enterprises of different type and location\* (percent).

such features are among the Cooperatives (37,5%), farms with a small size (35,3%), those specialized in grazing livestock (50%), vegetables and mushrooms (37,9%) and permanent crops (37,8%), and farms located in plain regions (34,4%), in less-favored regions different from the mountainous (27,3%), and in the North-East region of the country (34,7%).

Furthermore, a good portion of the Sole Traders (4,5%), farms specialized in pigs, poultry, and rabbits (33,3%) and grazing livestock (12,5%), farms located in the less-favored mountainous regions (15%), mainly mountainous regions (4%), and the South-East region of the country (5,1%) indicate that they "do not know" the principles of environmentally sound agriculture. Moreover, some of the farms study the eco-principles "only if that is necessary", as a particularly big is the share of this type of farms among the Sole Traders (13,6%), farms in the mountainous regions (12%), and in the less-favored mountainous regions (15%). Therefore, in the future more efforts are to be put to improve the eco-competency of farms in the later groups with a low eco-culture through education, training, consultation, advises, etc.

The eco-competency is a necessary but not a sufficient condition for the effective eco-management. Due to various reasons (economic, technological, behavioral, etc.) and/or in different periods of time, the farmers not always strictly implement the principles of the environmentally friendly agriculture. According to the majority of surveyed farms they implement "well" (49%) or "completely" (27,4%) the eco-principles in agriculture (Figure 6). Nevertheless, the share of farms implementing these principles "satisfactorily" is not small (18%), while those "not implementing at all" are minority (0,3%).

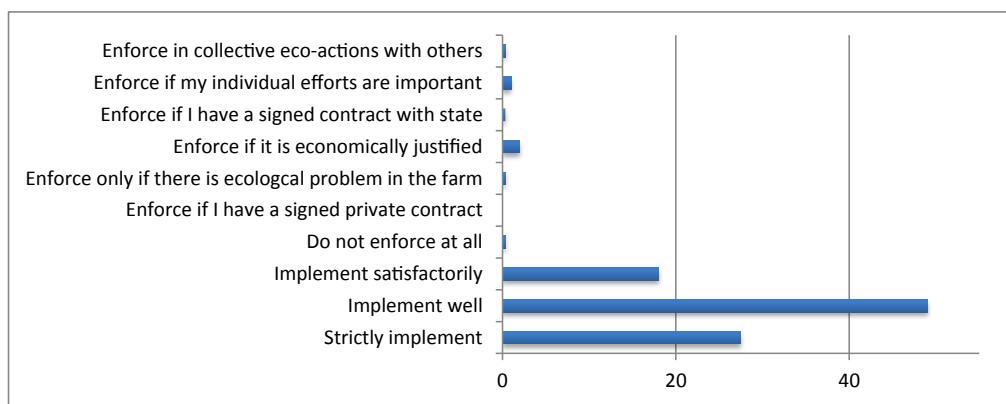
A small fraction of the surveyed Physical Persons indicate that the implementation and enforcement of the eco-principles in the farm depends on certain conditions such as the economic justification, the

importance of eco-actions, an ecological problem in the farm, a contract with the state, or the collective actions with other agents. For instance, for 2,3% of the later farms this is the "economic justification", as these are mainly farms with a large size and predominantly for subsistence, farms specialized in field crops, vegetables and mushrooms, permanent crops, mix crops and mix livestock productions.

A part of the Physical Persons (1,2%) implement eco-principles only "if their individual efforts are important", and those are entirely small farms in permanent crops. A quarter of the farms specialized in beekeeping enforce eco-principles "only if there is an ecological problem in the farm". A tiny portion of the Physical persons (0,4%) implements eco-principles "if there is a contract with the state", and those are exceptionally subsistence farms specialized in mix crops production. Another small section of the Physical Persons (0,4%) points out implementing the eco-principles in case of "collective actions with others", and those are small farms in permanent crops and field crops. For none of the farms the "existence of a private contract" is a condition for the implementation of eco-principles, which shows that this form is not important for the Bulgarian farms at current stage of development.

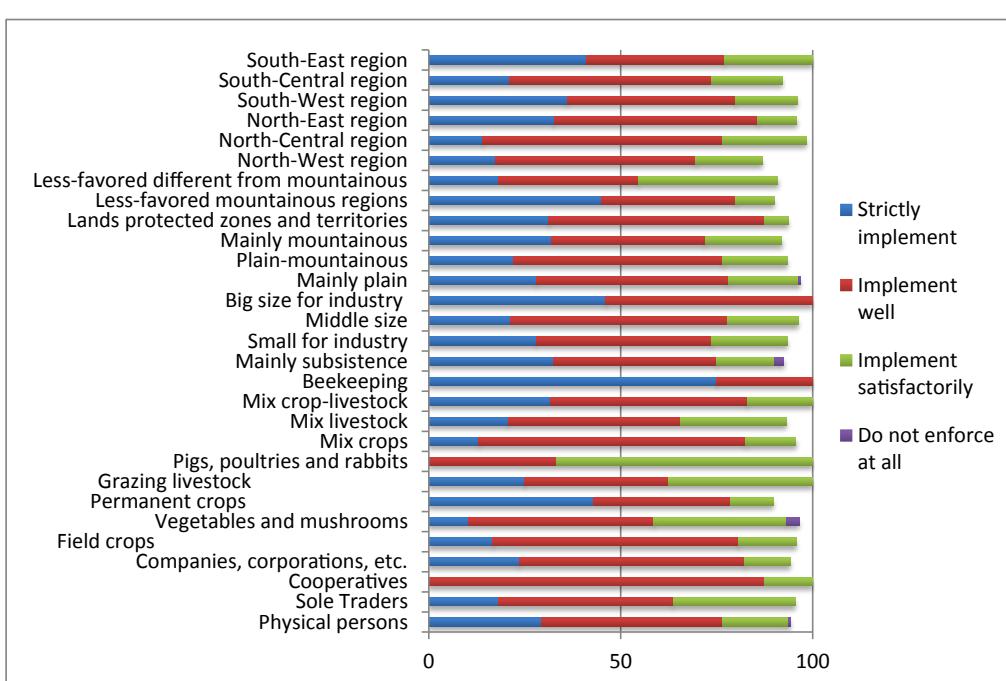
To the greatest extent ("strictly" or "well") implement the principles for environmentally sound agriculture the large-scale farms (100%), the Cooperatives (87,5%) and the Companies, Corporations, etc. (82,3%), the farms specialized in beekeeping (100%), mix crop-livestock production (82,9%) and mix crops production (82,6%), and those located in the plain regions (77,9%), with lands in protected zones and territories (87,5%), less-favored mountainous regions (80%), and in the North-East (85,7%) and the South-West (80%) regions of the country (Figure 7).

On the other hand, the share of farms "not enforcing" eco-principles is relatively smaller for the Sole Traders (63,6%), farms



Source: Survey with agricultural producers, 2014

Figure 6: Extent and conditions of enforcement of principles of environmentally-friendly agriculture in farming enterprises (percent).



Source: Survey with agricultural producers, 2014

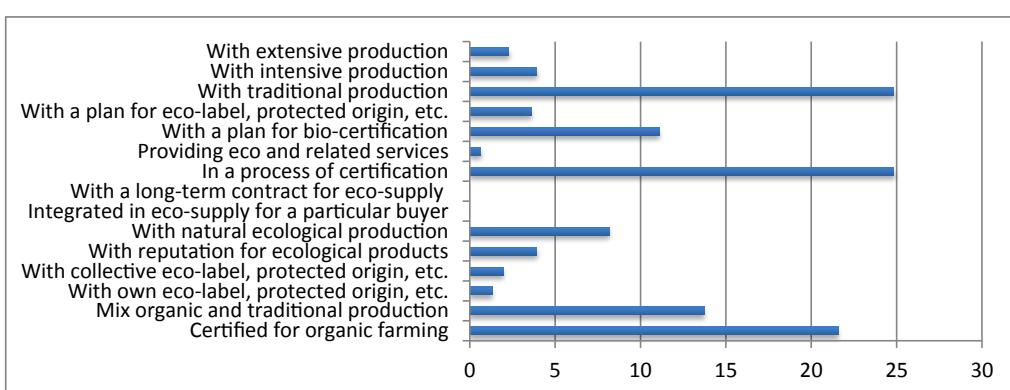
Figure 7: Extent and conditions of enforcement of principles of environmentally-friendly agriculture in farming enterprises of different type and location (percent).

specialized in pigs, poultry and rabbits (33,3%) and vegetables and mushrooms (58,6%), those with a smaller size (73,5%), and located in the mountainous regions (72%), in less-favored regions different from the mountainous (54,5%), and in the North-West region of the country (69,6%).

The transition to officially certified organic production is a major form for the eco-management in Bulgarian agricultural farms. Here the eco-behavior of the agricultural producers is regulated and stimulated by the dynamics of market demands and the premium to the market prices of certified organic products. Simultaneously, the authenticity of products and the adequacy of the eco-activity with the officially set up standards is controlled by the independent bodies. Our survey has also confirmed that a relatively bigger portion of the eco-active farms

are already “certified for the organic production” (21,6%) and around a quarter of them are “in a process of certification” (Figure 8).

A part of the farms “experiment” with the organic agriculture along with the conventional production, as almost 14% of the surveyed inform that they are “with mix organic and traditional production”, including 14,3% of the Physical Persons, 23,5% of the Companies, Corporations, etc. and 4,5% of the Sole Traders. The other private and market forms for the eco-management are less used in the surveyed farms, predominately by the Physical Persons. For instance, merely 1,5% of the Physical Persons are “with own eco-label, protected origin, etc.”, 2,3% have “collective eco-label, protected origin, etc.”, and 0,8% “provide eco and related services”. At the same time none of the surveyed farms is “integrated for eco-supply for a particular buyer” or has a “long-term



Source: Survey with agricultural producers, 2014

Figure 8: Share of farming enterprises applying different forms of eco-management (percent).

contract for eco-supply for a particular buyer". Nevertheless, there are widely employed informal private and market forms for the eco-management as 9,3% of the surveyed Physical Persons point out that they are "with naturally ecologically pure production", and 4,6%, of them having built a "reputation for ecologically pure products".

In addition, a good portion of the farms has plans for a "bio-certification" (above 11%) or for an "eco-label, protected origin, etc." (5,9% of the Companies, Corporations, etc. and 3,9% of the Physical Persons). About a quarter of the surveyed farms estimate that they are with a "traditional production", including a three-quarters of the Cooperatives, 31,8% of the Sole Traders, 23,5% of the Companies, Corporations, etc. and 22,4% of the Physical Persons. A bigger share of firms characterize their production as "intensive" (13,6% of the Sole Traders and 17,6% of the Companies, Corporations, etc.), while among the Physical Persons this percent is 2,3% and zero for the Cooperatives. At the same time, only 5,9% of the surveyed Companies, Corporations, etc. and 2,3% of the Physical Persons describe their production as "extensive".

A portion of the surveyed farms (with exception of the Cooperatives) also has own initiative or participates in another private, collective or state initiatives for the protection of the nature (Figure 9). For instance, 28,2% of the Physical Persons, 18,2% of the Sole Traders, and 17,6% of other type of firms "implement own eco-initiative".

Furthermore, some of the farms implement a contractual form as 9,3% of the Physical Persons report having "a signed private eco-contract", while 6,4% of the Physical Persons, 5,9% of the Companies, Corporations, etc. and 4,5% of the Sole Traders having "a signed eco-contact with the state".

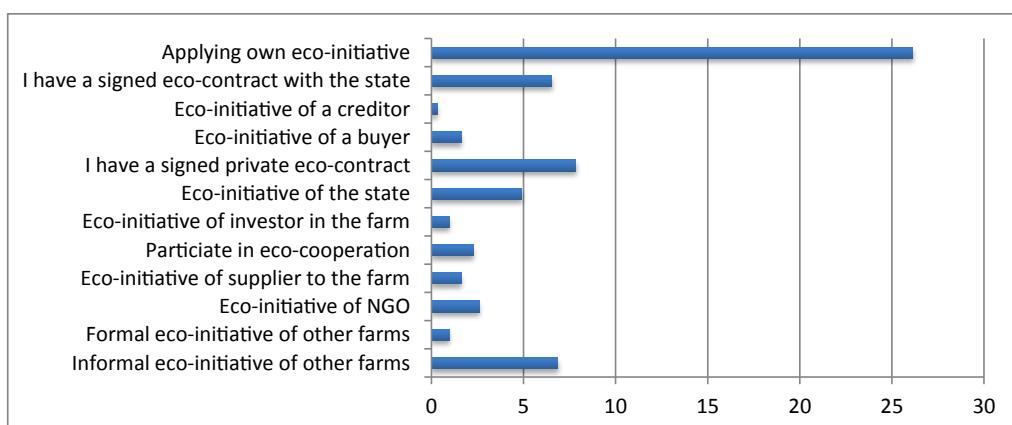
A part of the farms participate in the eco-initiatives of other farms and organizations. For 8,1% of the Physical Persons this is "informal initiative of other farms"; for 17,6% of the Companies, Corporations, etc. and 4,5% of the Sole Traders, and 3,9% of the Physical Persons that is an "eco-initiative of the state"; and for 5,6% of the Companies, Corporations, etc. and for 1,5% of the Physical Persons this is an "eco-initiative of the supplier to the farm". Besides, a small fraction of the Physical Persons participate in an "eco-initiative of a non-governmental organization" (3,1%), "eco-initiative of a buyer" (1,9%), "formal eco-initiative of other farms" (1,2%), "eco-initiative of the investor in the farm" (1%), and "eco-initiative of a creditor" (0,4%). Also a portion of the surveyed Companies, Corporations, etc. (5,9%), and Physical

Persons (1,9%) report that "participate in an eco-cooperative". The later farms use the cooperative form for realization of a higher ("collective") eco-effect or as a necessary condition for the participating in some public or private initiative (program).

Certified for the organic production, in a process of bio-certification or with a plan for the bio-certification are entirely the Physical Persons and the Sole Traders, where each second applies ("officially certified" or "in transition to") the norms of the organic agriculture (Figure 10). On the other hand, none of the Cooperatives, Companies, Corporations, etc. is using or is planning that particular form of eco-management. The greatest part of the certified for the organic production is among the farms specialized in the permanent crops (39,8%), vegetables and mushrooms, (20,7%), mix livestock production (24,1%), and mix crop-livestock production (19,5%). At the same time, the share of farms with complete certification among those specialized in field crops and mix crops production is small (accordingly 5,5% and 8,7%), while none of the farms with "pure" livestock specialization (grazing livestock, pigs, poultry, and rabbits, and beekeeping) has been officially certified.

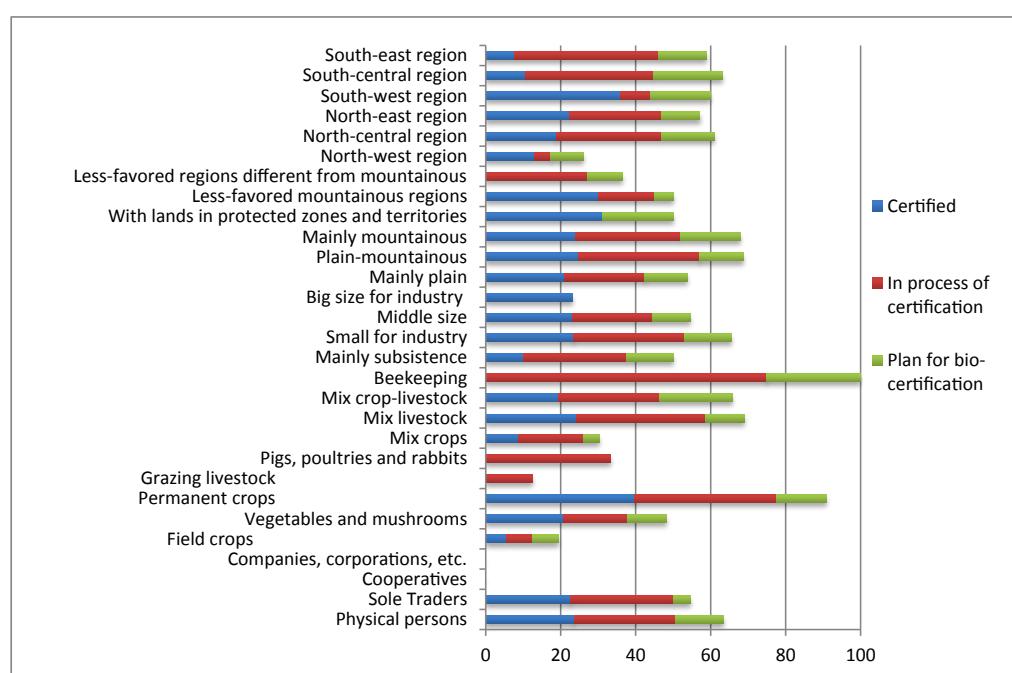
Simultaneously, in a process of organic certification are farms of all type of specialization, as the biggest share is among the groups specialized in beekeeping (75%), permanent crops (37,7%), mix livestock production (34,5%), and pigs, poultry and rabbits (33,3%). Therefore, the majority of surveyed farms specialized in permanent crops (77,5%), beekeeping (75%), and mix livestock (58,6%), and a good portion of those specialized in mix crop-livestock production (46,3%), vegetables and mushrooms (37,9%), and pigs, poultry and rabbits (33,3%) practically implement ("officially" or "in a transition to") the principles of the organic agriculture. What is more, with a plan for the bio-certification are a part of the farms with different specialization, with exception of those in grazing livestock, and pigs, poultry and rabbits. Consequently, in a near future, all of the farms specialized in beekeeping, and almost all holdings in the permanent crops, will apply the organic form for eco-management.

The biggest part of the farms certified for the organic production or in the process of bio-certification is with a small and a middle size for the sector. On the other hand, while the share of large-scale bio-certified farms is similar to that of small and middle sized none of them is in a process or with a plan for bio-certification. The share of bio-certified farms among those for subsistence is small, but many of them are in a process or with a plan for bio-certification. Therefore, in near future every other of the "non/semi-market" farms (predominately for



Source: survey with agricultural producers, 2014

**Figure 9:** Share of farming enterprises participating in various initiatives for protection of nature (percent).



Source: survey with agricultural producers, 2014

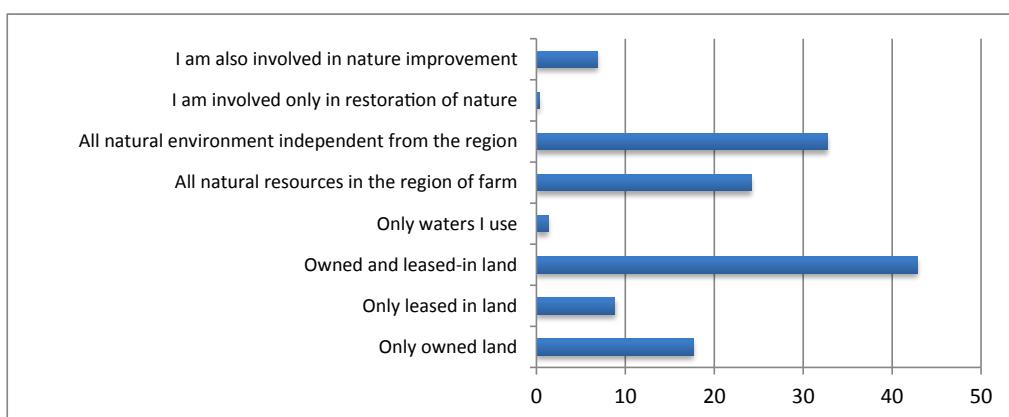
**Figure 10:** Organic production in farming enterprises of different type and location (percent).

subsistence) will apply this “market-oriented” form of eco-management. The share of farms with bio-certification, in a process of certification, or with a plan for bio-certification, in the overall number of farms in the plain-mountainous regions is in more advance stage. The same is true for the farms with lands in protected zones and territories, and in the less-favored mountainous regions in contrast to the farms in less-favored regions different from the mountainous where there is still no bio-certified farm. The South-West region is with the greatest share of farms, which are certified for the organic production. In the other regions of the country, the portion of farms in the process of bio-certification is considerable, with the exception of the North-West region with a comparatively small fraction of the farms implementing (officially or in transition to) the norms of organic agriculture. All these

figures give a good insight on the structure and the prospect of the organic production in Bulgarian farms since no other comparable data are practically available.

The scope of the eco-management is not equal to all of the surveyed farms (Figure 11). For instance, for 17,6% of the farms the cares for protection of the natural environment are focused “only on owned land”, including for 19,3% of the Physical Persons, 13,6% of the Sole Traders, and 12,5% of the Cooperatives.

A portion of the farms are looking after protection “only of leased-in land” (8,8%), and the later concerns 12,5% of the Cooperatives, 9,3% of the Physical Persons, and 9,1% of the Sole Traders. However, the greatest share of the farms concentrate their efforts on the protection



Source: Survey with agricultural producers, 2014

Figure 11: Scale of eco-management in farming enterprises\*(percent).

of the “owned and leased-in land” (42,8%), as such approach apply 64,7% of the surveyed Companies, Corporations, etc. 62,5% of the Cooperatives, 40,9% of the Sole Traders, and 40,5% of the Physical Persons. Also some small fraction of the Companies, Corporations, etc. (5,9%) report focusing its care “only on waters which they use”. Besides, a considerable portion of the surveyed farms take care for “all natural resources in the region of the farm” (24,2%), including 25,9% of the Physical Persons, 29,4% of the Companies, Corporations, etc. and 9,1% of the Sole Traders. What is more, for 32,6% of the surveyed farms the cares for the protection of natural environment cover the “natural environment as a whole independent from the region”, including for a half of the Cooperatives, 32,4% of the Physical Persons, 29,4% of the Companies, Corporations, etc., and 27,3% of the Sole Traders. Furthermore, a small portion of the Physical Persons is “only involved in restoration of the natural environment”. A little bit bigger fraction of the surveyed farms “are involved also with the improvement of the natural environment” (6,9%), including 12,5% of the Cooperatives, 6,6% of the Physical Persons, 5,9% of the Companies, Corporations, etc. and 4,7% of the Sole Traders.

## Factors for Eco-Management in Farming Enterprises

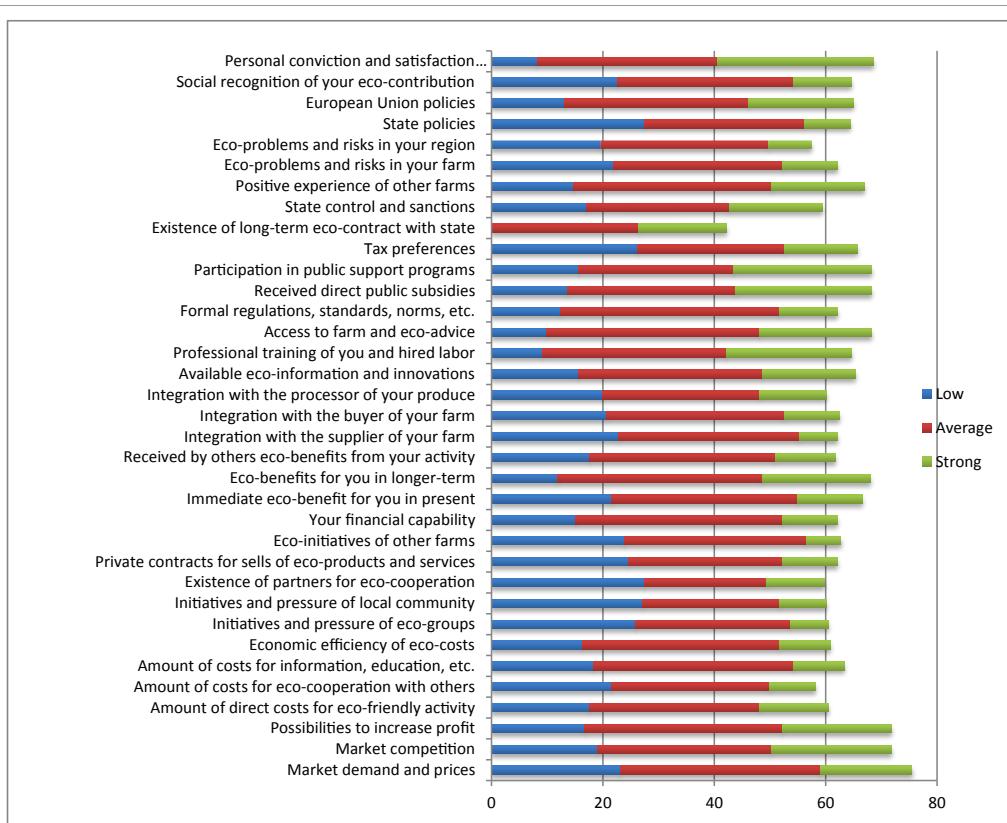
The different ideological, economical, market, public, etc. factors in various extent stimulate or restrict the activities of agricultural producers for the protection of natural environment. To the greatest extent the eco-activity of a big part of the surveyed farms is stimulated by: the “personal conviction and satisfaction of farmers from the eco-activity” (28,1%), farm “participation in the public support programs” (24,8%), “received direct public subsidies” (24,5%), “professional eco-training of the farmer and the hired labor” (22,5%), “market competition” (21,6%), “access to the farm and eco-advises” (20,3%), “possibilities to increase profit” (19,6%), “eco-benefits for your farm in the longer-term” (19,3%), and “European Union policies” (18,9%) (Figure 12). For the different type of farms there is a considerable variation in ranging of the factors, which stimulate their eco-activity. For instance, the eco-actions of the most Physical Persons to the greatest extend in stimulated by: the “personal conviction and satisfaction of the farmer from the eco-activity” (29%), “participation in the public support programs” (23,5%), “received direct public subsidies” (22,4%), “professional eco-training of the farmer and the hired labor” (21,6%), “access to the farm and eco-advises” (20,8%), “market competition” (20,5%), and “possibilities to increase profit” (20,5%).

The eco-actions of the majority of the Sole Traders to the greatest extent are stimulated by: the “participation in the public support programs” (50%), “professional eco-training of you and the hired labor” (45,4%), “received direct public subsidies” (36,4%), “integration with the processor of your produce” (31,8%), “personal conviction and satisfaction of the farmer from the eco-activity” (27,3%), “European Union policies” (27,3%), “possibilities to increase profit” (22,7%), “economic efficiency of eco-costs” (22,7%), “immediate eco-benefit for the farm in the present” (22,7%), “eco-benefit for the farm in the long run” (22,7%), “integration with the supplier of your farm” (22,7%), “available eco-information and innovations” (22,7%), and “tax preferences” (22,7%).

For the most Companies, Corporations, etc. the factors, which mostly stimulate the eco-actions are: the “received direct public subsidies” (47,1%), “market competition” (41,2%), “European Union policies” (41,2%), “state control and sanctions” (35,3%), “eco-benefit for the farm in the long run” (35,3%), “personal conviction and satisfaction from the eco-activity” (29,4%), “immediate eco-benefit for the farm in the present” (23,5%), “market demand and prices” (23,5%), “participation in the public support programs” (23,5%), “access to the farm and eco-advises” (23,5%), “financial capability of the farm” (23,5%), and “social recognition of the eco-contribution of your farm” (23,5%). For the Cooperative farms there have not been reported factors strongly stimulating and restricting eco-activities, which are common for the majority of this type of holdings.

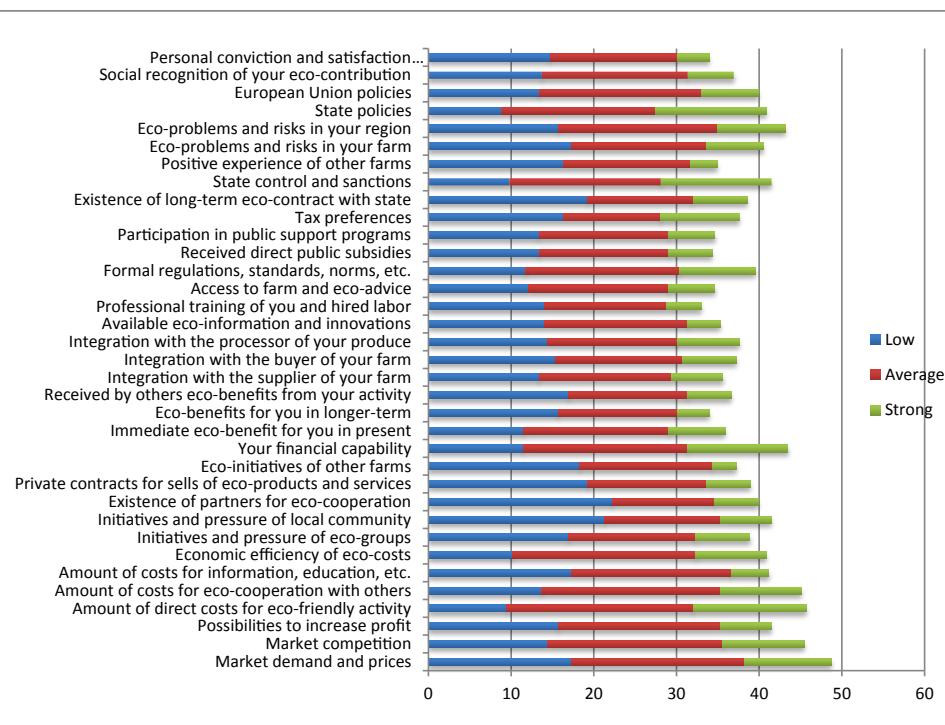
According to the biggest part of the surveyed farms their eco-activities to the greatest extent is restricted by the following factors: the “amount of direct costs for eco-friendly activity” (13,7%), “state control and sanctions” (13,4%), “state policies” (13,4%), “financial capability of the farm” (12,1%), “market demand and prices” (10,5%), “market competition” (9,8%), and “amount of costs for eco-cooperation with others” (9,8%) (Figure 13).

For the different type of farms the factors, which mostly restrict the eco-activity are quite specific. The eco-actions of the biggest part of the Physical Persons to the greatest extend are restricted by: the “amount of direct costs for eco-friendly activity” (14,3%), “state control and sanctions” (14,3%), “state policies” (13,9%), “financial capability of the farm” (12,7%), “market competition” (10,4%), and “tax preferences” (10,4%). For the most part of the Sole Traders the eco-activity to the greatest extent is restricted by: the “amount of direct costs for



Source: Survey with agricultural producers, 2014

Figure 12: Extent in which eco-activities of farming enterprises is stimulated by various factors (percent).



Source: Survey with agricultural producers, 2014

Figure 13: Extent in which eco-activity of farming enterprises is restricted by various factors (percent).

ecofriendly activity" (9,1%), "financial capability of the farm" (9,1%), "market competition" (9,1%). For the most Companies, Corporations, etc. the dominant obstacles for the eco-activities are: the "amount of costs for eco-cooperation with others" (29,4%), "official regulations, standards, norms, etc." (23,5%), "state policies" (23,5%), "amount of direct costs for ecofriendly activity" (17,6%), "immediate private eco-benefits in the present moment" (17,6%), "private eco-benefit in the long run" (17,6%), "eco-benefits from your activity received by others" (17,6%), "access to the farm and eco-advises" (17,6%), "existence of a long-term contract with the state" (17,6%), "economic efficiency of eco-costs" (11,8%), "availability of partners for eco-cooperation" (11,8%), "financial capability of your farm" (11,8%), "integration with the processor of your produce" (11,8%), "available ecological information and innovations" (11,8%), "professional eco-training of the farmer and the hired labor" (11,8%), "state control and sanctions" (11,8%), "environmental problems and risks in your farm" (11,8%), and "tax preferences" (11,8%). Identified incentives and restrictions for the different type of agricultural farms are to be taken into account in the process of improvement of the public policies and programs for agro-ecology and eco-management.

The public support with diverse instruments of the EU CAP is an important factor for the improvement of eco-management of agricultural farms in the country. For instance, the direct Area base payments are linked with the requirement to "keep farmland in good agronomical and ecological state", the participation in the measures of the NPARD is associated with the compliance of the "good agricultural practices" (including appropriate protection of soils, waters, biodiversity, animal welfare, etc.), the involvement in the "environmental measures" of the NPARD aims at implementation of higher eco-standards in comparison to the good agricultural practices, etc.

What is more, the public intervention (subsidizing, zoning, mandatory eco-norms and standards, market support, etc.) leads to development of diverse bilateral, trilateral, hybrid, etc. forms of governance of the agrarian sphere as well as of the eco-management in the sector. All they let improve the overall and the environmental protection capabilities of agricultural farms, and conserve, restore and/or improve natural resources through agricultural activity. In particular, the public subsidies make "economically possible" the agricultural activity in "less-favored" regions and in protected zones and territories (national parks, reserves, NATURA 2000, etc.) supporting conservation of the soil fertility, natural biodiversity, services of (agro)eco-systems, etc.

The received public support by the surveyed farms (with "higher eco-activity") is relatively higher than the average in the country for the farms of a similar type and location. The most of the surveyed farms received in the past or are currently receiving support through Measure 214 "Agro-environmental payments" of the NPARD (55,6%), the Directs Area-based payments from the EU (46,7%), Measure 141 "Semi-subsistence farming" (40,2%) and Measures 111, 114 and 143 "Professional training and advise" (37,6%), the National tops-ups for products, livestock, etc. (31%), Measure 112 "Setting up of young farmers" (28,8%), and Measure 121 "Modernization of agricultural holdings" (27,8%) (Figure 14).

For other Measures of the NPARD the shares of participating farms in the forms of direct public support in relatively small. Nevertheless, comparing to the rest of the farms in the country, the "eco-active" farms take advantage to a greater extent from the "environmental measures" of the NPARD such as Measure 214 "Agro-environmental payments"; Measure 211 "Natural handicap payments to farmers in mountain areas"

(19,3%), Measure 212 "Payments to farmers in areas with handicaps, other than mountain areas" (17,3%), and Measure 213 "Payments for NATURA 2000 for farmlands" (17,6%).

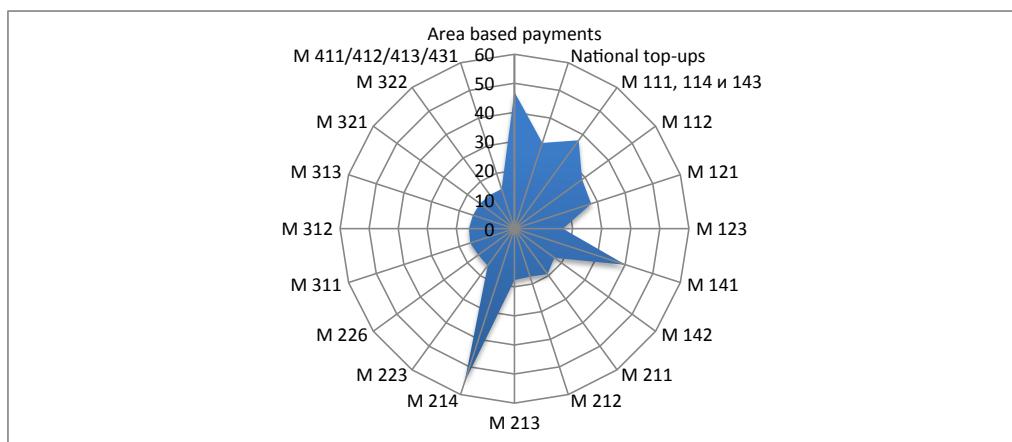
The actual public support with the various mechanisms of the EU CAP to farms of different juridical type is quite different. For instance, a comparatively higher share of the Companies, Corporations, etc. have been taken advantage from the Area-based payments (70,6%), Agro-environmental payments (70,6%), and the National tops ups for products, livestock, etc. (47,1%) (Table 2). On the other hand, the relative portions of the beneficiaries from the Measures 111, 114, 143 "Professional training and advises" is higher for the Sole Traders (40,9%) and the Physical Persons (39%), while of the Measure 141 "Semi-subsistence farming" for the Physical Persons (43,6%). The surveyed Cooperatives are leaders only for the Measure 121 "Modernization of agricultural holdings" (37,5%), while their relative share is lower for the "area-based payments" and the "national tops ups" (12,5%), and Measures 112 "Setting up of young farmers" (12,5%), 213 "Payments for NATURA 2000 for farmlands" (12,5%) 214 "Agri-environmental payments" (25%), and without beneficent for all other measures from the NPARD. There is also a great differentiation in the support through various measures for the farms with different specialization, size and location.

For instance, to the biggest extent from the area-based payments have been taking advantage the farms specialized in mix crops-livestock (63,4%), in less favored regions different from the mountainous (63,6%), and those with lands in protected zones and territories (62,5%). Simultaneously, the relative portion of the beneficiaries from the direct area-based European subsidies for the farms specialized in mix livestock (24,1%), beekeeping (25%), vegetables and mushrooms (34,5%) is lower or zero (pigs, poultry and rabbits).

Likely wise, comparatively the biggest share of the beneficiaries of the "agro-environmental payments" are among the Physical Persons (56,4%), large-scale farms (61,5%) and those with lands in protected zones and territories (75%), and farms specialized in field crops (66,7%), mix crops-livestock production (63,4%), and mix livestock production (62,1%). At the same time, a relatively smaller-share of farms specialized in vegetables and mushrooms (34,5%) and grazing livestock (37,5%), and none in these in pigs, poultry and rabbits have received this type of subsidy.

In another main eco-measure "Natural handicap payments to farmers in mountain areas" the greatest share of the beneficiaries are among the Physical Persons (20,5%), farms specialized in vegetables and mushrooms (27,6%), predominantly subsistence holdings (37,5%), farms with lands in protected zones and territories (56,2%) and located in less-favored mountainous regions (40%). Simultaneously none of the farms specialized in pigs, poultry and rabbits, and beekeeping, and relatively a smaller portion of the farms in grazing livestock (12,2%) and large size (7,7%) have got this type of payments.

There is also a great variation in the support by the individual measures in different regions of the country. For example, the relative share of the beneficiaries of the Area-base payments in the North-West and the North-East regions are higher than in the other regions of the country- accordingly 56,5% and 53,1% of the surveyed farms. On the other hand, the beneficiaries of the National tops ups from the South-Central and the South-East regions are relatively more than in the other regions of the country-accordingly 42,1%, 41% of the farms. Likely wise, the North-West region, South-West region and South-East region are among the leaders regarding the numbers of supported farms by



Source: Survey with agricultural producers, May 2014

**Figure 14:** Share of farming enterprises supported with different instruments of EU CAP (percent).

	Area based payments	National tops ups	M 111, 114, 143	M 112	M 121	M 123	M 141	M 142	M 211	M 212	M 213	M 214	M 223	M 226	M 311	M 312	M 313	M 321	M 322	M 411, 412, 413, 431
<b>Physical Persons</b>	46,3	30,9	39	30,5	26,2	17	43,6	17,8	20,5	17,8	18,1	56,4	16,2	15,8	16,2	16,2	15,4	15	15	15
<b>Sole Traders</b>	36,4	22,7	40,9	22,7	36,4	18,2	31,8	13,6	13,7	13,6	13,6	40,9	13,6	13,6	18,2	13,6	13,6	13,6	13,6	13,6
<b>Cooperatives</b>	12,5	12,5	0	12,5	37,5	0	0	0	0	0	0	12,5	25	0	0	0	0	0	0	0
<b>Companies, Corporations, etc.</b>	70,6	47,1	29,4	17,6	35,3	17,6	17,6	17,6	17,6	23,5	17,6	70,6	17,6	17,6	17,6	17,6	17,6	17,6	11,8	11,8
<b>Field crops</b>	50											18,1								
<b>Vegetables and mushrooms</b>	34,5											27,6								
<b>Permanent crops</b>	50											19,4								
<b>Grazing livestock</b>	50											12,5								
<b>Pigs, poultrys and rabbits</b>	0											0								
<b>Mix crops</b>	47,8											17,4								
<b>Mix livestock</b>	24,1											17,2								
<b>Mix crop-livestock</b>	63,4											22								
<b>Beekeeping</b>	25											0								
<b>Mainly subsistence</b>	52,5											37,5								
<b>Small for industry</b>	49,3											16,9								
<b>Middle size</b>	41,7											16,7								
<b>Big size for industry</b>	46,											7,7								
<b>Mainly plain</b>	46,2											14,5								
<b>Plain-mountainous</b>	49,3											22,1								
<b>Mainly mountainous</b>	51											36								
<b>With lands in protected zones and territories</b>	62,5											56,2								
<b>Less-favored mountainous regions</b>	40											40								
<b>Less-favored regions different from mountainous</b>	63,6											27,3								
<b>North-west region</b>	56,5	34,8	39,1	39,1	34,8	26,1	52,2	30,4	30,4	26,1	30,4	60,9	26,1	21,7	21,7	21,7	21,7	21,7	21,7	
<b>North-central region</b>	46,9	34,4	40,6	25	20,3	14,1	40,6	12,5	10,1	12,5	17,2	57,8	12,5	12,5	12,5	14,1	12,5	12,5	10,9	
<b>North-east region</b>	53,1	30,6	36,7	18,4	24,5	10,2	46,9	10,2	10,2	10,2	10,2	55,1	10,2	10,2	10,2	10,2	10,2	10,2	10,2	
<b>South-west region</b>	40	32	52	40	32	32	28	32	32	24	32	44	24	24	28	24	24	24	24	
<b>South-central region</b>	52,6	42,1	47,4	34,2	34,2	18,4	36,8	18,4	21	23,7	21	52,6	18,4	18,4	15,8	18,4	15,8	15,8	15,8	
<b>South-east region</b>	48,7	41	36	33,3	38,5	23,1	41	25,6	33,3	28,2	20,5	66,7	23,1	25,6	28,2	25,6	23,1	23,1	23,1	

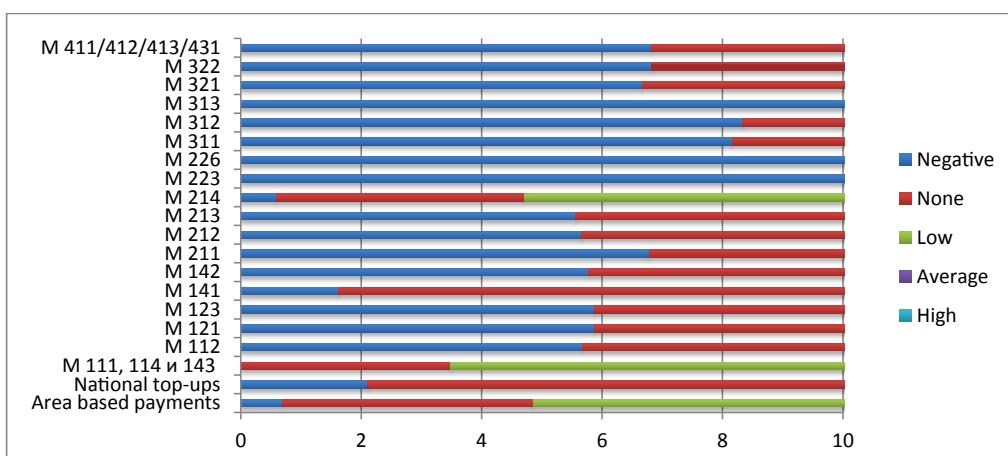
Source: Survey with agricultural producers, May 2014

**Table 2:** Share of farming enterprises of different type and locations supported by individual instruments of EU CAP (percent).

majority of the NPARD measures, including the special “eco-measures”. For instance, the biggest share of farms with “Agro-environmental payments” and “Natural handicap payments to farmers in mountain areas” are in the South-East (66,7% and 33,3% correspondingly) and the North-West (60,9% and 30,4% correspondingly) regions. On the other hand, the North-East and the South-Central regions are among the leaders only for one of the measures (accordingly Measure 141 and Measures 111, 114,143), while the North-Central region for none of the public support instruments.

The individual mechanisms for support of the EU CAP impact

unequally the agricultural farms, which received or are receiving public support (Figure 15). According to the majority of surveyed farms, the biggest (“average” or “strong”) impact on their farms have been caused by the Measures 111, 114,143 “Professional training and advices” (86,9%), Measure 214 “Agro-environmental payments” (83,5%), “Direct Area-based subsidies by the EU” (75,7%), Measure 112 “Setting up of young farmers” (69,3%), Measure 141 “Semi-subsistence farming” (66,7%), Measure 121 “Modernization of agricultural holdings” (63,5%), “National tops ups for products, livestock, etc.” (48,4 %) and Measure 211 “Natural handicap payments to farmers in mountain areas” (47,4%).



Source: Survey with agricultural producers, 2014

**Figure 15:** Scale of impact on supported farming enterprises of different instruments of EU CAP (percent).

The impact of the remaining instruments of the CAP on the greatest part of the surveyed beneficiaries is “low” or “none”. What is more, a part of the farms evaluate the impact of the public support instruments on their holdings as “negative”. The later concerns more than 10% of the beneficiaries from the Measure 223 “First afforestation of non-agricultural land”, Measure 226 “Restoring forestry potential and introducing prevention actions”, and Measure 313 “Encouragement of tourism activities”.

The impacts of the eco-measures of the NPARD on surveyed farms of different type and location is dissimilar. For instance, for the two-third of the Sole Traders and the Cooperatives, supported in the past or currently with the Measure 214 “Agro-environmental payments”, the impact of that instrument on their farms is “strong” (Figure 16). Likewise, that measure effect is strong on the majority of farms specialized in the fields crops (64,6%), grazing livestock (66,7%), mix livestock production (61,1%), mix crop-livestock production (57,7%), the large scale farms (87,5%), and the farms located in less-favored mountainous regions (66,7%) and the North parts of the country (correspondingly for the North-West region - 64.3%, the North-Central region - 56.8%, and the North-East region - 55.6%). For the remaining fractions of the farms the impact of the agro-environmental payments is with lower significance. Moreover, according to one fifth of the supported farms in vegetables and mushrooms, and a good portion of predominately subsistence farms (17,4%), as well as farms situated in the South-West region of the country (18,2%) these type of payments has got no impact at all.

Similarly, according to the bulk of the supported farms in the less-favored mountainous regions (75%), those with lands in the protected zones and territories (44,4%), the Sole Traders (33,3%), the farms specialized in permanent crops (36,8%), and the holdings located in the South-West region of the country (37,5%), the impact of the Measure 211 “Natural handicap payments to farmers in mountain areas” on their farms in “strong” (Figure 17).

Nevertheless, for the greatest part of the farms, the impact of these type of payments is “neutral”, including for all of the supported Companies, Corporation, etc. a three-quarters of the specialized in mix crops production, 38,5% of the farms in field crops and 37,5% in vegetables and mushrooms, 37,4% of the holdings located in plain

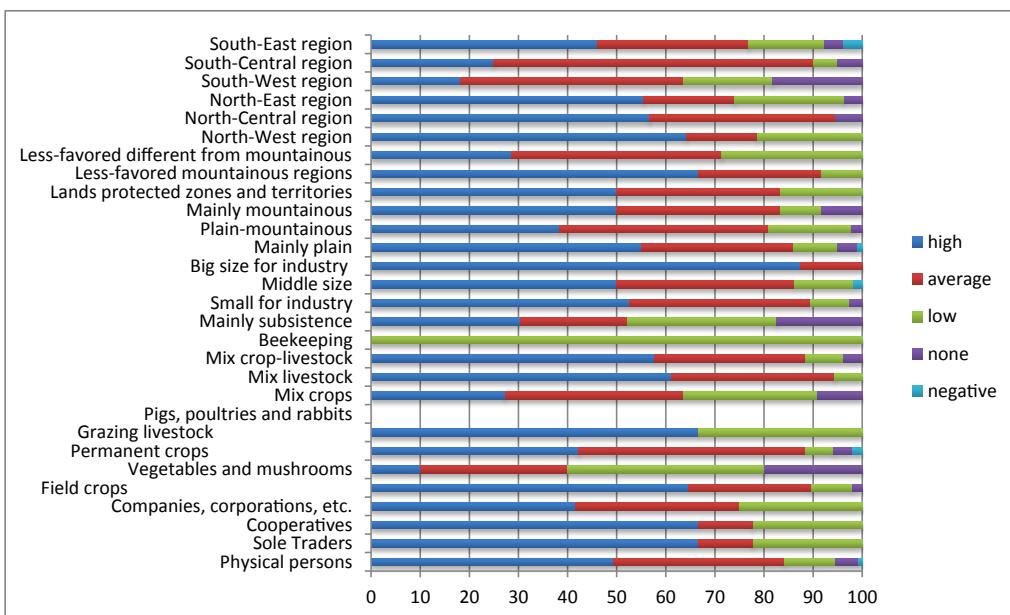
regions, a third of farms with middle sizes, with lands in protected zones and territories, and in less-favored regions different from the mountainous, 26,7% of the predominately subsistence farms, 22,6% of the Physical Persons, 22,2% of the mix crops-livestock holdings, and a considerable portion of the beneficiaries in the North-West (57%), North-Central (44,4%), North-East (40%) and South-Central (37,5%) regions of the country. Furthermore, for a significant part of the beneficiaries the effect of that type of support on their farms is “negative”, including for all large-scale holdings, one-third of the Sole Traders, 23,1% of the farms in the South-East region of the country, each fifth of the farms with mix livestock production, and 15,4% of the farms specialized in field crops. Therefore, the accrual and likely effects of the different instruments of public support on the diverse type of agricultural holdings is to be taken into account in the process of the improvement and the design of support measures during the next programming period.

## Efficiency and Perspectives of Eco-Management in Farming Enterprises

### Specific impact on individual components of environment

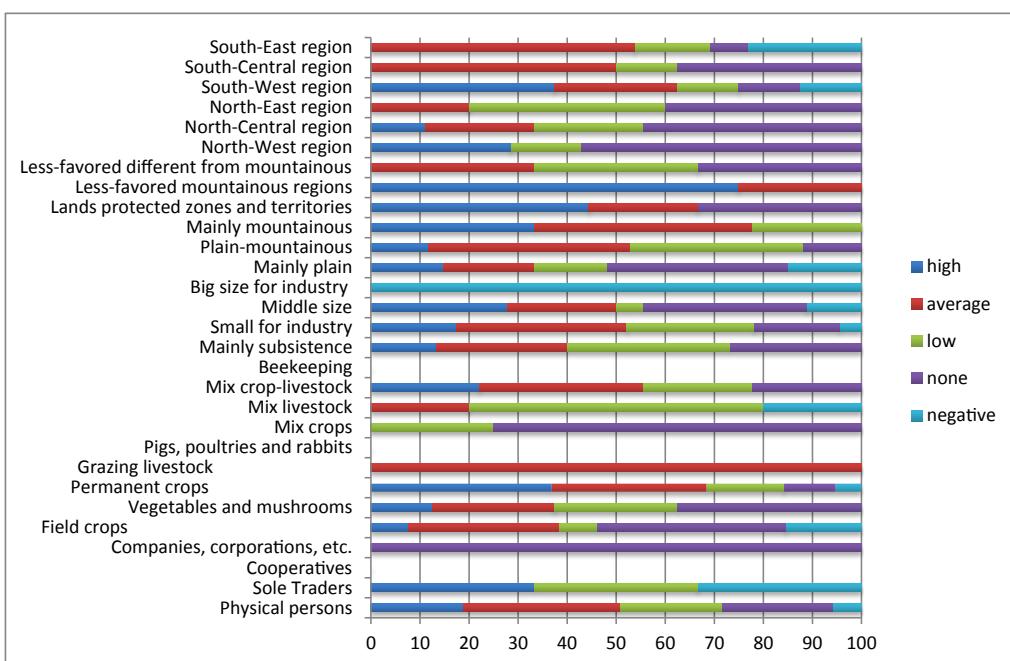
Diverse activities of the agricultural farms are associated with positive, negative or neutral impacts on the different components of the natural environment (soils, waters, air, biodiversity, climate, etc.). According to the majority of respondents to that question, the crop production activity of their farms is associated with “positive effects on soils quality” (86%) (Figure 18). A good part of the surveyed farms also believe that their crop production activity is associated with positive effects in terms of biodiversity (37,5%), air quality (27,1%), climate (21%), surface (18,3%) and ground (17,9%) waters, and landscape (15,7%).

In addition, the majority of respondents believe that, their crop production activity does not affect the climate (30,1%), ground (24%) and surface (22,3%) waters, and landscape (20,5%). Furthermore, a relatively small portion of the farms thinks that their crop production activity is associated with “negative effects” in relation to the different elements of the natural environment. The greatest is the share of the farms, which believe that their crop activity affects negatively the climate (6,5%), soils quality (5,7%), and surface waters (5,2%).



Source: Survey with agricultural producers, May 2014

Figure 16: Impact of measure 212 "Agro-environmental payments" of NPARD on supported farming enterprises of different type and location (percent).

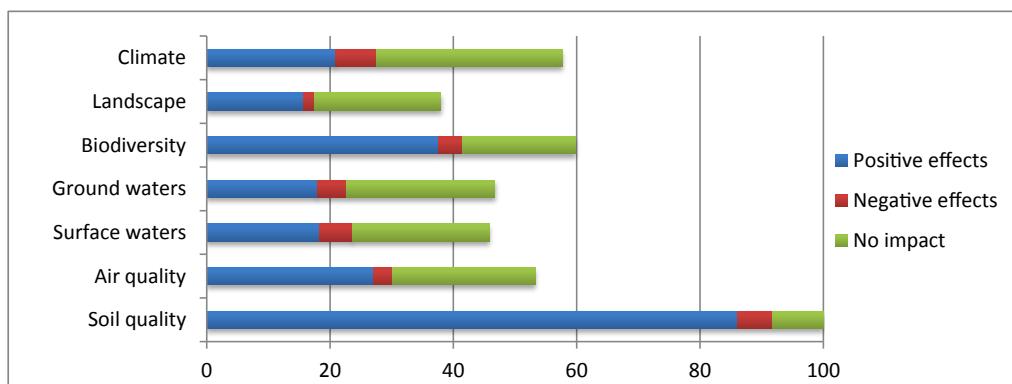


Source: Survey with agricultural producers, 2014

Figure 17: Impact of measure 211 "Natural handicap payments to farmers in mountain areas" of NPARD on supported farming enterprises of different type and location (percent).

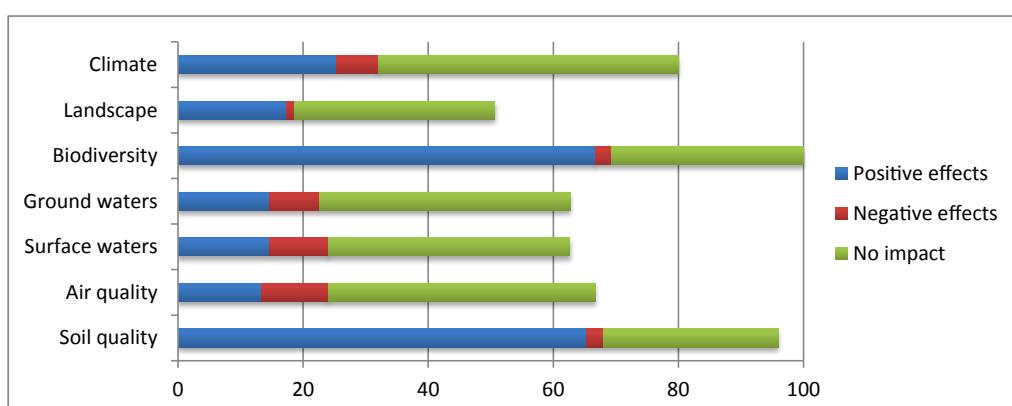
According to the most of the respondents, the livestock activity of their farms is associated with positive effects for biodiversity (66,7%) and soils quality (65,3%) (Figure 19). A good portion of the holdings also believe that this type of activity is associated with positive effects in relation to the climate (25,3%), landscape (17,3%), surface and ground waters (14,7%), and air quality (13,3%).

The majority of farms also suggest that their livestock activity does not affect the climate (48%), air quality (42,7%), ground (40%) and surface (38,7%) waters, and landscape (32%). However, a relatively big share of the holdings believes that their livestock activity is associated with "negative effects" in terms of air quality (10,7%), surface waters (9,3%), ground waters (8%), and climate (6,7%).



Source: Survey with agricultural producers, 2014

**Figure 18:** Impact of the crop activity of farming enterprises on individual components of natural environment (percent).



Source: Survey with agricultural producers, 2014

**Figure 19:** Impact of the livestock activity of farming enterprises on individual components of natural environment (percent).

According to a good part of surveyed farms, the overall activity of their farms is associated with positive effects in relation to soils quality (54,9%) and biodiversity (31,7%) (Figure 20). Also not so small fraction of the farmers believe that their activity has positive effects for the air quality (17,6%), climate (14,7%), surface and ground waters (13,4%), and landscape (11,4%).

Finally, the majority of the respondent farms to that question also think that their overall activity does not affect the climate, surface and ground waters, landscape and air quality-accordingly 22,2%, 17%, 16,7, 16,3 and 15,4% of the surveyed holdings. Only a small fraction of the surveyed farms believes that their overall activity is associated with negative effects related to the natural environment, and these is mostly true for the negative impact on climate and ground waters (4,2%).

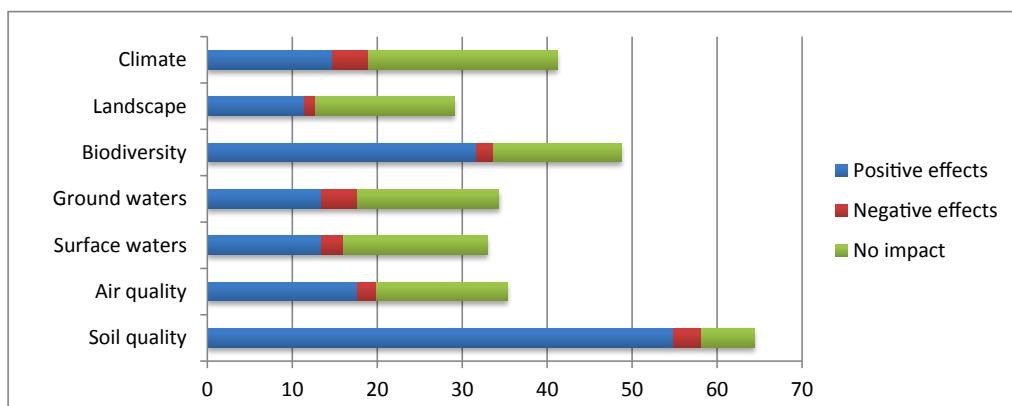
### Costs and efficiency of environmental activity

The eco-management in the agricultural farms is associated with inevitable augmentation of the production and the transaction costs of different type. For a big part of the surveyed farms their natural environment protection activity is connected with a "high" augmentation of long-term investments (23,5%), overall production costs (19,6%), expenditures for registration, tests, certification, etc. (19,6%), and specialized costs for the conservation of natural environment (19,3%) (Figure 21).

Also for the majority of farms, their eco-management is associated with "average" growth in the specialized costs for the protection of natural environment (40,8%), the overall production costs (38,9%), long-term investments (35,6%), costs for studying the official regulations and standards (33%), the overall management costs (32,3%), costs for acquiring information, training, and consultations (31,37%), costs for marketing of products and services (31%), costs for participation in the programs for public support (31,4%), costs for private negotiations and contracts (29,8%), costs for registrations tests, certifications, etc. (28,8%), costs for cooperation with others (25,8%), and the costs for resolutions of disputes and conflicts (23,2%).

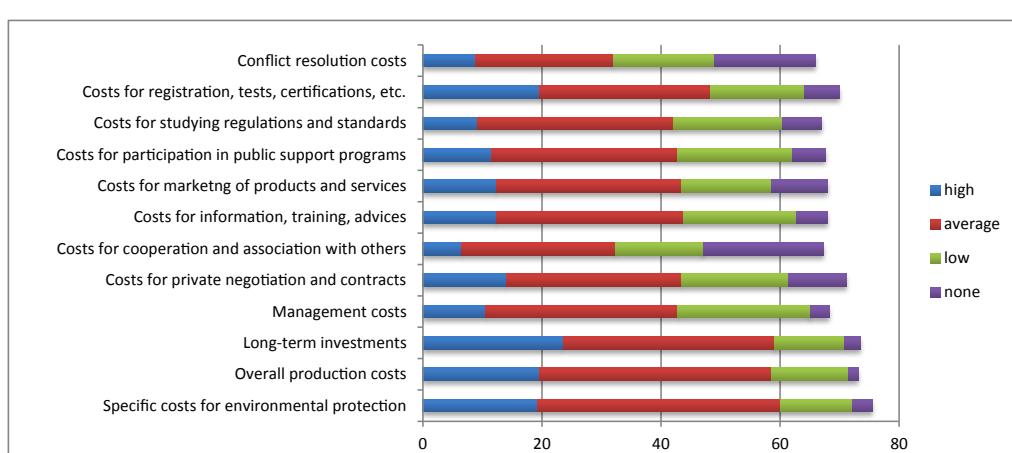
According to the predominate portion of the surveyed farms, their natural environment protection activity is also associated with the augmentation of farm economic efficiency, as for around one fifth of them that is to a "great" extent, for 37,8% in "average" extent, and for 9,1% of holdings in "insignificant" extent (Figure 22).

To the greatest extent the eco-activity of farms leads to increasing the economic efficiency for the Sole Traders (31,8%), the farms specialized in beekeeping (75%), mix livestock production (37,9%), and pigs, poultry and rabbits (33,3%), and the holdings located in less-favored mountainous regions (30%), and in the South-East (30,8%), North-Central (25%) and South-West (24%) regions of



Source: Survey with agricultural producers, 2014

**Figure 20:** Impact of the overall activity of farming enterprises on individual components of natural environment (percent).



Source: Survey with agricultural producers, 2014

**Figure 21:** Extent of augmentation of costs of farming enterprises associated with environmental protection activity (percent).

the country. At the same time, for a relatively greater portion of the farms specialized in grazing livestock (12,5%) and permanent crops (6,1%), the holdings with smaller size for the industry (7,3%), and those located in less-favored regions different from the mountainous, and in the South-East region of the country (10,3%), the eco-activity is not connected with any positive change in the economic efficiency. According to the majority of surveyed farms, their natural environment protection activity is also associated with the augmentation of ecological efficiency of the farm, as for 21,2% of them that is in a "high" extent, for 39,2% in "average" extent, and for 7,5% in "small" extent (Figure 23).

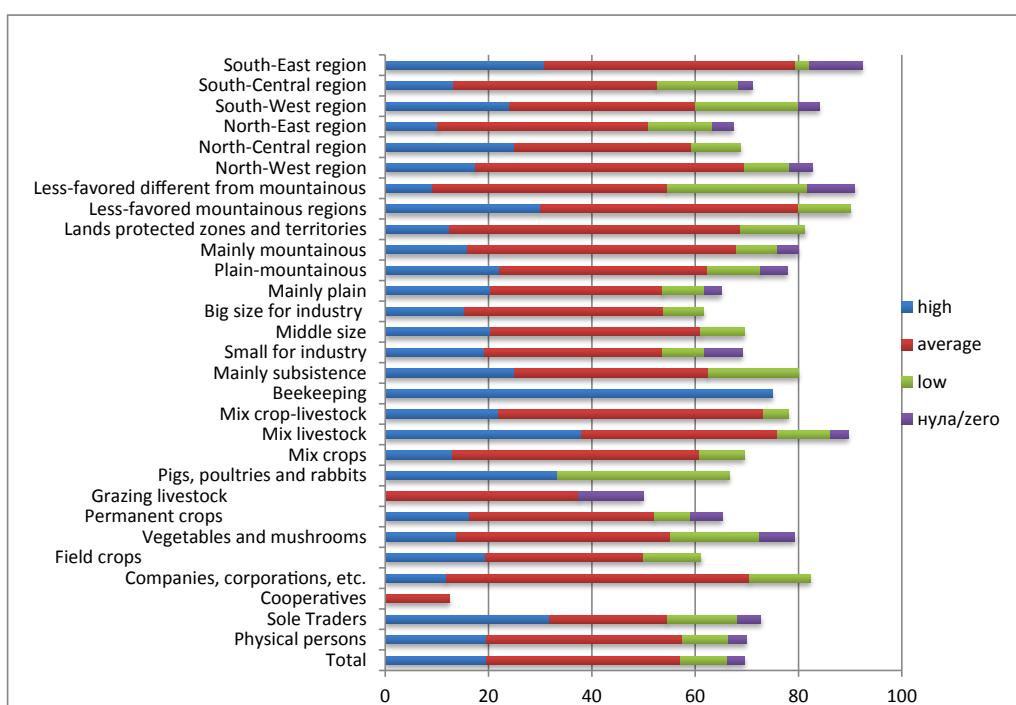
The eco-activity of farms leads to increasing in farm ecological efficiency for a relatively biggest portion of the farms specialized in beekeeping (75%), pigs, poultry and rabbits (33,3%), and mix crops-livestock production (31,7%), large-scale holdings (30,8%), and the farms located in less-favored mountainous regions (40%), those with lands in protected zones and territories (31,2%), and the farms in the North-East (30,4%) and the South-West (28%) regions of the country. On the other hand, for a good fraction of the holdings specialized in grazing livestock (12,5%), those located

in less-favored mountainous regions (9,1%) and with a small size for the industry (5,1%), the eco-activity is not connected with any change in the ecological efficiency.

### Perspectives of eco-management in farms

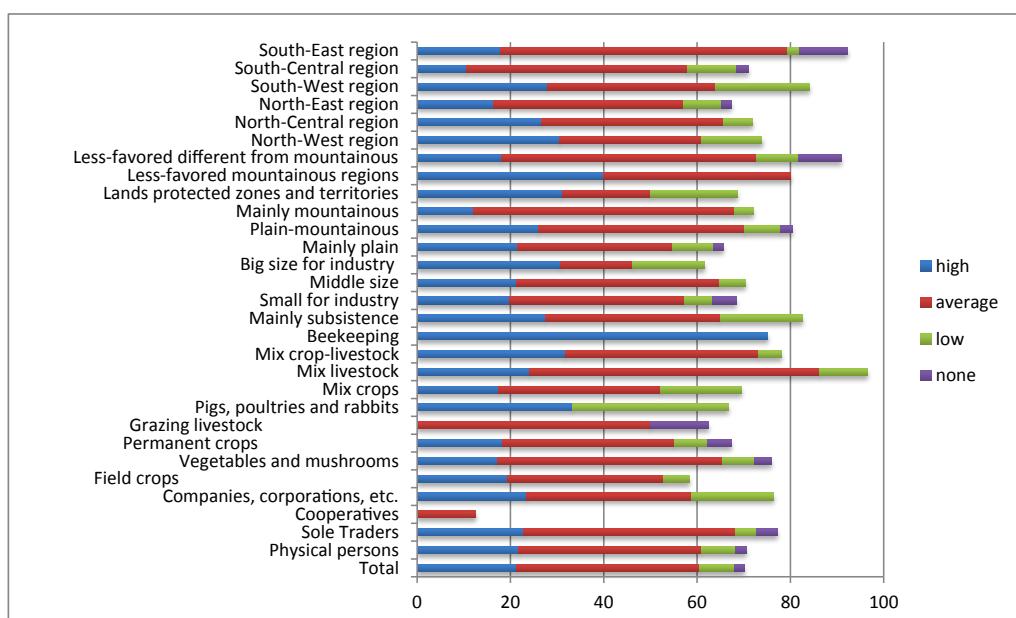
The eco-active farms are with various plans (intentions) for the eco-management in near future. The greatest part of the surveyed farms (43,8%) does not foresee any change in their eco-activity in the near future (Figure 24). However, a considerable fraction of them (31%) are having intentions to "expend the current eco-activities". At the same time, the share of farms, which are planning to restrict their current eco-activity is insignificant (1,3%).

In near future, a relatively great number of farmers are having intentions to "participate in the agro-environmental measures of the NPARD" (32%), for "eco-registration and certification" (16%), for "receiving the 'area-based green payments' from the EU" (13,7%), and for "introduction of new eco-products" (13,7%). Also a good portion of the farms are planning to "introduce new eco-services" (6,5%), "direct marketing of eco-products" (6,2%), and "participate in eco-cooperation with other farms" (5,5%). Furthermore, a relatively smaller fraction of the surveyed farms intend to "participate in eco-initiatives of other



Source: Survey with agricultural producers, 2014

Figure 22: Share of farming enterprises in which environmental protection activity is associated with increasing of economic efficiency (percent).



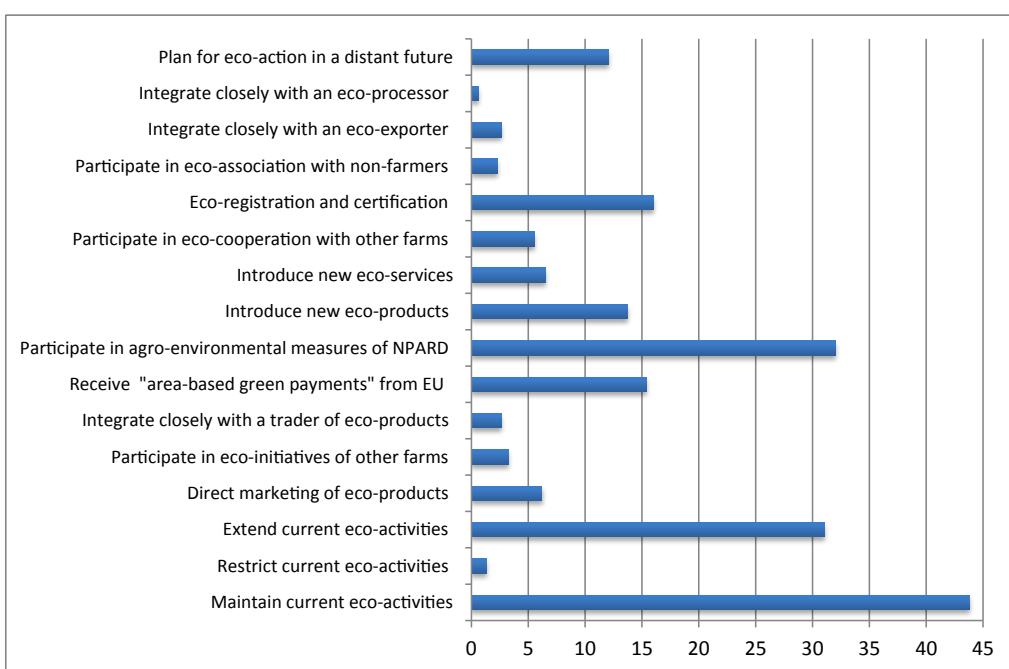
Source: Survey with agricultural producers, 2014

Figure 23: Share of farming enterprises, in which environmental protection activity is associated with increase in ecological efficiency (percent).

farms" (3,3%), "integrate closely with a trader of eco-products" (2,6%), "integrate closely with an eco-exporter" (2,6%), "participate in eco-association with non-farmers" (2,3%), and "integrate closely with an eco-processor" (0,6%). Besides, a considerable share of the farms (12,1%) indicates having a "plan for eco-actions in a more distant future".

## Conclusion

The first large-scale study on the forms, factors and the efficiency of eco-management in the "eco-active" farming enterprises in Bulgaria have found out that the structure of these holdings is similar to the country's with more massive presence of farms specialized in the



Source: Survey with agricultural producers, 2014

Figure 24: Share of farming enterprises with different intentions associated with natural environment protection in near future (percent).

permanent crops. Besides, the biggest part of the eco-active farmers is with a small “farming experiences” proving that the specific issue of the “eco-management” is new for most of the Bulgarian farms.

The majority of eco-active farms know and implements well the principles of eco-friendly agriculture. With the greatest internal knowledge capability are Cooperative farms, while for some Physical Persons the implementation of eco-principles is associated with certain conditions such as economic rationality, importance of the eco-actions, and existing environmental problem in the farm, a public contract, or a collection action with others. Good portions of the eco-active farms are certified or in a process of certification for the organic production, while others are with a plan for a bio-certification. Other market, private, and collective forms of eco-management (such as own or collective eco-label, protected origin, supply of eco and related services, establish good reputation, participation in diverse private, collective and public initiatives) are less frequently employed by the Bulgarian farms.

To the greatest extent the eco-activity of the eco-farms farms is stimulated by the personal conviction and satisfaction of the farmers from eco-activity, the participation in the public support programs, the received direct public subsidies, the professional eco-training of the farmer and the hired labor, the market competition, the access to the farm and eco-advises, the possibilities to increase profit, the co-benefits for your farm in the longer-term, and the European Union policies. On the other hand, the factors mostly restricting the eco-activities of farms are the amount of the direct costs for eco-friendly activity, the state control and sanctions, the state policies, the financial capability of the farm, the market demand and prices, the market competition, and the amount of costs for eco-cooperation.

The public support to the eco-active farms is higher than the average in the country for the farms of the similar type and location. The greatest fraction of these farms have been supported through

the Measure 214 “Agro-environmental payments” of the NPARD, the Directs Area-based payments from the EU, the Measure 141 “Semi-subsistence farming”, and the Measures 111, 114 and 143 “Professional training and advise”, the National tops-ups for products, livestock, etc., the Measure “Setting up of young farmers”, and the Measure 121 “Modernization of agricultural holdings”. For most beneficiaries the biggest impact on their farms have been caused by the Measures 111, 114 and 143 “Professional training and advices”, the Measure 214 “Agro-environmental payments”, the “Direct Area-based subsidies by the EU”, the Measure 112 “Setting up of young farmers”, the Measure 141 “Semi-subsistence farming”, the Measure 121 “Modernization of agricultural holdings”, the “National tops ups for products, livestock, etc.”, and the Measure 211 “Natural handicap payments to farmers in mountain areas”.

According to the good part of the eco-active farms, the overall activity of their farms is associated with positive effects to the soils quality and biodiversity. The majority of them also believe that their overall activity does not affect the climate, surface and ground waters, landscape and air quality. Only a tiny amount of the farms suggest that the overall activity is associated with negative effects to the nature, and that mostly concerns the negative impact on climate and ground waters.

For a big part of the eco-farms their environment protection activity is connected with a “high” augmentation of the long-term investments, the overall production costs, the expenditures for registration, tests, certification, etc. and the specialized costs for the conservation of natural environment. Furthermore, for the majority of farms, their eco-management is associated with “average” growth in the specialized costs for the protection of natural environment, the overall production costs, the long-term investments, the costs for studying official regulations and standards, the overall management costs, the costs for acquiring information, training, and consultations, the costs for marketing of products and services, the costs for participation in the programs for

public support, the costs for private negotiations and contracts, the costs for registrations tests, certifications, etc. the costs for cooperation with others, and the costs for resolutions of disputes and conflicts.

According to the greatest fraction of the eco-active farms, their environment protection activity is also associated with the augmentation of the economic and ecological efficiency of their holdings. The study conclude that it is to be given a special public support (training, information, funding, partnership, preferences, etc.) to the "eco-active" farms having a higher knowledge and applying greatly the principles of environmentally-friendly agriculture, which would induce (implement, demonstrate advantages, inspire and involve others, etc.) the overall improvement of the agro-eco-management in the country. Besides, more public support and inter-organizational cooperation (Ministry, Advisory system, farmers organization, academic institutions, etc.) is needed for carrying similar and wider studies using a multidisciplinary approach in order to better understand, identify and assess the forms, factors and efficiency eco-management in farms of different type.

## References

1. Baba A, Tayfur G, Gunduz O, Howard K, Friedel M, et al. (2011) Climate Change and its Effects on Water Resources. Issues of National and Global Security, Springer.
2. Bachev H (2008) Management of Environmental Challenges and Sustainability of Bulgarian Agriculture. In Environmental Challenges and Human Security: Recognizing and Acting on Hazard Impacts, Springer, New York.
3. COST (2009) COST Foresight 2030-Benefiting from the Digital Revolution. COST Workshop on Food Security, Gent, Belgium.
4. Defrancesco E, Gatto P, Runge F, Trestini S (2008) Factors Affecting Farmers' Participation in Agri-environmental Measures : A Northern Italian Perspective. *J of Agricultural Economics* 59: 114-131.
5. Dobbs T, Pretty J (2008) Case Study of Agri-environmental Payments: The United Kingdom. *Ecological Economics* 65: 765-775.
6. Ducos G, Dupraz P (2006) Private Provision of Environmental Services and Transaction Costs, Agri-Environmental Contracts in France. 3rd World Congress of Environmental and Resource Economics, Kyoto.
7. EC (2005) Strategy on the Sustainable Use of Natural Resources. European Commission, Brussels.
8. Farmer M (2007) The Possible Impacts of Cross Compliance on Farm Costs and Competitiveness. Institute for European Environmental Policy, KVL.
9. Hagedorn K (2002) Environmental Co-operation and Institutional Change: Theories and Policies for European Agriculture. Edward Elgar Publishing.
10. Hart R, Latacz-Lohmann U (2004) Combating Moral Hazard in Agri-Environmental Schemes: A Multiple-Agent Approach. *European Review of Agricultural Economics* 32: 75-91.
11. Mitchell B (2013) Resource & Environmental Management. Routledge, New York.
12. Peerlingsa JHM, Polman NBP (2009) Farm Choice Between Agri-Environmental Contracts in the European Union. *Journal of Environmental Planning and Management* 52: 593-612.
13. Reed M (2008) Stakeholder Participation for Environmental Management: A Literature Review. *Biological Conservation* 141: 2417-2431.
14. Scorzari A, Mansouri B (2011) Water Security in the Mediterranean Region. An International Evaluation of Management, Control, and Governance Approaches, Springer.
15. UN (2012) Report of the United Nations Conference on Sustainable Development. Rio de Janeiro, UN.
16. Bachev H (2009) Governing of Agro-ecosystem Services. Institute of Agricultural Economics, Social Science Research Network.
17. Bachev H (2010) Governance of Agrarian Sustainability. Nova Science Publisher, New York.
18. Bachev H (2013) Management Strategies for Conservation of Natural Resources in Agriculture. Institute of Agricultural Economics, Social Science Research Network.
19. Mitova D, Toteva D (2013) Analysis and Assessment of Impact Of EU CAP On Organic Agriculture. In Cereals and Oil Crops in the Conditions of CAP, IAE.
20. Yovchevska P (2012) Ecological code of the new CAP and the agricultural producer. *Economic Studies* 3: 25-34.