

## Assessing governance aspect of agrarian sustainability in Bulgaria

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### Abstract

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In Bulgaria practically there are no comprehensive assessments of the “newly” suggested governance pillar of agrarian sustainability. This article tries to fill the gap and present a holistic framework for understanding and assessing the governance sustainability of Bulgarian agriculture. The novel system for sustainability evaluation comprising 5 Principles 19 Criteria, and 22 Indicators and References Values is applied in a large-scale study for assessing the governance sustainability at national, sectoral, regional, eco-system and farm levels. Multi-dimensional assessment indicates that the Overall Governance Sustainability of Bulgarian agriculture is at “Good” but very close to “Satisfactory” level. There is a considerable differentiation in the levels and critical factors of Integral Governance sustainability of agro-systems of different type. Results on the integral agrarian sustainability assessment based on micro (farm) and macro (statistical, etc.) data show some discrepancies which have to be taken into consideration in the analysis and interpretation, while assessment indicators, methods and data sources further improved.

*Keywords:* governance sustainability; assessment; agricultural systems; Bulgaria

### Introduction

A common feature of all suggested and used modern systems for assessing sustainability of agro-systems is incorporation of three pillars framework (Bachev et al., 2017, 2019; Cruz et al., 2018; EC, 2001; FAO, 2013; Hayati et al., 2010; Kamalia et al., 2017; Lopez-Ridaura et al., 2002; Mykhailova et al., 2018; OECD, 2001; Sauvenier et al., 2005; Terziev et al., 2018). In the past several years a need to include a new (“fourth”) Governance pillar in the sustainability concept and assessment system has been increasingly justified in academic literature (Bachev et al., 2018; Baeker, 2014; Burford, 2017; Bhuta & Umbach, 2014; Monkelbaan, 2018; Spangenberg et al., 2002) and find place in documents of government, international, professional etc. organizations (Ganev et al., 2018; EU, 2019; IFAD, 1999; Kayizari, 2018; Simberova et al., 2012; Scobie & Young, 2018; UN, 2015).

Despite enormous progress in that novel direction, the building of a system for understating and assessing the governance aspect of agrarian sustainability is a “work in progress”. Most approaches are at conceptual and/or “qualitative” level. The few existing systems are focusing entirely on national and international level (comparison) without taking into consideration multiple levels of governance, and specificity of agriculture of agri-(sub) systems. Often, governance aspect of agrarian and farm sustainability are wrongly identified. All suggested and used systems for governance sustainability assessment contains a list of “universal” indicators equally applicable for the unique socio-economic, market, institutional, natural, etc. conditions of individual country. Evaluation of governance sustainability is usually restricted to formal institutional environment and/or “official” public modes without taking into account important market, private, collective, and hybrid forms, and vast “informal” governance. Individual in-

dicators of governance (and overall) sustainability are (pre) determined by “arbitrary” selection while specific “reference values” not incorporated in the assessment framework. Generally, there is no system (approaches, priorities, weights, interpretation modes) for the “integration” of sustainability indicators into an Integral governance and sustainability level. Most proposed systems of sustainability assessment cannot be practically used at different decision-making levels since they are very complex and difficult to understand, calculate, monitor, correctly interpret and used in everyday activity.

In Bulgaria, there are very few attempts to analyze the governance aspect of agrarian sustainability and incorporate it into overall sustainability assessment (Bachev, 2017; Bachev et al., 2018; Treziev et al., 2018; Marinov, 2019). This study tries to fill the gap and suggests a holistic framework for understanding and assessing the governance sustainability of Bulgarian agriculture. The newly elaborated approach is applied in a large-scale study for assessing the governance sustainability of country’s agriculture at national, sectoral, regional, eco-system and farm levels, and its contribution to the overall sustainability of Bulgarian agriculture.

## Material and Methods

“Governance sustainability” characterizes the efficiency of the specific system of governance in a particular agro-system being national, subsector, ecosystem, regional, farming enterprise, etc. Accordingly, “good governance” means superior governance sustainability, while “bad” (inefficient) governance corresponds to inferior governance sustainability (Bachev et al., 2018). The system of governance includes a number of district mechanisms and modes all of which have to be included in the sustainability assessment: *institutional environment* (“rule of the game”), and *market* (“invisible hand of market”, “market order”), *private* (“private or collective order”), and *public mechanisms and modes*.

Agriculture consists of many agro-systems – from individual “farming plot”, a “farm enterprise”, an “agri-ecosystem”, an “agro-region”, up to a “national”, “European” and “global”. This study focuses on the assessment of (governance) sustainability at national level and for principle agricultural systems in Bulgaria – major type of farming organizations, subsectors of agriculture, agro-ecosystems, and administrative (agro) regions. A special distinction is made between the governance sustainability of agriculture and sustainability of “governance” structures in agriculture.<sup>1</sup>

In order to identify the individual sustainability indicators a hierarchical system of well-determined Principles, Criteria, Indicators, and Reference Values for each Aspect (Pillar) of sustainability is elaborated (Table 1). Detailed justification of that *new* approach, and the ways for selection of sustainability Principles, Criteria, Indicators and Reference Values are presented in other publications by Bachev (2017), and Bachev et al. (2017, 2018).

Individual Indicators are usually with unequal, and frequently with controversial levels. Therefore, diverse quantitative and qualitative levels for each indicator are transformed into Index of sustainability applying appropriate scale for each Indicator (Bachev et al., 2018). Integral Sustainability Index for a particular Criterion, Principle, and Aspect of sustainability, and Integral Sustainability Index for evaluated agro-system is calculated applying “equal weight” for each Indicator in a particular Criterion, of each Criterion in a particular Principle, and each Principle in every Aspect of sustainability. Using “equal” rather than differentiated weight is determined by the fact that individual Sustainability Aspects and Principles, are “by definition” equally important for the Integral Agrarian Sustainability. Differentiation of individual Criteria and Indicators weights within each Principle and Criteria is difficult to justify and practically unimportant (big number and small relative contribution of Integral Index).

For assessing the level of Governance and Integral sustainability of agro-systems following scale are used: Index range 0.81-1 for a “High” level of sustainability; 0.5-0.8 for “Good” level; 0.26-0.49 for “Satisfactory” level; 0,06-0,25 for “Unsatisfactory” level; 0-0.05 for “Non-sustainable” state (Bachev et al., 2018).

Elaborated novel framework is applied using experts and stakeholders assessments, and 2018 survey data with managers of 104 “typical farms” of different size and juridical type, production specialization, and ecological and geographical locations. Classification of farms into juridical type, size, production specialization, and ecological and geographical location is done according to the official definitions currently used in Bulgaria (and European Union).

In Bulgaria, like in many other countries, there are no official data for calculating most of the governance, socio-economic and environmental sustainability indicators at lower (farm, eco-system, subsector, regional, etc.) level. Therefore, micro and middle level assessment of socio-economic, environmental and governance sustainability is entirely based on the “original” first-hand information collected from the farm

<sup>1</sup> While sustainability of certain type of farms (family holding) is included as major criteria for assessing “social” pillar of agrarian sustainability, sustainability level of different type of farms, admin-

istrative bodies, etc. is not a part of evaluation - sustainable development is commonly associated with adaptation, liquidation, restructuring and modernization of farming enterprises and agrarian.

**Table 1. System for assessing governance sustainability of Bulgarian agriculture**

Principles	Criteria	Indicators		Reference values	
		Sectoral level	Farm level	Sectoral level	Farm level
Good legislative system	Harmonization with EU policies	Extent of policies harmonization	na	Experts estimate	
	Extent of EU policies implementation	Extent of financial implementation of policies	Extent of CAP implementation	Experts estimate	Beneficiaries estimates
		Extent of achievements of objectives indicators		Experts estimate	
	Beneficiaries' satisfaction of EU policies	Extent of beneficiary satisfaction of EU policies	Extent of beneficiary satisfaction of EU policies	Beneficiaries estimates	Beneficiaries estimates
	Policies effects	Coefficient of subsidies distribution from Pillar 1	Level of subsidies comparing to the average for the sector	High 0-0,25 Good 0,26-0,45 Satisfactory 0,46-0,6 Unsatisfactory 0,61-0,8 Unsustainable 0,81-1,0	Average for the sector
		Coefficient of distribution of investment support comparing to share in Net Value Added			
Democratic management	Representation	Share of producers represented in different public decision-making bodies	Producers' representativeness in state and local authorities	Experts estimate	Farm managers estimates
	Transparency	Transparency level	Level of access to information	Experts estimate	Farm managers estimates
	Impact	Share of overall support Net Value Added of agriculture	Share of subsidies in income	High 41-100% Good 26-40% Satisfactory 11-25% Unsatisfactory 6-10% Unsustainable below 5%	High 41-100% Good 26-40% Satisfactory 11-25% Unsatisfactory 6-10% Unsustainable below 5%
		Level of subsidizing in Net Income			
Stakeholders' participation in decision-making process	K of real weight in the process	Farmers' participation in decision-making	Experts estimate	Farm managers estimates	

Table 1. Continued

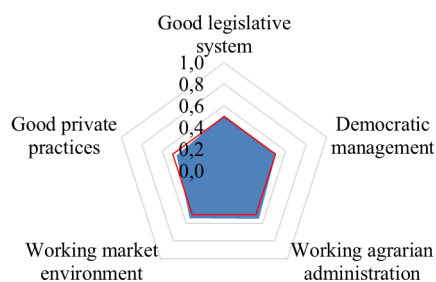
Working agrarian administration	Minimum costs of using	Legitimate payments	Acceptability of legal payments	Beneficiaries estimates	Farm managers estimates
		Non-legitimate payments		Beneficiaries estimates	
	Access to administrative services	Share of digitalized services in overall number	Administrative services digitalization	Experts estimate	Farm managers estimates
			Agrarian administration efficiency		
	Information availability	Level of awareness	Extent of awareness	Beneficiaries estimates	Farm managers estimates
Quality of services	Administration costs in Value Added of Agriculture	Administration service costs	High 0-0,01 Good 0,2-0,05 Satisfactory 0,05-0,1 Unsatisfactory 0,11-0,2 Unsustainable Bigger than 0,2	Farm managers estimates	
Working market environment	Market access	Extent of market access	Market access difficulties	Experts estimate	Farm managers estimates
	Free competition	Extent of price influence	Prices negotiation possibilities	Experts estimate	Farm managers estimates
			Market competition		Farm managers estimates
	Competitive allocation of public resources	Extent of competitive distribution	Extent of competitive allocation of public resources	Experts estimate	Farm managers estimates
		Possibilities for taking part in public procurements		Experts estimate	Farm managers estimates
	Resource concentration	K of concentration of land resources	K of lands concentration	High bellow 200 xa Good 200-400 xa Satisfactory 400-600 xa Unsatisfactory 600-800 xa Unsustainable above 1000 xa	High bellow 200 xa Good 200-400 xa Satisfactory 400-600 xa Unsatisfactory 600-800 xa Unsustainable above 1000 xa
Real possibilities of lands extension				Possibility for lands extension	Experts estimate
Good private practices	Regulation implementation	Extent of regulations implementation	Extent of regulations implementation	Experts estimate	Farm managers estimates
	External control	Control regulation	Management Board external control	Experts estimate	Farm managers estimates
	Correctness of relationships	Extent of contract enforcement	Extent of contract enforcement	Experts estimate	Farm managers estimates
	Efficient informal system	Level of informal system efficiency	Level of informal system efficiency	Experts estimate	Farm managers estimates

Source: authors

managers. The composite (Aspect and Integral) Sustainability Index of each evaluated agri-system is calculated as an arithmetic average of Indices of relevant farms belonging to that system. Assessment of the Governance sustainability at national (sectoral) level is evaluated in two ways – using experts and stakeholders (farmers, producers' organizations, etc.) estimates, and though aggregation of information from farms survey.

## Results and Discussion

A multiple indicators' assessment of the Governance sustainability level of Bulgarian agriculture based on micro (farm survey) data indicates that the Index of Overall Sustainability is 0.51 - this represents a close to the lower ("Satisfactory") but still a "Good" level of Governance sustainability (Figure 1). Analysis of individual Indices for primary sustainability Principles, Criteria, and Indicators allows identifying individual components contributing to the Governance sustainability of this important sector of Bulgarian economy. For instance, the Governance sustainability of Bulgarian agriculture is relatively low because the Index for the Principle "Good Private Practices" is at "Satisfactory" level (0.46) and compromises the Pillar's Integral sustainability. Moreover, Indices for "Good Legislative System" and "Democratic management" are quite low and at the border with the "Satisfactory" level – 0.5 and 0.51 accordingly. At the same time, Indices for the Principles "Working agrarian administration" (0.55) and "Working market environment" (0.54) are highest and contribute most for elevating (ensuring) the Governance Sustainability of the sector.

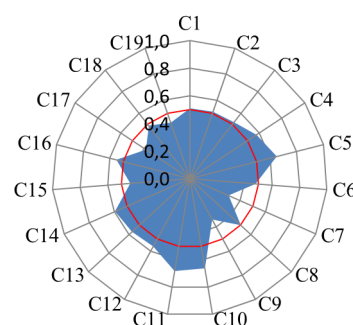


**Fig. 1. Indices of sustainability for major principles of governance sustainability of Bulgarian agriculture**

Source: farms survey, authors calculation

In depth analysis of the levels of the individual Criteria and Indicators further specifies the elements that enhance or reduce country's agricultural Governance sustainability. For instance, the insufficient "Good Private Practices" is de-

termined by the low "External control" (over management) (0.38), weak "Contracts enforcement" (0.49) and inferior "Informal system efficiency" (0.43) (Figure 2). Similarly, despite that the Integral Index for "Democratic management" Principle is at a "Good" level, Indices for two criteria (policies) "Impact" and "Stakeholder participation in decision-making" are quite low at satisfactory territory. Likewise, "Working agrarian administration" seems "Good" but "Access to administrative services" is actually very low (0.34) at "Satisfactory" sustainability level. The same is true for the "Working market environment" which is "Good" while Index for the Criteria "Resource concentration" reveals low sustainability (0.43).



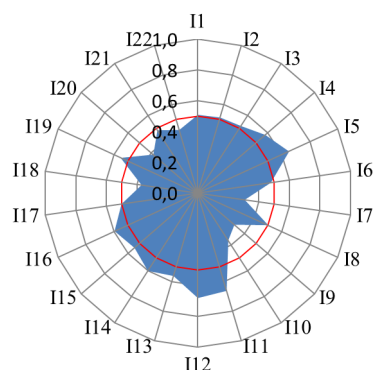
**Fig. 2. Indices of sustainability for major criteria\* of governance sustainability of Bulgarian agriculture**

\*C1-Extent of policies implementation; C2-Extent of beneficiary satisfaction of EU policies; C3-Policies effects; C4-Representation; C5-Transparency; C6-Impact; C7-Stakeholder participation in decision-making; C8-Minimum costs of using; C9-Access to administrative services; C10-Information availability; C11-Quality of services; C12-Market access; C13-Free competition; C14-Competitive allocation of public resources; C15-Resource concentration; C16-Regulation implementation; C17-External control; C18-Contracts enforcement; C19-Informal system efficiency

Source: farms survey, authors calculation

Individual sustainability Indicators give precise information about the specific factors determining one or another values of a particular Criteria. For example, ineffective "Access to administrative services" is determined accordingly by the insufficient "Agrarian administration efficiency" and undeveloped "Administrative services digitalization" (Figure 3). Likewise "Satisfactory" sustainability for the "Resource concentration" is a consequence of the (low) "Possibility for lands extension".

The low values for the Indicators help identify specific areas that require improvement through adequate changes in the institutional environment, public policy, modernization of agrarian administration, collective actions and/or manage-



**Fig. 3. Indicators\* for assessing the governance sustainability of Bulgarian agriculture**

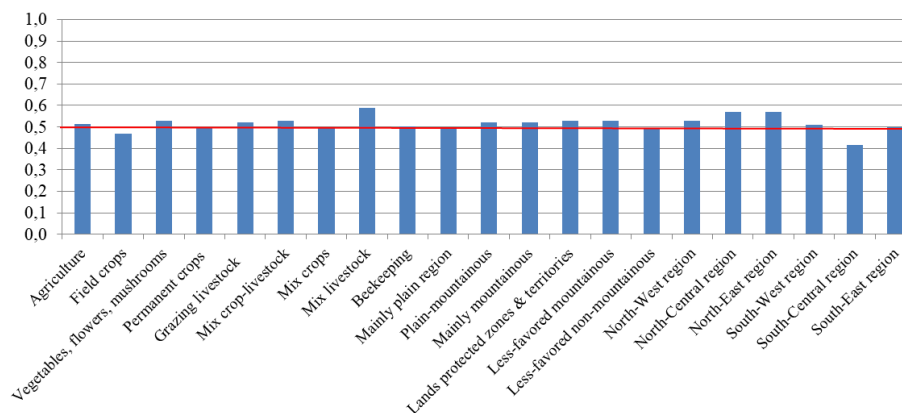
\* I1-Extent of CAP implementation; I2-Extent of beneficiary satisfaction of EU policies; I3-Subsidies distribution; I4-Representativeness of state and local authorities; I5-Access to information; I6-Subsidies in Income; I7-Farmer's participation in decision-making; I8-Acceptability of legal payments; I9-Agrarian administration efficiency; I10-Administrative services digitalization; I11-Extent of awareness; I12-Administration service costs; I13-Market access difficulties; I14-Market competition; I15-Prices negotiation possibilities; I16-Extent of competitive allocation of public resources; I17-Lands concentration; I18-Possibility for lands extension; I19-Extent of regulations implementation; I20-Management Board external control; I21-Extent of contract enforcement; I22- Level of informal system efficiency.

Source: survey with farm managers, author's calculation

ment strategies. At the current stage of the development the most critical for increasing the Governance sustainability of country's agriculture are progressive improvements in following directions: Farmer's participation in decision-making, Agrarian administration efficiency, Administrative

services digitalization, Possibility for lands extension, Management Board external control, Level of informal system efficiency, Subsidies in Income, Extent of contract enforcement, Acceptability of legal payments, and Lands concentration. The higher levels of certain Indicators show the absolute and comparative advantages of the Bulgarian agriculture in terms of good governance and sustainable development. At the current stage of development, the most prominent of these include: Representativeness of state and local authorities, Market competition, Extent of competitive allocation of public resources, Access to information, Extent of awareness, and Administration service costs. Nevertheless, the top value(s) of the Governance sustainability Indicators in Bulgarian agriculture is relatively low. Therefore, there is a great potential for improvement of governance efficiency and further elevate the Governance and Overall sustainability.

The analysis of the Governance sustainability of different sub-sectors of Bulgarian agriculture shows that there is a great variation in the sustainability level. The highest ("Good") level of Governance sustainability is demonstrated in the "Mix livestock" production, followed by the "Vegetables, flowers, mushrooms" and "Mix crop-livestock" sectors (Figure 4). Therefore, these three subsectors contribute to greatest extent for improving (maintaining) the overall Governance sustainability of Bulgarian agriculture. On the other hand, the level of Governance sustainability in the "Grazing livestock", "Permanent crops", and "Beekeeping" is close to the average in the sector. Finally, in some major subsectors like "Field crops" and "Mix crops", the level of the Governance sustainability is "Satisfactory" and far below the general one. This means that the later subsectors decrease in a biggest degree the Integral Governance sustainability of country's agriculture.



**Fig. 4. Governance sustainability in different sub-sectors of agriculture, agri-ecosystems and agrarian regions of Bulgaria**

Source: survey with farm managers

The different sub-sectors of Bulgarian agriculture are characterized by significant variation of the levels of Indices of the main Principles of the Governance sustainability (Figure 5). For instance, the Principle “Good legislative system” is the best realized in the “Vegetables, flowers, mushrooms” production and “Mix-livestock” operations, and the worst in “Field crops” and “Grazing livestock” sub-sectors. The Principle of “Democratic management” is the best applied in the “Mix livestock” production, while it is not “Satisfactory” in the “Beekeeping” and “Mix crops” and “Mix crop-livestock” sub-sectors. The interior and superior levels of the Governance sustainability for particular Principles show the directions for improving the Governance sustainability in the relevant sub-sectors of agriculture.

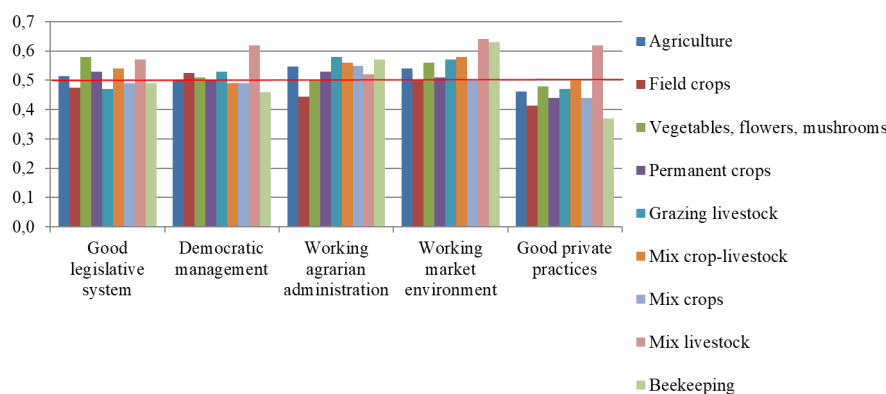
The Principle “Working agrarian administration” is effectively applied in “Beekeeping”, and “Grazing livestock” and “Mix crop-livestock”, while agrarian administration does not “work” well in the sector of “Field crops”. The sustainability for the Principle “Working market environment” is the highest in “Mix livestock”, “Beekeeping” and “Mix crop-livestock”. Simultaneously, market mechanisms are not working very well for the “Field crops” producers. Finally, “Good private practices” are the best implemented in the subsector of “Mix livestock” and “Mix crop-livestock”, while in all other subsectors they are applied only “Satisfactorily”, being particularly inferior in the “Beekeeping” and “Field crops”.

In depth analysis of that type identifying inferior (critical) levels for sustainability Principles has also a high practical value since they show the specific directions (public, collective and private action areas) for improving the particular (Principle) and the Integral Governance sustainability in the evaluated subsector and agriculture in general. Further anal-

ysis of the sustainability level for the individual Indicators allows “complete” unpacking the “critical” factors enhancing and/or decreasing the Governance sustainability of each sub-sector.

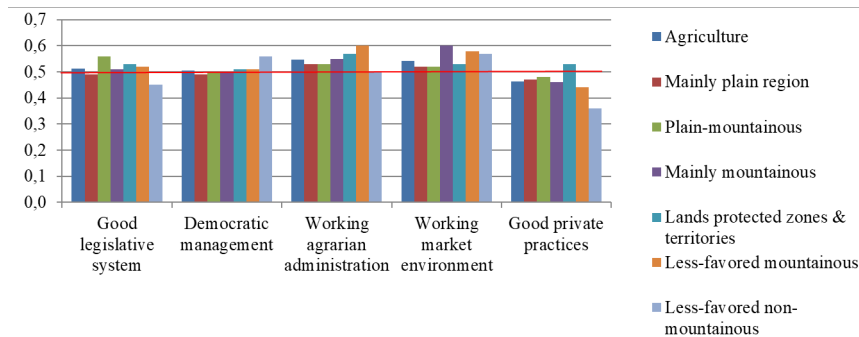
The Governance sustainability of major agro-ecosystems in Bulgaria also demonstrates a great variation as the highest (“Good”) ones are registered for the agro-ecosystems with “Lands in protected zones and territories” and those in “Less-favored mountainous” regions (Figure 4). At the same time, the Governance sustainability of two agro-ecosystems – “Mainly plain” and “Less-favored non-mountainous” are below the national (sectoral) average, the second one being at inferior (“Satisfactory”) level. Therefore, the latter two types of agro-ecosystems decrease to the biggest extent the Integral Governance sustainability of Bulgarian agriculture.

The different agro-ecosystems of the country are further characterized by significant differentiations in the levels of Indices of main Principles of the Governance sustainability (Figure 6). The principle “Good legislative system” is the best implemented at “Good” level in the “Plain-mountainous” agro-ecosystems, while in the “Less-favored non-mountainous” and “Mainly plain” regions it is at “Satisfactory” level. On the other hand, the principle of “Democratic management” is the best realized in “Less-favored non-mountainous” agro-ecosystems, in the most other type it is the same or close to the sectoral average, and in the “Mainly plain” regions it is at “Satisfactory” level. Furthermore, the principle “Working agrarian administration” is better applied in the agro-ecosystems in “Less-favored mountainous” regions, those with “Lands in protected zones and territories”, and in “Mainly mountainous” regions while in all other types it is in below the national level. Similarly, the Principle “Working market environment” is with the highest value



**Fig. 5. Indices of the principles of governance sustainability in major sub-sectors of Bulgarian agriculture**

Source: farms survey, authors calculation



**Fig. 6. Indices of the principles of governance sustainability in major agri-ecosystems in Bulgaria**

*Source: survey with farm managers*

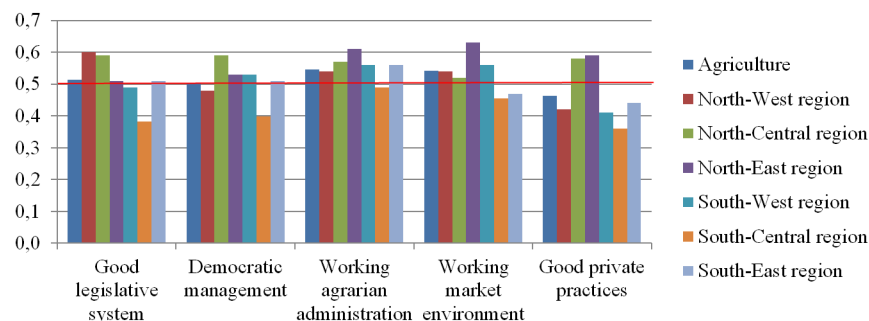
in the agro-ecosystems in “Mainly mountainous” regions, “Less-favored mountainous” regions, and “Less-favored non-mountainous” regions, while in other agro-ecosystems it is worse than national one. Finally, the Governance sustainability for the Principle “Good private practices” is best implemented in the “Lands protected zones and territories”, while in all other agro-ecosystems it is at “Satisfactory” level, being far worse than the sectoral average in the “Less-favored non-mountainous” regions.

There is a significant variation in the different aspects of Governance efficiency among administrative (and agricultural) regions of the country. The Principle of the Governance sustainability “Good legislative system” dominates in the “North-West region” and “North-Central region”, while in the “South-Central region” and “South-West region” it is only applied “Satisfactorily” (Figure 7).

The Principle of “Democratic management” is the best realized in the “North-East region” and “South-West region”, and insufficiently in the “South-Central region” and “North-West region”. The Principle “Working agrarian administration” is effectively applied in the “North-East region” and “North-East region”. Simultaneously, that Principle is “Sat-

isfactory” applied in the “South-Central region”. Similarly, the Principle “Working market environment” are highly regarded in the “North-East region” while in the “South-Central region” and “South-East region” is inferior. Finally, the “Good private practices” are the best carried out in the “North-Central region” and “North-East region” while in the three south regions of the country they are enforced “Satisfactorily”.

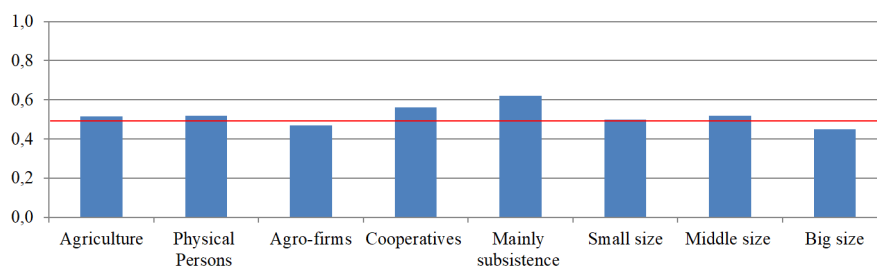
Last but not the least important, our approach let us assess what is the Governance sustainability for the various farming structures in the country, and how dominating institutional environment and modes of governance affect (contribution toward) sustainable development of major type of Bulgarian farms. The system of governance of Bulgarian agriculture does not impact equally farms with different juridical type and size of operations. The Governance sustainability of agriculture is the highest for the “Semi-market” (“Mainly subsistence farms”) and “cooperative” (“Cooperatives”) sectors – the Integral Governance Sustainability Index for this type of farming organizations is much higher than the sectoral average (Figure 8). Other main juridical type of farms like “Physical Persons” and the “Middle size”



**Fig. 7. Indices of the principles of governance sustainability in agro-regions in Bulgaria**

*Source: survey with farm managers*





**Fig. 8. Governance sustainability for major type of farming organizations in Bulgaria**

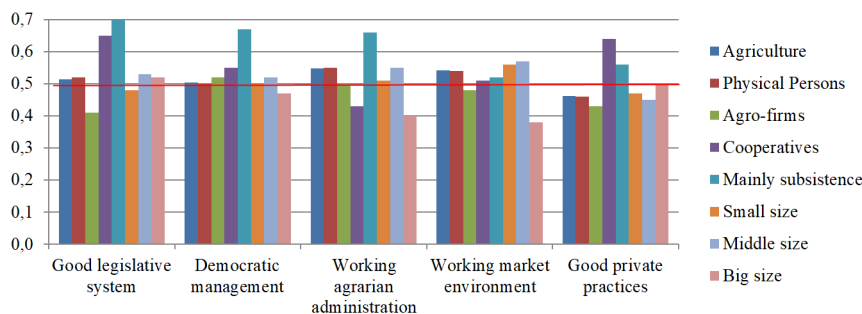
Source: survey with farm managers

farming enterprises also have higher than the average Governance Sustainability Index. Therefore, all these four types of farming organizations contribute to the greatest extent to increasing (maintaining) the “Good” Governance sustainability of Bulgarian agriculture. At the same time, for the “Small size” farms the Governance sustainability is below the national one and at the border with the “Satisfactory” level. Furthermore, for the “Agro-firms” and “Big size” farming enterprises the Governance sustainability is at “Satisfactory” level. Consequently, this major type of farming enterprises diminishes to the greatest extent the overall Governance sustainability of country’s agriculture.

The main Principles of the Governance sustainability are applied (“work”) differently in relations to various types of Bulgarian farms. The Governance Sustainability Principles “Good legislative system”, “Democratic management” and “Good private practices” the most favorably affect the “Cooperatives” and “Mainly subsistence” farms (Figure 9). The Governance Sustainability Principle “Working agrarian administration” is the most effectively implemented in regards to “Mainly subsistence” holdings. “Physical Persons” and “Middle size farms”. The Governance Sustainability Principle “Working market environment” is more favorable for the “Middle size” and “Small size” farms. On the other hand,

the individual Principles for the Governance sustainability of agriculture are worse applied in and adversely impact different type of farms. The Sustainability for the “Good legislative system” Principle is at “Satisfactory” level for the “Agro-firms” and “Small size” farms. The sustainability Principle “Democratic management” is at “Satisfactory” level only for the “Big size” farming enterprises. Implementation of the Principle “Working agrarian administration” is inferior (“Satisfactory”) for the “Big size” farms and “Cooperatives”; the sustainability Principle “Working market environment” does not work well for the “Big size” farms and “Agro-firms”; and “Good private practices” are not applied sufficiently and badly affect “Agro-firms”. “Middle size” farms, “Physical Persons”, and “Small size” holdings.

The comprehensive assessment of the Governance sustainability of the Bulgarian agriculture by using aggregate (sectoral) and farming (survey) data shows quite unlike results – “Satisfactory” level in the former case, and (close to the border with “satisfactory” but still) a “Good” level in the latter case (Figure 10). The Overall and Principles sustainability estimates based on the farm manager’s assessments are higher than those calculated on the base of the official (statistical, FADN, etc.) information and experts estimates (Figure 11). The discrepancies in the estimates for three



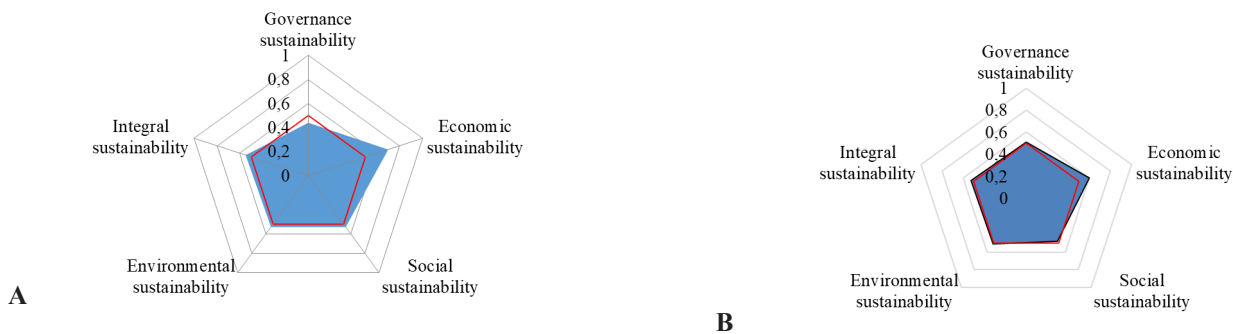
**Fig. 9. Indices of the principles of governance sustainability for major type of Bulgarian farms**

Source: survey with farm managers

Principles (“Democratic management”, “Working market environment”, and “Good legislative system”) are crucial since they put the Governance sustainability in different (inferior) levels. Therefore, Governance sustainability assessments always have to be based both on (complementary) macro and micro data in order to increase accuracy and extend reliability. Besides, theoretical and practical work for the improvement of the assessment methods and data sources of the sectoral sustainability assessments (especially as far as the Governance Pillar is concerned) is to continue.

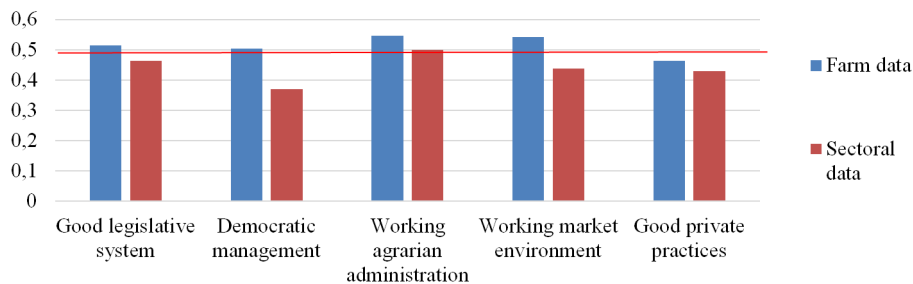
The inclusion of the “Governance Aspect” in the sustainability calculations changes the Integral Sustainability Index of Bulgarian agriculture using sectoral (with 0.03), and to a smaller extent farm (with 0.005) based estimates (Figure 12). However, taking into account the Governance aspect does not modify the overall (“Good”) sustainability level using both type of information. The latter is due to the fact that there are also differences in the Sustainability Indexes

for the Economic, Social and Environmental aspects based on the aggregate (sectoral) and aggregated first hand farm data (Figure 10), being particularly high for the Economic and Social sustainability (0.1 and 0.05 accordingly). The estimates based on the official aggregate sectoral data for the Economic, Social and Environmental aspects are higher than the corresponding levels based of micro farm data. Consequently, they do not affect the Integral sustainability “compensating” the contribution to the overall sustainability level of the Governance pillar. Nevertheless, the inclusion of the missing “new” and important Governance aspect is crucial since it ameliorates adequacy and precision of the sustainability assessment of Bulgarian agriculture. At the same time, all dynamics and discrepancies in the estimates between sustainability pillars and the estimates based of different (statistical, farm, etc.) type of data have to be taken into consideration in the analysis and the interpretation of results, while assessment indicators, methods and data sources further improved.



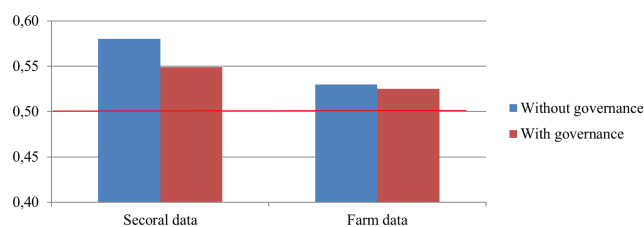
**Fig. 10. Levels of governance, economic, social, environmental and integral sustainability of Bulgarian agriculture, based on aggregate (sectoral) and farm (survey) data**

Source: Agro-statistics, experts’ assessments , B. Source: survey with farm managers



**Fig. 11. Sustainability indexes for major principles of governance sustainability, calculated on the base of sectoral and farm data**

Source: authors



**Fig. 12. Integral sustainability of Bulgarian agriculture “with” and “without” including governance aspect**

Source: author’s calculations

## Conclusions

This study has proved that it is important to include the “missing” Governance Pillar in the assessment of Integral sustainability of agriculture and sustainability of agro-systems of various types. It has demonstrated that (and how) the Governance sustainability level can be quantitatively “measured” and “integrated” in overall sustainability assessment system. Elaborated holistic framework has been successfully tested in Bulgarian conditions and showed promising results for proper understanding and fully “unpacking” the Governance sustainability of country’s agriculture.

Multiple Principles, Criteria and Indicators assessment of the Governance sustainability of Bulgarian agriculture indicates that the Overall Sustainability is at a “Good” but very close to the “Satisfactory” level. Besides, there is a considerable differentiation in the level of Integral Governance sustainability of agricultural sub-sectors, agro-ecosystems, agro-regions, and type of farming organizations. Results on the integral agrarian sustainability assessment of this study based on micro (farm) and macro (statistical, etc.) data show some discrepancies which have to be taken into consideration in the analysis and interpretation, while assessment indicators, methods and data sources further improved.

This study revealed that much of the needed information for calculating the Governance sustainability is not readily available and have to be collected through experts’ assessments, farm managers and professional associations surveys etc. Nevertheless, a big challenge is the (level of) competency and willingness for “honest” estimated of the interviewed agents. For instance, for some highly “sensitive” questions in the conducted (“anonymous”) survey many of the farm managers did not respond due to lack of opinion, experience, capability and/or reluctance for assessment, etc. Having in mind the importance of holistic assessments of this kind for improving the agrarian and governance sustainability, they are to be expended and their precision and representation increased.

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