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UNPACKING GOVERNANCE SUSTAINABILITY OF BULGARIAN AGRICULTURE⁴

Inclusion “fourth” Governance pillar in concept for understanding and assessment system of agrarian sustainability is increasingly justified in academic, government, international, and private organisations documents. In Bulgaria, practically there are no comprehensive assessments of governance sustainability of agriculture. This study tries to fill the gap and suggests a holistic framework for understanding and assessing the governance sustainability of Bulgarian agriculture. Newly elaborated approach is “tested” in a large-scale study for assessing governance sustainability of the country’s agriculture at national, sectoral, regional, eco-system and farm levels. It has been proved that it is important to include “missing” Governance Pillar in the assessment of integral and particular sustainability of agriculture and agro-systems of various type. Multiple Principles, Criteria and Indicators assessment of Governance sustainability of Bulgarian agriculture indicate that the Overall Governance Sustainability is at Good but close to Satisfactory level. There is a considerable differentiation in the level of Integral Governance sustainability of different agro-systems. Individual indicators with the highest and lowest values determine the critical factors enhancing or deterring particular and integral Governance sustainability of evaluated agro-system. Results on integral sustainability assessment based on micro and macro data show some discrepancies which are to be taken into consideration in analysis while assessment indicators, methods and data sources improved.

JEL: Q12; Q18; Q56

Introduction

A common feature of all suggested and practically used modern systems for assessing the sustainability of agro-systems is the incorporation of three “dimensions” or “pillars” of sustainability – economic, social and environmental (Bachev et al., 2017; Cruz et al., 2018; EC, 2001; FAO, 2013; Hayati et al., 2010; Kamalia et al., 2017; Lopez-Ridauira et al., 2002; Lowrance et al., 2015; OECD, 2001; Sauvenier et al., 2005; Singh et al., 2009; Terziev et al. 2018; VanLoon et al., 2005). In the last years, a special attention has been

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increasing put on the (good) “governance” as a key for achieving multiple goals of sustainable development at corporate, sectoral, national and international levels (Bachev, 2010; Bosselmann et al., 2008; Gibson, 2006; EU, 2019; Simberova et al., 2012; Kayizari, 2018; UN, 2015). What is more, the list of sustainability objectives has been constantly enlarged, encompassing numerous governance, cultural, ethical etc. standards and goals (Bachev, 2010; Scobie, Young 2018). Simultaneously “new” (cultural, human, governance, etc.) pillars has been widely added to the modern definition of sustainability and the systems of its evaluation and management (Altinay, 2012; ASA, 2019; Bachev, 2018; Nurse, 2006; RMIT University, 2017; UCLG, 2014).

The need to include “the fourth” governance pillar in the concept for understanding and the system of measurement of sustainability is increasingly justified in academic literature (Bachev, 2010, 2018; Baeker, 2014; Burford, 2017; Fraser et al., 2006; Monkelbaan, 2017) as well as finds place in the official documents of different (government, international, private, etc.) organisations (City of Brooks, 2019; EU, 2019; IFAD, 1999). The “good governance” is considered to be both a goal of sustainable development and a means to successfully realised diverse socio-economic, ecological etc. aspects of sustainability. Accordingly, numerous indicators are proposed to evaluate the governance aspect of sustainability mostly at national and international level including the state of the formal institutional framework, implementing policies and strategies, human resources development, established capacity, management of public authorities, stakeholder involvement in public decision-making and control, etc. (Bell, Morse 2008; Bhuta, Umbach, 2014; CoastalWiki, 2019; Ganev et al., 2018; Monkelbaan, 2017; Spangenberg et al., 2002).

Nevertheless, the building of the system for understating and assessing the “new” governance aspect (pillar) of agrarian sustainability is a “work in progress”. Still, there is no general consensus on: whether and how to include the governance as a new pillar of agrarian sustainability; how to define the governance (and the overall) agrarian sustainability; what are the relations between the governance sustainability of a farming enterprise and that of agriculture; what are the critical factors of governance (and overall) sustainability; how to formulate, select, measure and integrate diverse sustainability indicators; and how to properly evaluate the level of governance (and overall) sustainability in a dynamic world where hardly anything is actually “sustainable”.

Most of the suggested approaches for “assessing” governance sustainability are at conceptual and/or qualitative level. The few existing systems for governance sustainability measurement focus entirely of national and international level (comparison) without taking into consideration the specificity of the agricultural sector and the multiple agri-(sub)systems of various types. In some cases, the governance aspect of agrarian (sectoral) and farm (enterprise) sustainability are wrongly treated as identical. What is more, all available systems for governance sustainability assessment contain a list of “universal” indicators equally applicable (appropriate) for the unique (socio-economic, market, institutional, political, natural etc.) conditions of an individual country, and quite specific state and factors of agricultural development in each country and community, and the great variety of agricultural systems within a country, region, subsector, eco-system, type of farming organisation, etc.

Often the governance sustainability is evaluated on the base of qualitative analysis and experts estimates without applying any consistent methodology, reliable (representative, first-hand, micro) information, and quantitative methods. Commonly a holistic approach for sustainability assessment is not applied, and the “purely” governance, and “purely” economic, and “purely” ecological, and “purely” social aspects of agrarian development are studied (evaluated) independently from one another. Studying and assessing the governance sustainability is usually restricted to formal institutional environment and/or public modes without taking into account the important market, private, collective, and hybrid forms, and critical (and often dominating) “informal” governance.

Rarely a hierarchical structure or systematic organisation for sustainability indicators selection is applied and the individual components of governance (and the overall) agrarian sustainability are (pre)determined by direct “arbitrary” selection of different indicators. Generally, there is no any system (approaches, weights, interpretation modes, etc.) for the integration of the governance sustainability indicators in different areas into integral governance and sustainability level. The later prevents the proper understanding and assessment the specific role of various aspects of governance sustainability in the overall governance and agrarian sustainability as well as an effective improvement (“management”) of the governance and overall sustainability. Finally, most of the proposed systems of sustainability assessment cannot be practically used by the managerial bodies at different decision-making levels since they are difficult to understand, calculate, monitor, correctly interpret and used in the everyday activity of individual agents, organisations and agencies.

In Bulgaria, like in many other countries, there are a very few studies on governance issues related to agrarian sustainability (Bachev, 2010, 2018; Bachev et al., 2016; Bachev, Treziev, 2018; Georgiev, 2013; Marinov, 2019; Zvyatkova, Sarov, 2018) and the governance aspect (pillar) of agrarian sustainability (Bachev, 2016, 2017, 2018; Bachev et al. 2018; Bachev, Treziev, 2017, 2019). Moreover, practically there are no comprehensive assessments of the governance sustainability in the sector and its importance for the overall agrarian sustainability at the present stage of development.

This paper 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 (tested) in a first in a kind 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 agrarian sustainability in Bulgaria.

Framework for Assessing Governance Sustainability of Bulgarian Agriculture

Sustainability of agriculture is a “system characteristic”⁵ and has to be perceived as “ability to continue over time” (Bachev, 2005; Hansen, 1996). It characterises the ability (internal

⁵ In academic literature, and managerial and assessment practices still there is no consensus about “what is” (how to define) agrarian sustainability which is commonly defined as “alternative ideology” (Edwards et al., 1990.; VanLoon et al., 2005); “new strategy” (Mirovitskaya and Ascher,

capability and adaptability) of agriculture to maintain its managerial, economic, social and environmental functions in a long period of time. Agrarian sustainability has four major aspects (“pillars”) which are equally important and have to be always accounted for – governance sustainability, economic sustainability, social sustainability, and environmental sustainability.

The “governance sustainability” characterises the efficiency of the specific system of governance in an evaluated agro-system (national, subsector, ecosystem, regional, farming enterprise, etc.). Accordingly, a “good governance” means a superior governance sustainability, while a “bad” (inefficient) governance corresponds to inferior governance sustainability. Governance sustainability is simultaneously a major system feature as well as a means to achieve other multiple goals of the system and the “states” of economic, social and environmental sustainability. Having in mind its important role for achieving, maintain and improving the overall agrarian sustainability, it could be underlined, that the governance sustainability is the “first” (pillar) among (four) “equals”.

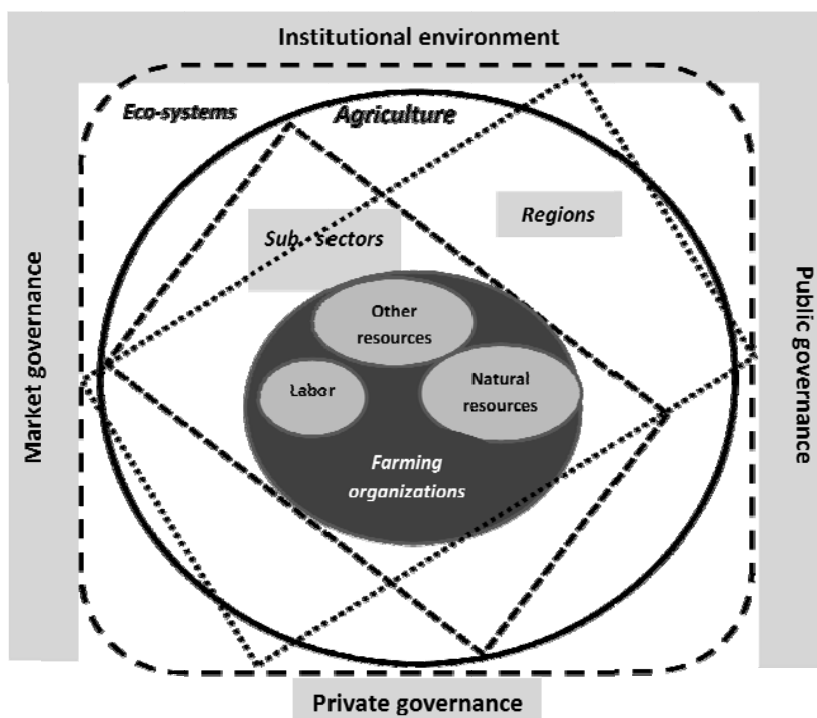
Maintaining multiple functions (sustainability) of agriculture requires an effective social order – a system of diverse (governing) mechanisms and forms regulating, coordinating, stimulating, and controlling the behaviour, actions and relations of individual agents at various levels – farm, local, regional, national, transnational, global (Bachev, 2010). The system of governance includes a number of district components all of which have to be included in the sustainability assessment – *institutional environment* (“rule of the game”), *market* modes and mechanisms (“market order”), *private* modes and mechanisms (“private order”), and *public* modes and mechanisms (“public order”) (Figure 1).

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”. In this study we focus on the assessment of the (governance) sustainability of Bulgarian agriculture at the national level as well and for the principle agricultural systems in the country – main type of farming organisations, major subsectors of agriculture, general kinds of agro-ecosystems, and all administrative (agro)regions (Figure 1). The farm is the lowest level, where the management and organisation of agricultural activity (and sustainability) is carried out, and where all aspects of agrarian sustainability are “realised” and could be feasibly assessed (Bachev, 2005). That is why the farm (agro-system) rather than the smaller agro-systems within a farm boundary is the first level of agrarian (economic, governance, integral, etc.) sustainability assessment.⁶

2001); “characteristic of agrarian system like „ability for achieving multiple goals” (Brklacich et al., 1991; Hansen, 1996) or “capability (potential) for maintain and improve its functions” (Lopez-Ridaura et al., 2002; Lewandowski et al., 1999); “process of understanding and adapting to changes” (Raman, 2006), etc.

⁶ Many holistic sustainability assessment frameworks put a smaller ecosystem (“individual farming plot”, “a pond”, etc.) as the lowest (first) level of sustainability assessment in agriculture (Sauvenier et al., 2005).

Figure 1
Components and Levels of Assessment of Governance Sustainability in Agriculture



Source: authors

Furthermore, a special distinction is made between the governance sustainability of agriculture and the sustainability of management (“governance”) structures in agriculture.⁷ While the sustainability of certain type of farms (e.g. “family holding”) is included as major criteria for assessing the “social” (pillar) of agrarian sustainability, the specific level of sustainability of the individual governing structures (different type of farms, producers organisations, administrative bodies, etc.) is not a part of or related to the agrarian sustainability evaluation. It is well known that sustainable development is commonly associated with the adaptation of farms and other governance structures to constantly evolving socio-economic, market, institutional and natural environment which process is associated with diminishing importance (“sustainability”) and/or liquidation of a certain type of farms (public, cooperative, small-scale), restructuring and modernisation of farming enterprises and agrarian administration, and the emergence of diverse complex, vertically integrated and hybrid forms of governance, etc.

⁷ A comprehensive framework for assessing sustainability of farming enterprises is suggested by Bachev (Bachev, 2017, 2018).

On the other hand, the Governance sustainability of agriculture expresses the (“working”) state and contribution (toward sustainability goals) of the principle governing mechanisms and forms in the evaluated agro-system. Most of these mechanisms and modes of governance concern (affect) the specific governing structures used by individual agents (including farms, farming organisations, contractual and vertically integrated forms) and their sustainability but many are related to (farms’ relations with and) other agrarian agents (resource owners, labour, inputs suppliers, processors, retailers, final consumers, agrarian administration, etc.), while other are associated with intra-entity/farm elements (e.g. enforcement of work, food safety, animal welfare, and environment standards, etc.).

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

The *Governance Sustainability Principles* are “universal” and relate to the multiple functions of agriculture representing the states of sustainability, which is to be achieved (Figure 2). For the “specific” contemporary conditions of Bulgarian (and European Union) agriculture following five (governance sustainability) principles related to the generic (five) mechanisms and modes of governance⁸ are identified: Good legislative system, Democratic management, Working agrarian administration, Working market environment, and Good private practice.

The *Governance Sustainability Criteria* are precise standards (“measurement approaches”) for each of the Principles representing a resulting state of the evaluated system when the relevant sustainability Principle is realised. For the contemporary conditions of Bulgarian agriculture 20 Criteria for assessing diverse aspects of the governance sustainability are specified. For instance, for the principle Good legislative system four Criteria are selected: Harmonisation with the European Union policies, Extent of the European Union policies implementation, Beneficiaries’ satisfaction of the European Union policies, and Policies effects.

The *Governance Sustainability Indicators* are quantitative and qualitative variables of different types which can be assessed in the specific conditions of evaluated agri-system, allowing measurement of compliance with a particular Criterion. The set of Indicators provides a representative picture for the agrarian sustainability in all its aspects. For assessing the Governance sustainability of Bulgarian agriculture at a micro (farm) and macro (sectoral, regional, eco-system, etc.) levels a system of respectively 22 and 26 Indicators are specified⁹. For instance, for the Criteria Policies effects an Indicator Level of

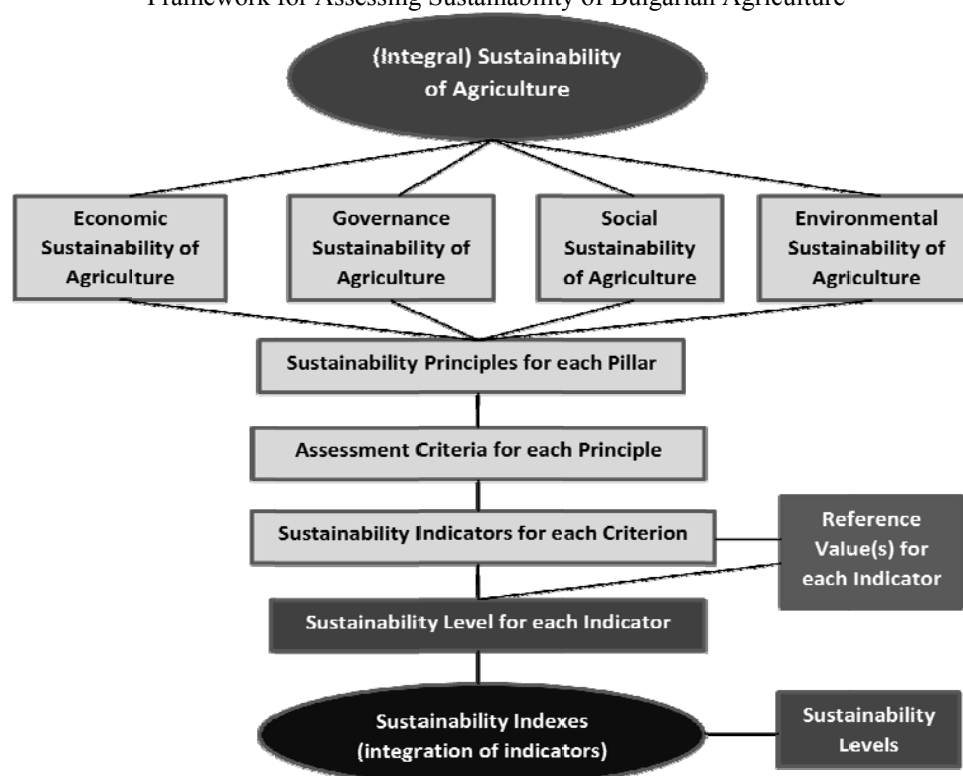
⁸ Components of the governance system of agriculture is comprehensively presented by Bachev (2010).

⁹ For selection of the Sustainability Indicators a number of criteria, broadly applied in sustainability assessment literature and practices, were used: Relevance to reflecting aspects of sustainability, Discriminatory power in time and space, Analytical soundness, Intelligibility and synonymity, Measurability, Governance and policy relevance, and Practical applicability (Sauvenier et al., 2005).

subsidies comparing to the average for the sector is selected for farm level, as well as two Indicators for the aggregate (sectoral) level – Coefficient of subsidies distribution from Pillar 1, and Coefficient of distribution of investment support comparing to share in Net Value Added.

Figure 2

Framework for Assessing Sustainability of Bulgarian Agriculture



Source: authors

For assessing the particular sustainability level, a system of specific Reference Values (sustainability norms, range, and standards) for each Indicator is needed. The *Governance Sustainability Reference Values* are the desirable levels for each Indicator according to the specific conditions of evaluated agro-system. They assist the assessment of sustainability levels giving guidance for achieving (maintaining, improving) particular aspect and the overall agrarian sustainability. Most of the Reference Values show the level(s), at which the long-term sustainability of agrarian Governance sustainability is “guaranteed” and improved. Depending on the extent of the Reference value achievement, the evaluated agro-system may be with a “high”, “good”, or “low” sustainability, or to be “unsustainable”. For instance, the agrarian system with a higher than the sectoral public

support (level of subsidies) is more sustainable than others as far as Policy effects are concerned, and vice versa.

Very often, individual Indicators for each Criterion and/or different Criteria, and Principles of sustainability are with unequal, and frequently with controversial levels. That significantly hardens the overall assessment requiring a transformation into “unitless” Sustainability Index and integration of estimates (Figure 2). Diverse quantitative and qualitative levels for each indicator are transformed into an Index of sustainability (ISi) applying appropriate scale for each Indicator (Bachev et al., 2018).

The Integral Sustainability Index for a particular Criterion (SI(c)), Principle (SI(p)), and Aspect of sustainability (SI(a)), and the Integral Sustainability Index (SI(o)) 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 indeed Sustainability Principles, are “by definition” equally important for the Integral Agrarian Sustainability. At the same time, differentiation of the weights of individual Criteria within each principle and the individual Indicators within each Criterion is difficult to justify as well as to a great extent unnecessary (practically unimportant for the Integral assessment) having in mind the big number and small relative contribution of each Indicator¹⁰.

The Integral Index for a particular Criterion (SI(c)), Principle (SI(p)), and Aspect of sustainability (SI(a)), and the Integral Sustainability Index (SI(o)) are arithmetic averages of the Indices of composite Indicators, Criteria and Principles, calculated by the following formulas:

$$SI(c) = \sum SI(i)/n \quad n - \text{number of Indicators in a particular Criterion};$$

$$SI(p) = \sum SI(c)/n \quad n - \text{number of Criteria in a particular Principle};$$

$$SI(a) = \sum SI(p)/n \quad n - \text{number of Principles in a particular Aspect};$$

$$SI(o) = \sum SI(a)/4$$

For assessing the level of Governance and Integral sustainability of agro-systems in Bulgaria the following scale, defined by the leading experts in the area (Bachev et al. 2018) are used:

Index range 0.81-1 for a “High” level of sustainability;

Index range 0.50-0.8 for a “Good” level of sustainability;

Index range 0.26-0.49 for a “Satisfactory” level of sustainability;

Index range 0.06-0.25 for an “Unsatisfactory” level of sustainability;

Index range 0-0.05 for “Non-sustainable” state.

¹⁰ Calculations with and without differentiated weights do not find any significant variations in the sustainability levels (Bachev et.al, 2019).

The integration of Indicators does not diminish the analytical power of suggested assessment system, since it makes it possible to compare (specific and integral) sustainability of diverse aspects of an agro-system and of agro-systems of different types, as well as identify “critical” factors for maintaining and improving sustainability. Besides, since the assessment of sustainability levels for the individual Indicators is a (pre)condition for of the integration itself, the primary information always is available and could be analysed in details if that is necessary. Depending on the objectives of final users and analysis, the extent of integration of Indicators could be differentiated. While farm managers, investors, researchers etc. may prefer detailed information for each Indicator, for decision-making at a higher level (government, policy-makers, international) more aggregated assessment are needed (sufficient).

An elaborated holistic framework for assessing the Governance sustainability of Bulgarian agriculture is tested using experts and stakeholders assessments, and 2018 survey data¹¹ from the managers of 104 “typical farms” of different size and juridical type, production specialisation, and ecological and geographical locations. Structure of surveyed farms approximately corresponds to the real structure of farms of different categories in Bulgaria. Classification of surveyed farms into juridical type, size, production specialisation, ecological and geographical location is done according to the official definitions 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) level (Bachev et al., 2018). 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 managers. The composite (Aspect and Integral) Sustainability Index of each evaluated agri-system (farming organisation, agricultural subsector, agri-ecosystem, geographical region, etc.) is calculated as an arithmetic average of the Indices of relevant farms belonging to that system.

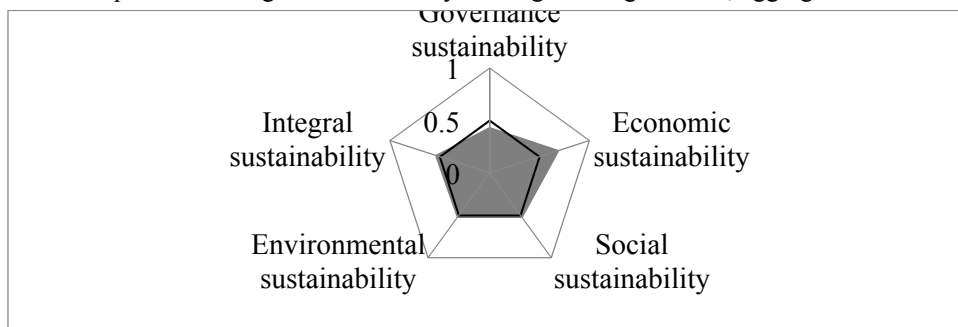
Governance and Integral Sustainability of Bulgarian Agriculture

Comprehensive assessment of Governance sustainability of Bulgarian agriculture by using aggregate (sectoral) and farming (survey) data shows unlike results – Satisfactory level in the former case, and close to Satisfactory” but Good level in later (Figures 3, 4). Overall and Principles sustainability estimates based on farm managers assessments are higher than those calculated on the base of the official (statistical, FADN, etc.) information and experts estimates (Figure 5). Discrepancies in Principles Democratic management, Working market environment, and Good legislative system are crucial, putting Governance sustainability in different levels. Thus Governance sustainability assessments have to be based on complementary macro and microdata in order to increase accuracy.

¹¹ We express our gratitude to National Agricultural Advisory Service for conducting the survey, and participated farm managers for providing valuable information.

Figure 3

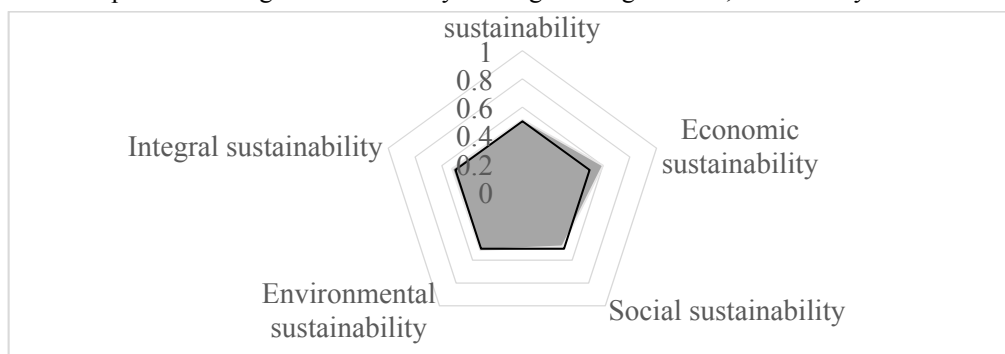
Aspects and Integral Sustainability of Bulgarian Agriculture, aggregate data



Source: Agro-statistics, experts' assessments

Figure 4

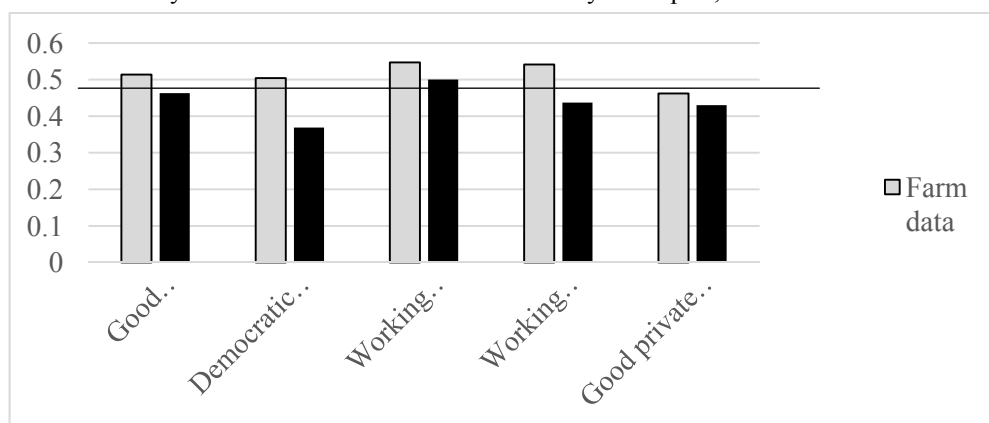
Aspects and Integral Sustainability of Bulgarian Agriculture, farm survey data



Source: survey with farm managers

Figure 5

Sustainability Indexes for Governance Sustainability Principles, sectoral and farm data

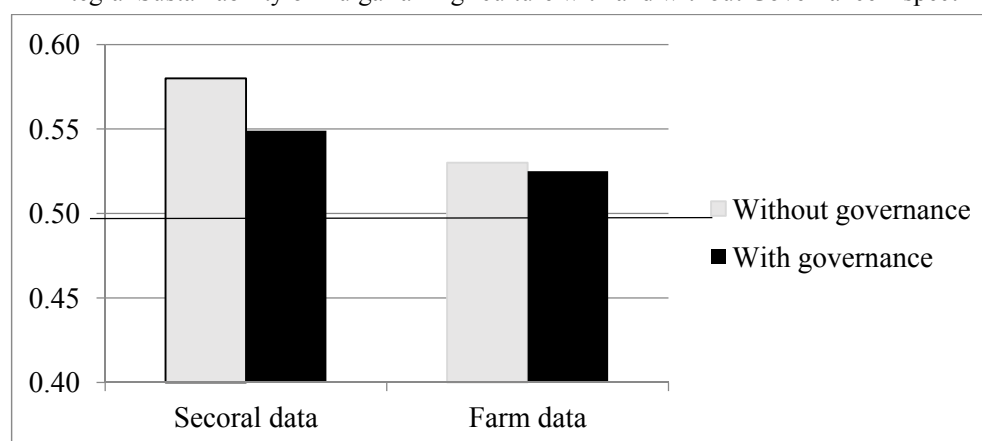


Source: authors

Inclusion of Governance Aspect changes Integral Sustainability Index of Bulgarian agriculture using sectoral (with 0,03), and to a smaller extent farm (with 0,005) based estimates (Figure 6). Taking into account that aspect does not modify Overall (Good) sustainability level using both types of information. There are also differences in Sustainability Indexes for other aspects based on sectoral and farm data (Figure 3, 4) particularly for Economic and Social sustainability (0,1 and 0,05). Estimates based on official sectoral data for Economic, Social and Environmental aspects are higher than corresponding levels based on micro-farm data. Consequently, they do not affect Integral sustainability compensating contribution to Overall sustainability of Governance pillar.

Figure 6

Integral Sustainability of Bulgarian Agriculture with and without Governance Aspect



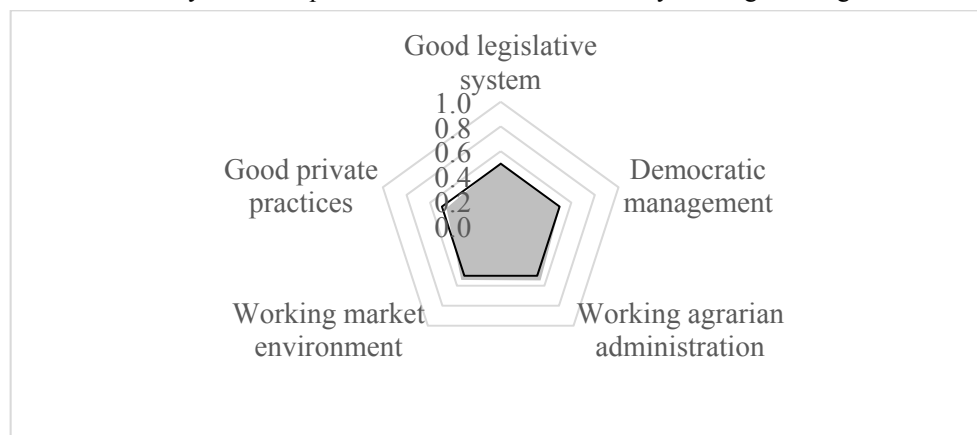
Source: authors calculations

Inclusion of missing new Governance aspect is crucial since it ameliorates the precision of sustainability assessment. However, all dynamics in estimates between sustainability pillars based of different type of data are to be taken into consideration in analysis while assessment indicators, methods and data sources improved.

Overall Level of Governance Sustainability

Multi-indicators assessment of Governance sustainability of Bulgarian agriculture indicates that Index of Overall Sustainability is 0,51 – this represents a close to Satisfactory but Good level (Figure 4). Analysis of Indexes for Principles, Criteria, and Indicators allows identifying components contributing to Governance sustainability. For instance, Governance sustainability of agriculture is relatively low because Index for Principle Good Private Practices is at Satisfactory level (0,46) compromising Integral sustainability. Indices for Good Legislative System and Democratic management are at border with Satisfactory level – 0,5 and 0,51. Indices for Principles Working agrarian administration (0,55) and Working market environment (0,54) are the highest contributing most for elevating Governance Sustainability.

Figure 7
Sustainability for Principles of Governance Sustainability of Bulgarian Agriculture



Source: authors calculation.

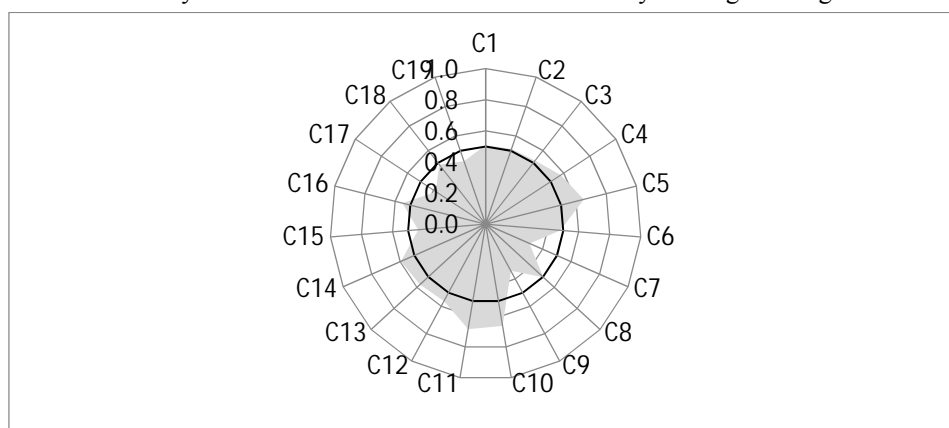
Analysis of levels of individual Criteria and Indicators further specifies elements that enhance or reduce sustainability. For instance, insufficient Good Private Practices is determined by low External control (0,38), weak Contracts enforcement (0,49) and inferior Informal system efficiency (0,43) (Figure 8). Despite that Integral Index for Democratic management Principle is at Good level, Indices for two criteria (Impact and Stakeholder participation in decision-making) are at satisfactory territory. Working agrarian administration seems Good, but Access to administrative services is very low (0,34) at Satisfactory level. The same is for Working market environment, which is Good while Index for Criteria Resource concentration reveals low sustainability (0,43).

Individual sustainability Indicators give information about specific factors determining one or another value of particular Criteria – e.g. ineffective Access to administrative services is determined by insufficient Agrarian administration efficiency (0,31) and undeveloped Administrative services digitalisation (0,37) (Figure 9); Satisfactory sustainability for Resource concentration is a consequence of low Possibility for lands extension (0,37), etc.

Low Indicators values help identify areas that require improvement through adequate changes in the institutional environment, public policy, agrarian administration, collective actions and management strategies. Most critical for increasing the Governance sustainability of country's agriculture at the current stage are progressive improvements in Farmer's participation in decision-making, Agrarian administration efficiency, Administrative services digitalisation, 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.

Figure 8

Sustainability for Criteria* of Governance Sustainability of Bulgarian Agriculture

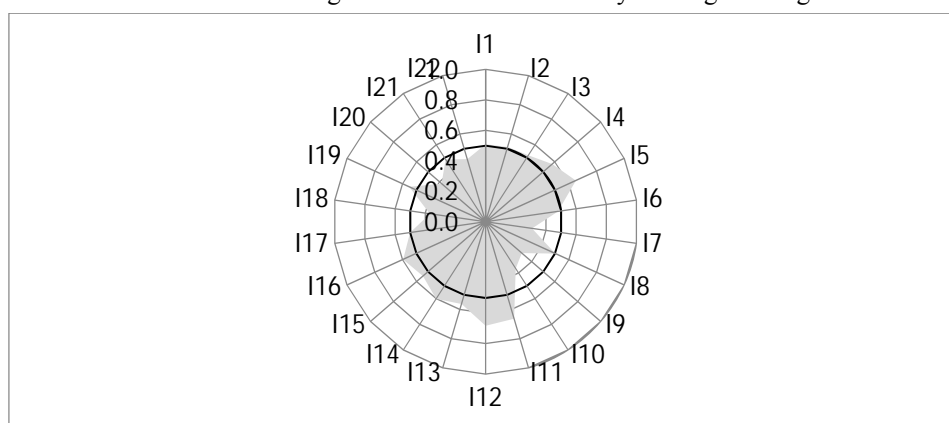


* C1-Extent of policies implementation; C2-Extent of beneficiary satisfaction of EU policies; C3-Policies effects; C4-Representation; C5-Transparency; C6-Impact; C7-Stakeholder participation in decision-making; C8-Minimum costs of using; C9-Access to administrative services; C10-Information availability; 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: authors calculation

Figure 9

Indicators* for Assessing 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 digitalisation; 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.

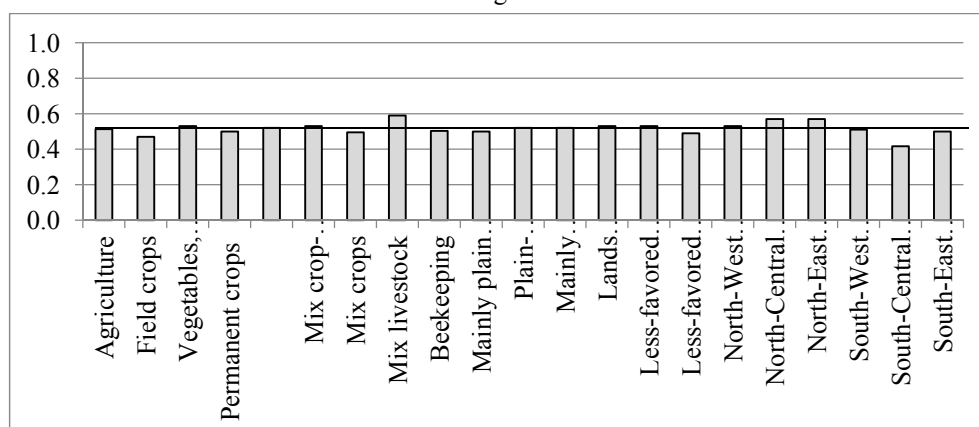
Source: farm survey

Higher levels of Indicators show absolute and comparative advantages of Bulgarian agriculture in terms of good governance, most prominent of which presently are 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. Top value(s) of Governance sustainability is relatively low indicating a great potential for improvement of governance efficiency.

Governance Sustainability in Agricultural Sub-sectors

Highest (Good) level of Governance sustainability is demonstrated in Mix livestock production, followed by Vegetables, flowers, mushrooms and Mix crop-livestock sectors (Figure 10). Thus, these subsectors contribute to the greatest extent for improving overall sustainability. On the other hand, in Field crops and Mix crops level of Governance sustainability is Satisfactory specifying subsectors decreasing in a biggest degree Integral sustainability of agriculture.

Figure 10
Governance Sustainability in Agricultural Sub-sectors, Agri-ecosystems and Regions of Bulgaria



Source: farm survey

Different sub-sectors are characterised by the significant variation of Governance sustainability levels for main Principles (Figure 11). For instance, Principle Good legislative system is best realised in Vegetables, flowers, mushrooms and Mix-livestock productions, and worst in Field crops and Grazing livestock sub-sectors. Democratic management is best applied in Mix livestock production, while it is not Satisfactory in Beekeeping, Mix crops and Mix crop-livestock sub-sectors. Principle Working agrarian administration is effectively applied in Beekeeping, Grazing livestock and Mix crop-livestock, while the administration does not work well for Field crops. Sustainability for principle Working market environment is highest in Mix livestock, Beekeeping and Mix

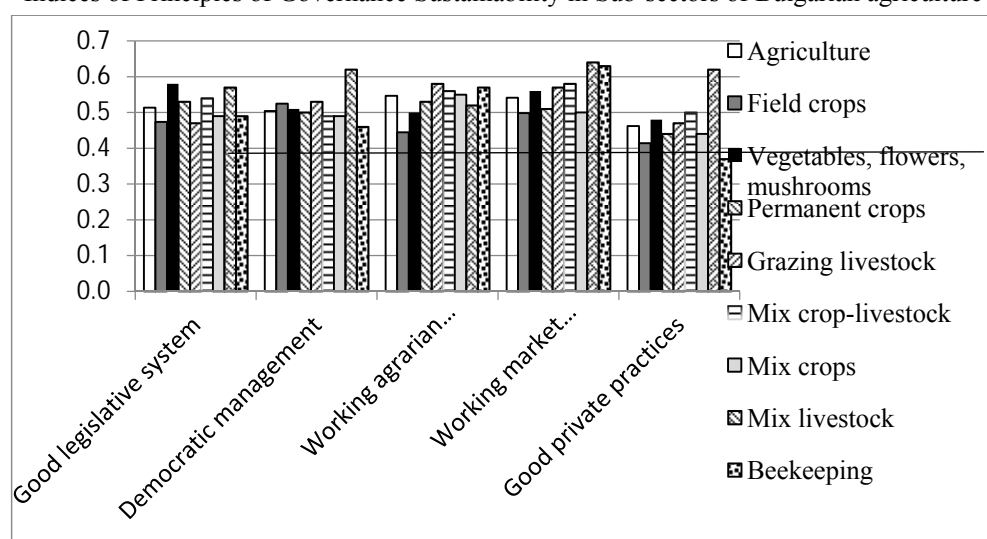
crop-livestock, while market mechanisms are not working well for Field crops producers. Good private practices are best implemented in subsector Mix livestock and Mix crop-livestock, while in all other they are applied Satisfactorily, particularly inferior in Beekeeping and Field crops.

Analysis of that type identifying inferior (critical) levels for sustainability Principles has a high practical value showing specific directions (public, collective and private action areas) for improving Particular and Integral Governance sustainability in the evaluated subsector.

Further analysis of the sustainability level for individual Indicators allows complete unpacking critical factors enhancing or decreasing Governance sustainability. Different agricultural sub-sectors in Bulgaria are characterised by significant variation in levels of individual Governance Sustainability Indicators.

Field crops subsector has very Good sustainability for Market competition and Representativeness of state and local authorities, and marginal for Prices negotiation possibilities (Figure 12). For most Indicators Governance sustainability is Satisfactory, being particularly low in Administrative services digitalisation and Extent of competitive allocation of public resources.

Figure 11
Indices of Principles of Governance Sustainability in Sub-sectors of Bulgarian agriculture

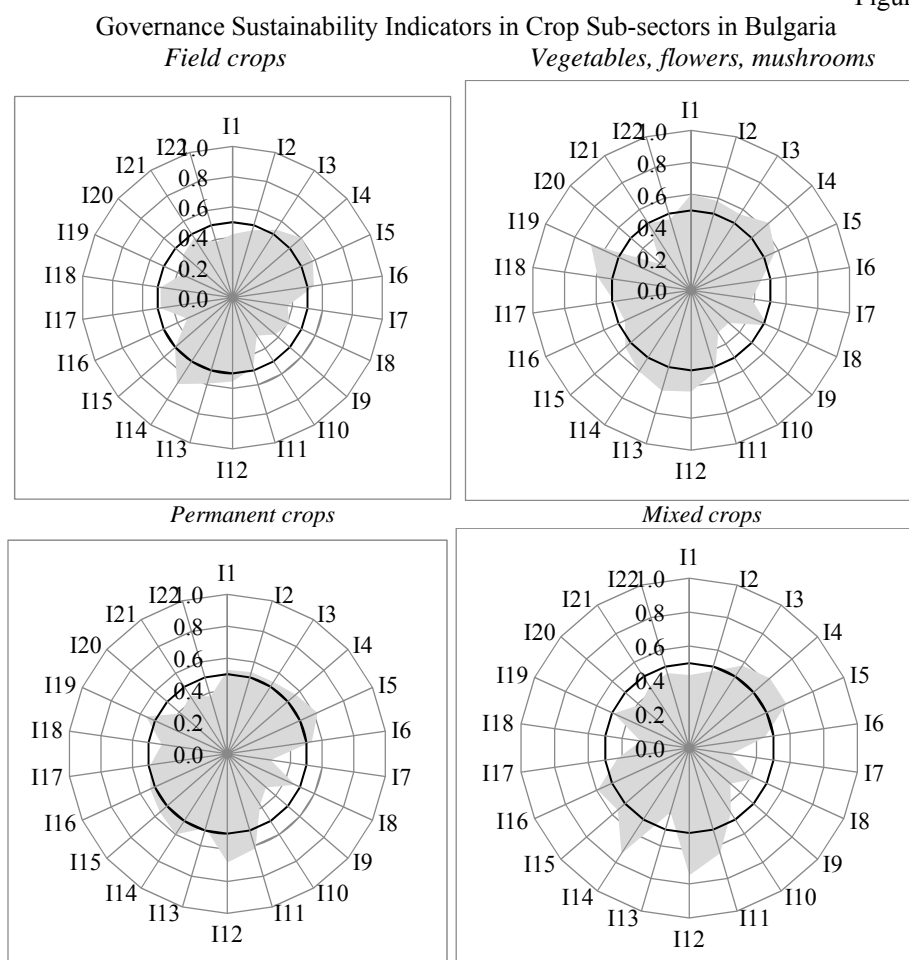


Source: farm survey

Governance sustainability of Vegetables, flowers and mushrooms subsector is Good for a number of Indicators and highest for Extent of regulations implementation, Representativeness of state and local authorities, Market access difficulties, Administration service costs, Extent of CAP implementation, and Market competition (Figure 12). It is at Satisfactory level for numerous Indicators being quite low for Agrarian administration

efficiency and Administrative services digitalisation. Moreover, for Management Board external control, it is Unsatisfactory affecting adversely sector's overall sustainability.

Figure 12



Source: farm survey

Governance sustainability of subsector of Permanent crops is Good for many Indicators, superior of which are Administration service costs, Access to information, Extent of awareness, Market competition (Figure 12). Governance sustainability is Satisfactory for many indicators and particular low for Agrarian administration efficiency and close to the Unsatisfactory level for Farmer's participation in decision-making.

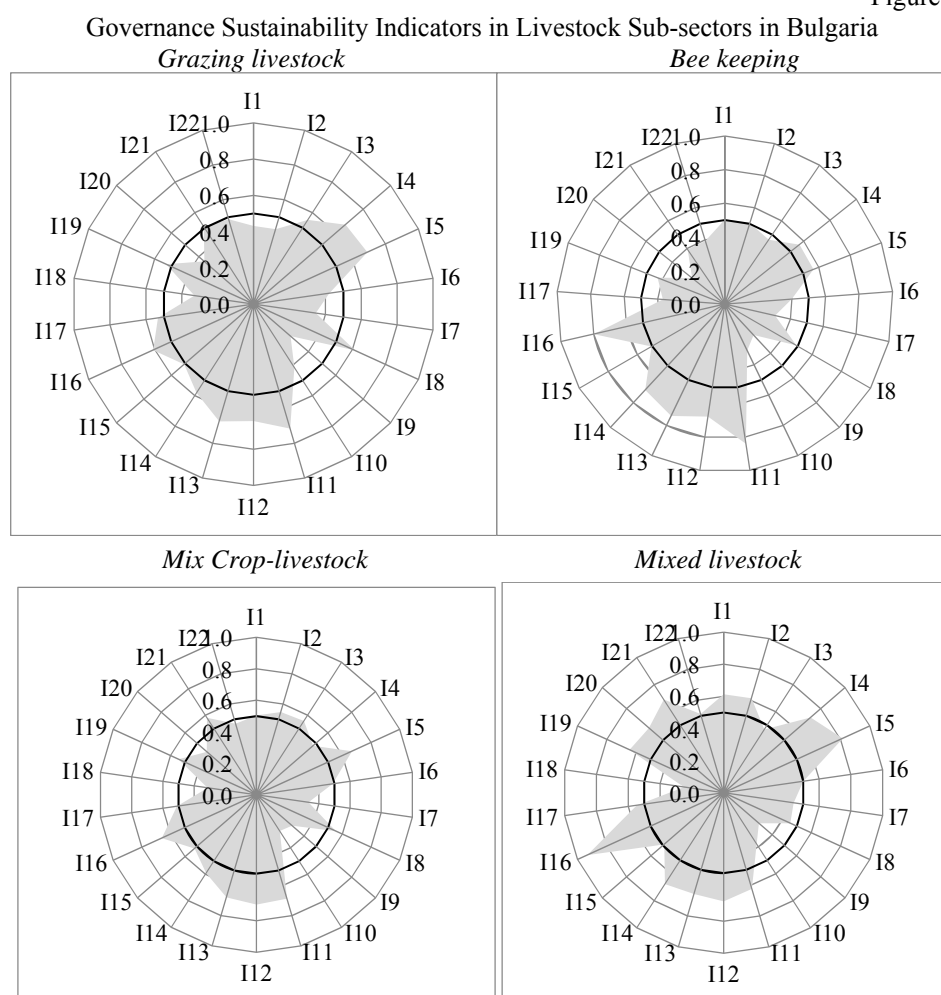
Governance sustainability of Mix crops productions is Good for several Indicators but particularly high for Market competition and Administration service costs (Figure 12). This subsector demonstrates Satisfactory sustainability for numerous areas being particularly

low for Possibility for lands extension and Agrarian administration efficiency, and in Unsatisfactory level for Farmer's participation in decision-making.

Governance sustainability in Grazing livestock sub-sector is particularly Good for Extent of awareness (Figure 13). This production experiences Satisfactory level of governance efficiency in multiple directions being particularly low for Agrarian administration efficiency.

Governance sustainability in Beekeeping is High for Extent of awareness and very Good for Extent of competitive allocation of public resources (Figure 13). At the same time, numerous Indicators are quite low at Satisfactory level and Unsatisfactory for Agrarian administration efficiency and Management Board external control.

Figure 13



Source: farm survey

Governance sustainability of Mix crop-livestock productions is Good for numerous Indicators being superior for Administration service costs (Figure 13). It is Satisfactory in multiple directions and quite low for Administrative services digitalisation.

Governance sustainability of Mix livestock productions is High for Extent of competitive allocation of public resources and Access to information (Figure 13). This industry demonstrates a very Good level for many indicators such as Representativeness of state and local authorities, etc. For several key areas sustainability is at Satisfactory level particularly low for Agrarian administration efficiency while for Possibility for lands extension is Unsatisfactory.

Governance Sustainability in Major Agro-ecosystems in Bulgaria

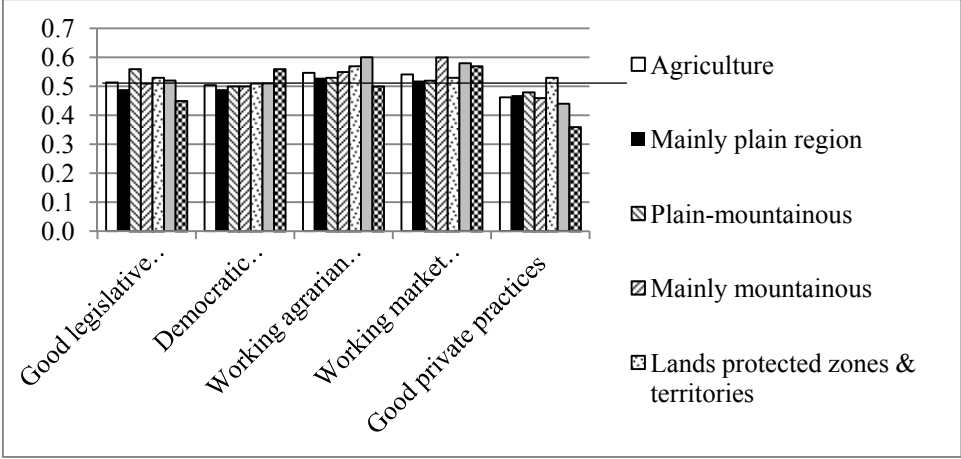
Governance sustainability of major agro-ecosystems also demonstrates a great variation as highest (Good) ones are registered for agro-ecosystems with Lands in protected zones and territories and in Less-favored mountainous regions (Figure 10). At the same time, Governance sustainability of two agro-ecosystems Mainly plain and Less-favored non-mountainous (0,49) are below the sectoral average, the second one being at inferior (Satisfactory) level. Thus, the later agro-ecosystems decrease to the biggest extent Integral Governance sustainability of Bulgarian agriculture.

Different agro-ecosystems of the country are characterised by significant differentiations in levels of Indices of Principles of Governance sustainability (Figure 14). Principle Good legislative system is best implemented at Good level in Plain-mountainous agro-ecosystems, while in Less-favored non-mountainous and Mainly plain regions it is at Satisfactory level. Principle Democratic management is best realised in Less-favored non-mountainous agro-ecosystems, in most other types it is same or close to sectoral average, and in Mainly plain regions it is at Satisfactory level. Principle Working agrarian administration is better applied in 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 below the national level. Principle Working market environment is with the highest value in 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 the national one. Governance sustainability for principle Good private practices is best implemented in Lands protected zones and territories, while in all other agro-ecosystems it is at Satisfactory level, being far worse than the sectoral average in Less-favored non-mountainous regions.

Individual Indicators for Governance sustainability of specific agro-ecosystems of the country have quite different values. Sustainability of agro-ecosystems in Mainly plain regions is with highest governance Indicators for Access to information, Extent of awareness, and Administration service costs (Figure 15). Multiple factors associated with imperfections in the governance system are Satisfactory decreasing (Governance) sustainability of these agro-ecosystems, being particularly low for Farmer's participation in decision-making and Agrarian administration efficiency.

Figure 14

Indices of Principles of Governance Sustainability in Major Agri-ecosystems in Bulgaria

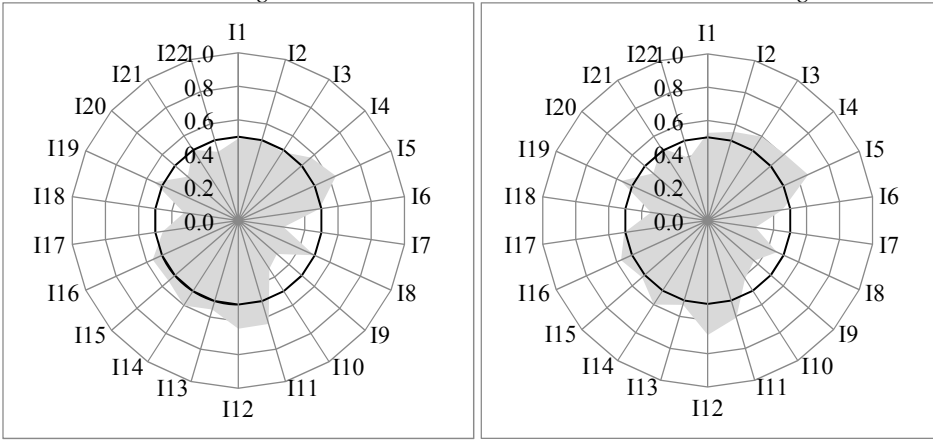


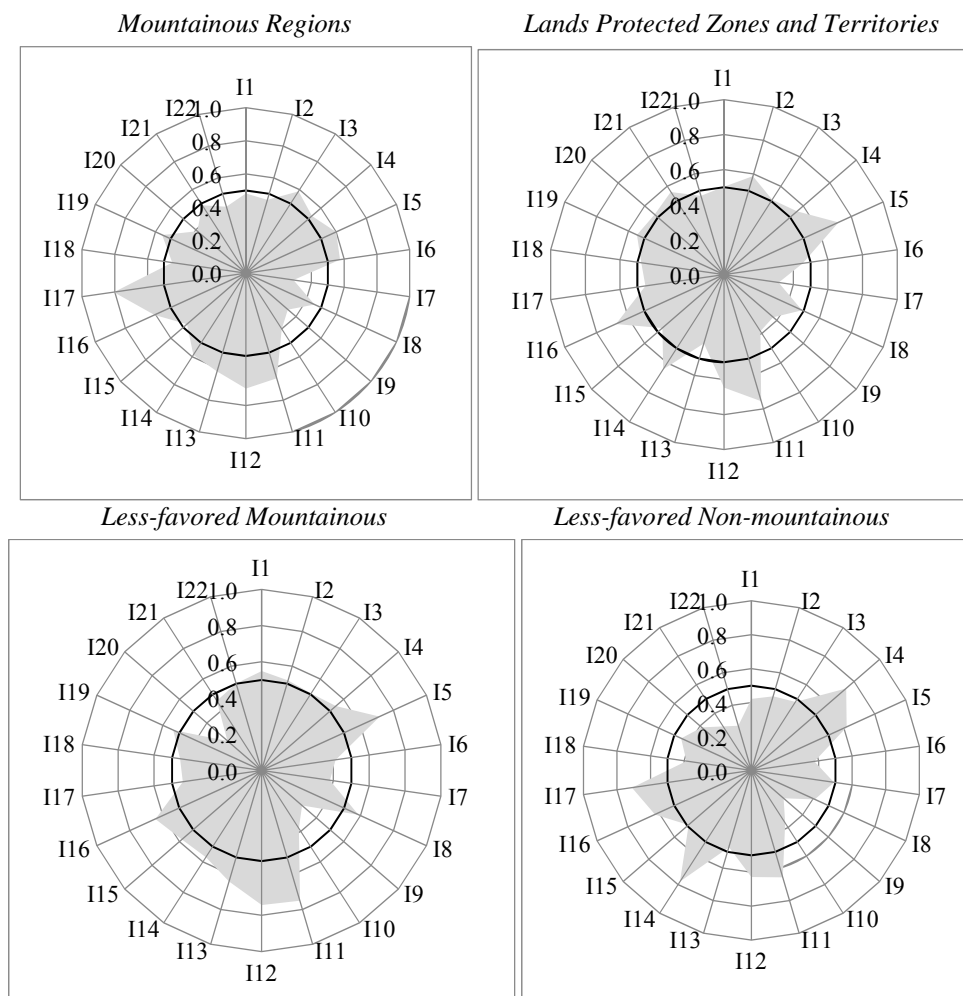
Source: farm survey.

Greatest Governance sustainability Indicators for agro-ecosystems in Plain-Mountainous Regions of the country are Administration service costs, Access to information, Extent of awareness, and Representativeness of state and local authorities (Figure 15). For a number of key Indicators level of Governance sustainability is Satisfactory, being particularly inferior for Farmer's participation in decision-making.

Figure 15

Governance Sustainability Indicators in Different Agri-ecosystems in Bulgaria
Plain Regions Plain-Mountainous Regions





Source: farm survey.

Governance sustainability of agro-ecosystems in Mountainous Regions is enhanced mostly by Quality of services and Information availability (Figure 15). Governance sustainability of these agro-ecosystems is at Satisfactory level for a number of indicators and particularly compromised for Stakeholder participation in decision-making.

Agro-ecosystems with Lands in Protected Zones and Territories are with very Good Governance sustainability for Information availability and Transparency (Figure 15). Governance sustainability of these agro-ecosystems is inferior in a number of areas such as Stakeholder participation in decision-making, Access to administrative services, etc.

Less-favored Mountainous agro-ecosystems are with quite Good Governance sustainability for Information availability, Quality of services, and Transparency (Figure 15). Governance sustainability of such agro-ecosystems is Satisfactory in terms of numerous indicators. Besides, these agro-ecosystems are with Unsatisfactory sustainability as far as Management Board external control is concerned.

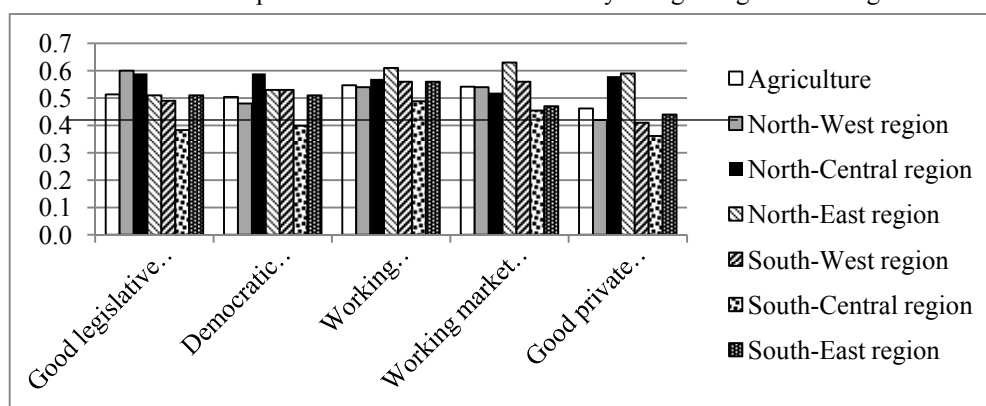
Agro-ecosystems in Less-favored Non-mountainous regions are with very Good sustainability for Market competition, Representativeness of state and local authorities, Lands concentration, Extent of awareness, Administration service costs, Extent of competitive allocation of public resources, and Access to information (Figure 15). For all other Indicators Governance sustainability of this specific agro-ecosystem is Satisfactory, and for Agrarian administration efficiency even Unsatisfactory.

Governance Sustainability in Agro-regions of Bulgaria

There is a significant variation in different aspects of Governance efficiency among administrative (and agricultural) regions of the country. Principle of Governance sustainability Good legislative system dominates in North-West and North-Central regions, while in South-Central and South-West regions, it is only applied Satisfactorily (Figure 14). Principle of Democratic management is best realised in North-East and South-West regions, and insufficiently in South-Central and North-West regions. Principle Working agrarian administration is effectively applied in North-East region and North-East regions. Simultaneously, that Principle is Satisfactory applied in South-Central region. Principle Working market environment is highly regarded in North-East region, while in South-Central and South-East regions is inferior. Good private practices are best carried out in North-Central region and North-East regions while in the three southern regions, they are enforced Satisfactorily.

Figure 16

Indices of Principles of Governance Sustainability in Agro-regions in Bulgaria

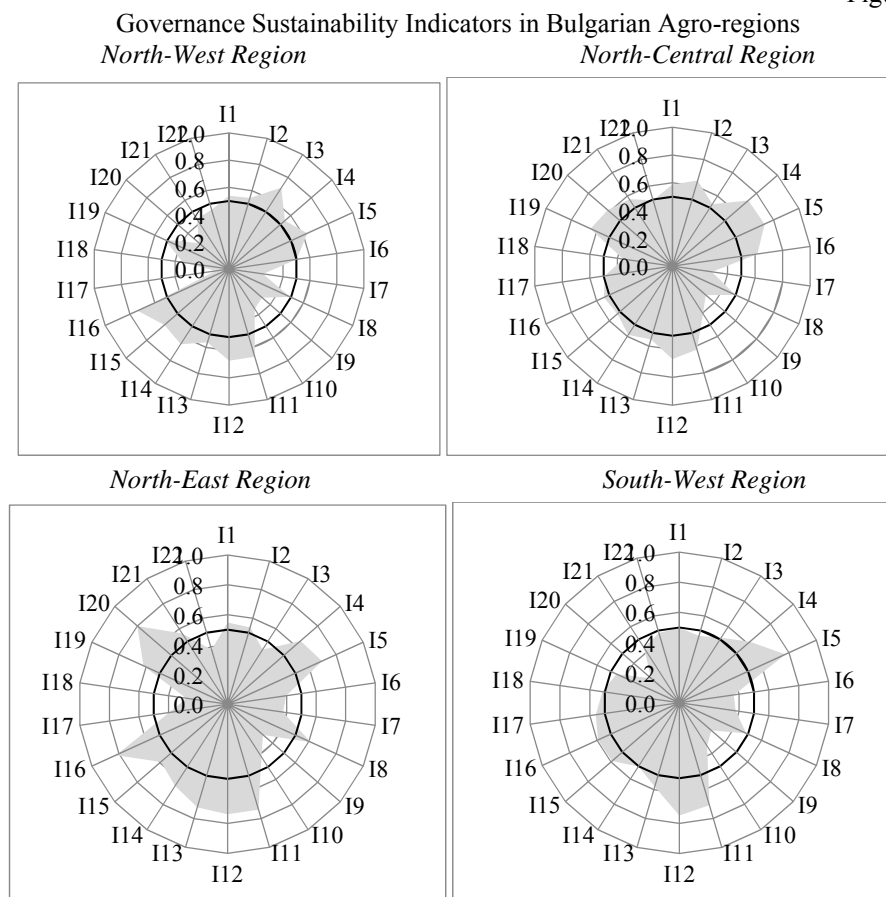


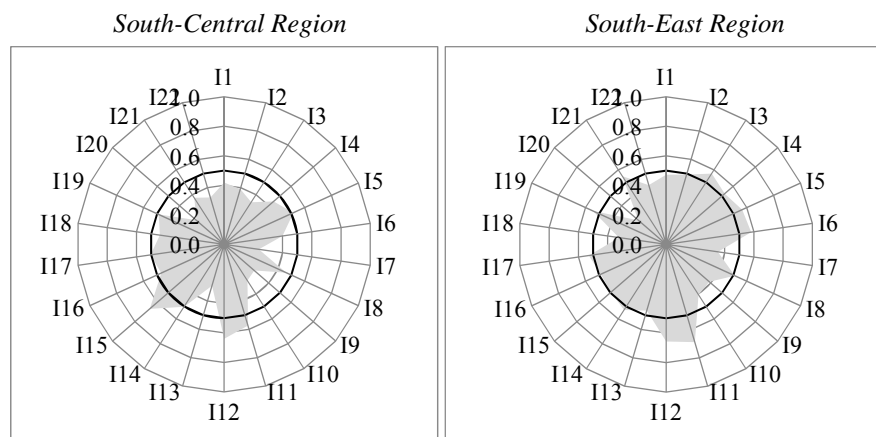
Source: farm survey

There is a big variation in the levels of Governance sustainability indicators across the territory of the country. In North-West Region the highest value of sustainability is for Indicators Extent of competitive allocation of public resources and Subsidies distribution (Figure 17). In this agro-region Governance sustainability is Satisfactory for a number of Indicators, being quite low for Management Board external control, and Unsatisfactory for Farmer's participation in decision-making.

Governance sustainability of agriculture in North-Central Region is very Good in respect to Access to information and Representativeness of state and local authorities (Figure 17). Simultaneously, the governance system in this agro-region works only Satisfactory in regards to Farmer's participation in decision-making, Agrarian administration efficiency, Possibility for lands extension, Administrative services digitalisation, and Lands concentration.

Figure 17





Source: farm survey

Agrarian Governance sustainability in North-East Region demonstrates a superior (High) level for Extent of competitive allocation of public resources and is on the border with highest level for Management Board external control (Figure 17). Governance efficiency is also quite Good in several other directions: Extent of awareness, Administration service costs, Market access difficulties, and Access to information. Nevertheless, Governance sustainability of agriculture in that region is at Satisfactory level for several key areas and especially low for Possibility for lands extension.

Agriculture in South-West Region is with very Good Governance sustainability for Indicators such as Access to information, Administration service costs, and Extent of awareness (Figure 17). On the other hand, for many indicators Governance sustainability of this agrarian region is at Satisfactory level, efficiency of governance system in that region's agriculture being close to Unsatisfactory level for Agrarian administration efficiency, and Unsatisfactory for Management Board external control.

South-Central Region" agriculture is only in solid Good territories for two Indicators – Administration service costs and Prices negotiation possibilities (Figure 17). At the same time, Governance sustainability of the sector is at Satisfactory level for numerous Indicators being close to Unsatisfactory level for Agrarian administration efficiency, Administrative services digitalisation and Market access difficulties. On top of that, Governance sustainability of region's agriculture is Unsatisfactory in terms of Farmer's participation in decision-making and Management Board external control.

Governance sustainability of South-East Region agriculture is with relatively Good Indicators only with respect to Administration service costs and Extent of awareness (Figure 17). In many other areas Governance sustainability of this agrarian region is at Satisfactory level. What is more, for Management Board external control the Governance sustainability is at Unsatisfactory territory.

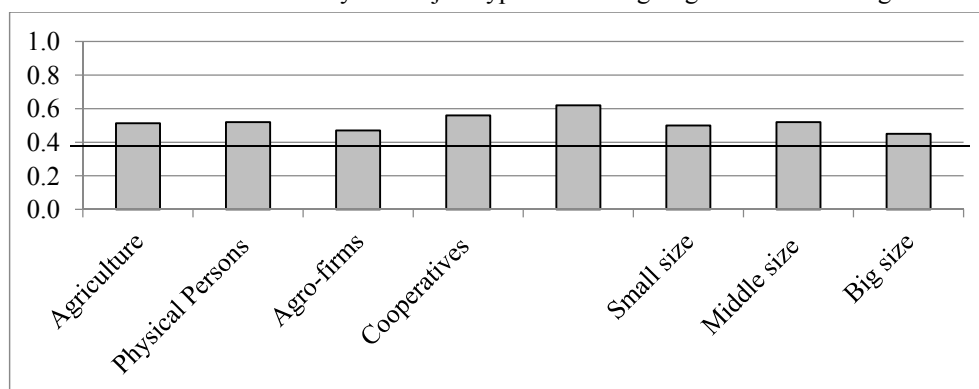
Governance Sustainability for Major Types of Bulgarian Farms

Suggested approach let assess what is Governance sustainability for the various farming structures in the country, and how dominating institutional environment and modes of governance affect (contribute 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. Governance sustainability of agriculture is the highest for Semi-market (Mainly subsistence farms) and cooperative (Cooperatives) sectors – Integral Governance Sustainability Index for these type of farming organisations is much higher than sectoral average (Figure 18). Other main juridical type of farms like Physical Persons and Middle size farming enterprises also have higher than average Governance Sustainability Index. Thus, all these four types of farming organisations contribute to the greatest extent to increasing (maintaining) the Good Governance sustainability of Bulgarian agriculture.

At the same time, for Small size farms Governance sustainability is below national one and at the border with Satisfactory level. Furthermore, for Agro-firms and Big size farming enterprises Governance sustainability is at Satisfactory level. Consequently, these major type of farming enterprises diminish to the greatest extent the overall Governance sustainability of country's agriculture.

Figure 18
Governance Sustainability for Major Type of Farming Organisations in Bulgaria



Source: farm survey.

Principles of Governance sustainability are applied (“work”) differently in relations to various type of Bulgarian farms. Governance Sustainability Principles Good legislative system, Democratic management and Good private practices the most favourably affect Cooperatives and Mainly subsistence farms (Figure 19). Governance Sustainability Principle Working agrarian administration is most effectively implemented in regards to Mainly subsistence holdings, Physical Persons and Middle size farms. Governance

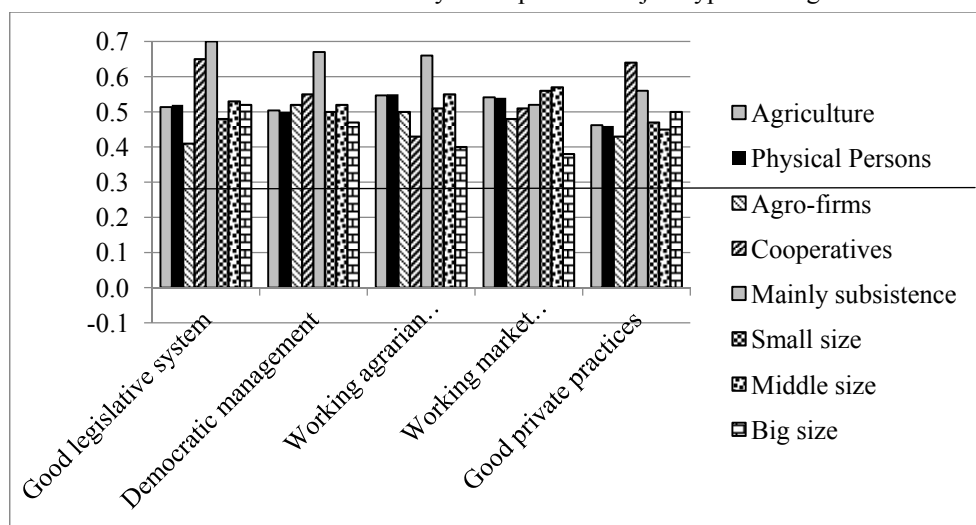
Sustainability Principle Working market environment is more favourable for Middle size and Small size farms.

On the other hand, individual Principles for Governance sustainability of agriculture are worse applied in and adversely impact the different type of farms. Sustainability for the Good legislative system Principle is at Satisfactory level for Agro-firms and Small size farms. Sustainability principle Democratic management is at Satisfactory level only for Big size farming enterprises. Implementation of principle Working agrarian administration is inferior (Satisfactory) for Big size farms and Cooperatives; sustainability principle Working market environment does not work well for 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.

Governance sustainability of agriculture carried out in the farms of Physical Persons is very Good in terms of Administration service costs, Extent of awareness, Access to information, Market competition, and Extent of competitive allocation of public resources (Figure 20). At the same time, governance system for this farms work only Satisfactory in respect to Farmer's participation in decision-making, Agrarian administration efficiency, Administrative services digitalisation, Possibility for lands extension, Management Board external control, Level of informal system efficiency, Subsidies in Income, and Extent of contract enforcement.

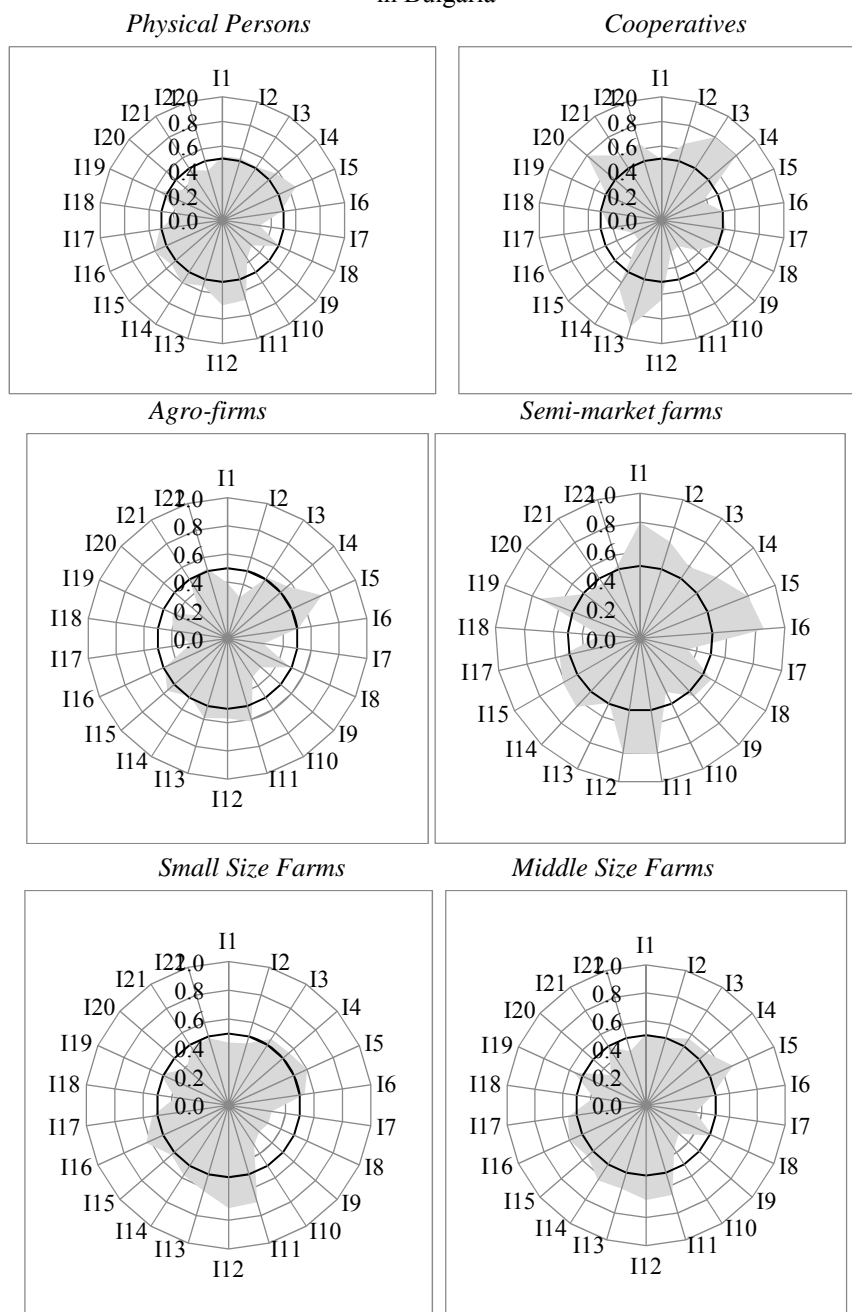
Figure 19

Indices of Governance Sustainability Principles for Major Type of Bulgarian Farms

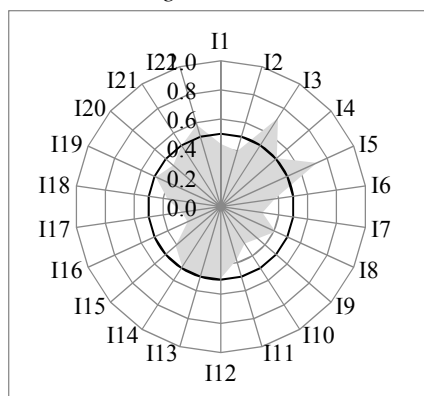


Source: farm survey.

Figure 20
Impact of (Contribution to) Governance Sustainability Indicators of Major Type of Farms
in Bulgaria



Big Size Farms



Source: farm survey.

Governance sustainability of agriculture in the cooperative sector (Cooperatives) is quite High for Market access difficulties (Figure 20). Cooperative farms also are in very favourable (Good but at border with High level) situation for three Indicators: Subsidies distribution, Management Board external control, and Representativeness of state and local authorities, as well with a very Good level for several other areas. Simultaneously, Governance sustainability for cooperatives agriculture is Satisfactory for Access to information, Agrarian administration efficiency, Lands concentration, Extent of CAP implementation, Acceptability of legal payments, Possibility for lands extension, and Extent of regulations implementation. What is more, Governance sustainability in the area of Extent of awareness is very close to Unsatisfactory level while for three Indicators it is Unsatisfactory – Administrative services digitalisation, Prices negotiation possibilities, and Extent of competitive allocation of public resources.

Governance sustainability in Agro-firms is only relatively Good for Access to information and Extent of awareness (Figure 20). On the other hand, for numerous Indicators the level of agrarian Governance sustainability in the corporate sector is Satisfactory, namely Extent of beneficiary satisfaction of EU policies, Agrarian administration efficiency, Administrative services digitalisation, Extent of CAP implementation, Possibility for lands extension, Extent of regulations implementation, Acceptability of legal payments, Market competition, and Extent of competitive allocation of public resources. Furthermore, the level of governance efficiency is very close to Unsatisfactory level for Farmer's participation in decision-making and Lands concentration, and it is Unsatisfactory for Management Board external control.

Diverse aspects of Governance sustainability of agriculture carried out in farming organisations of different size is also characterised with a great variation. In Semi-market sector (Mainly Subsistence farms) it is High for Subsidies in Income and Extent of awareness, and at the border with superior level for Extent of CAP implementation, Access to information, and Administration service costs (Figure 20). Governance sustainability for this major type of farming organisations is also very Good in terms of Extent of regulations

implementation, and Extent of beneficiary satisfaction of EU policies. At the same type, Governance sustainability in the huge “semi” market sector of Bulgarian agriculture is at Satisfactory level for Farmer’s participation in decision-making, Administrative services digitalisation, Extent of contract enforcement, Market access difficulties, and Management Board external control, and quite low for Possibility for lands extension.

Governance sustainability in Bulgarian small scale agriculture (Small Size Farms) is very Good in regards to Administration service costs and Extent of awareness (Figure 20). On the other hand, Governance sustainability in that dominant sector of agriculture is at Satisfactory level in multiple directions – Farmer’s participation in decision-making, Acceptability of legal payments, Administrative services digitalisation, Possibility for lands extension, Management Board external control, Extent of CAP implementation, Extent of beneficiary satisfaction of EU policies, Extent of contract enforcement, Level of informal system efficiency, being particularly low for Agrarian administration efficiency.

Governance sustainability of agriculture in Middle Size Farms is quite Good for Access to information, Administration service costs, Extent of awareness, Market competition, Market access difficulties and Extent of competitive allocation of public resources (Figure 20). Simultaneously, sustainability is Satisfactory in several key areas – Agrarian administration efficiency, Management Board external control, Farmer’s participation in decision-making, Administrative services digitalisation, Possibility for lands extension, Level of informal system efficiency and Subsidies in Income.

Governance sustainability of agriculture in the large scale enterprises (Big Size Farms) is favourably Good in respect to two areas – Subsidies distribution and Access to information. However, for many indicators, Governance sustainability for this type of farming organisations are at Satisfactory level. Moreover, Governance efficiency for this large “subsector” of Bulgarian agriculture is close to or at Unsatisfactory level for Extent of competitive allocation of public resources, Lands concentration, and Farmer’s participation in decision-making.

Conclusions

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

This first in a kind comprehensive assessment of the Governance sustainability of Bulgarian agriculture lets make some important specific conclusions about the state of (Governance) sustainability of diverse agro-systems, and recommendations for improvement of the managerial and assessment practices. Elaborated and experimented holistic approach gives a possibility to improve the overall and governance sustainability

assessment. Therefore, it has to be further discussed, experimented, improved and adapted to the specific conditions of evaluated agricultural systems and needs of decision-makers at different levels.

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 Satisfactory level. Besides, there is a considerable differentiation in the level of Integral Governance sustainability of different agro-systems in the country – agricultural sub-sectors, agro-ecosystems, agro-regions, and type of farming organisations. What is more, individual indicators with the highest and lowest sustainability values determine the “critical” factors enhancing or deterring the particular and integral Governance sustainability of evaluated agro-system. Last but not least important, 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” estimates of interviewed agents. For instance, for some highly “sensitive” questions in the conducted (“anonymous”) survey, many 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 agrarian sustainability in general, and Governance sustainability of agriculture in particular, they are to be expended and their precision and representation increased. The later requires improvement of precision through enlargement of surveyed farms and stakeholders and incorporating more “objective” data from surveys, statistics, expertise of professionals in the area, etc.

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