

Original Research Article

Governance Sustainability of Bulgarian Agriculture at Ecosystem Level

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Abstract: This paper evaluates the level of governance sustainability of major agro-ecosystems in Bulgaria, and its “contribution” to the integral sustainability of respective agro-ecosystems. Modern achievements of the theories of Sustainable Development and New Institutional Economics are incorporated, and a holistic hierarchical system of Principles, Criteria, Indicators, and Reference Values for assessing Governance and Integral sustainability of agro-ecosystems in Bulgarian elaborated and empirically tested. Assessment has found out that there is a considerable differentiation in the level of Governance sustainability of different agro-ecosystems in the country with the highest (“Good”) demonstrated by agro-ecosystems with “Lands in protected zones and territories” and those in “Less-favored mountainous” regions, while agro-ecosystems “Mainly plain” and “Less-favored non-mountainous” regions are lowest and bellow national, second one being at Satisfactory level. Inclusion of the “Governance Pillar” affects unequally the Integral Sustainability of different agro-ecosystem. While for agroecosystem in “Less-favored mountainous” region calculations with and without governance pillar are almost the same, for other agro-ecosystems inclusion of the governance dimension decreases the overall sustainability.

Keywords: governance sustainability, assessment, agro-ecosystems, Bulgaria.

INTRODUCTION

Most modern systems for assessing agrarian sustainability widely incorporate three “dimensions” or “pillars” of sustainability - economic, social and environmental [1-12]. In the past years a “fourth” - governance pillar has been increasingly included in sustainability concept both by scientists [13-19] as well as governmental, community, professional, international, and private organizations [20-27].

The few existing systems for governance sustainability measurement focus entirely of national and international level without taking into consideration the specificity of individual (e.g. agricultural) sectors and specificity of diverse (agro)ecosystems. Often the governance sustainability is evaluated qualitatively or in expect way without applying any consistent methodology, first-hand information, and quantitative methods. A holistic approach for assessment is not applied, and different sustainability pillars are evaluated independently. Often individual indicators for sustainability assessment are “arbitrary” selected and no system for integration of diverse indicator incorporated.

In Bulgaria, there are few studies on governance sustainability in general [21] and in agrarian sector in particular [28]. Most sustainability assessments of agro-systems are three-pillar’s including national, sectoral, ecosystem, regional and farm levels [29, 32]. There are very few assessments on governance sustainability of agriculture focusing mostly on national, (sub) sectoral, territorial and farm levels [30, 31, 33]. Practically there are no comprehensive assessments of the governance sustainability at important agro-ecosystem level. At the same time, recent studies found out a great variation in the efficiency of the specific governance systems in principal agro-ecosystems of the country [34, 35].

This paper presents the result of the first attempt to evaluate the level of governance sustainability of major type of agro-ecosystems in Bulgaria, and the governance pillar “contribution” to the integral sustainability of major agro-ecosystems of the country.

RESEARCH DATA AND METHODS

In this study we perceive sustainability of agriculture as a “system characteristic”, and “ability to continue over time” and maintain its governance, economic, social and environmental functions [36]. Agrarian sustainability has four aspects (“pillars”) which are equally important – governance, economic, social, and environmental. The “governance sustainability” characterizes the efficiency of the specific system of governance in an evaluated agro-system (EU, national, subsector, ecosystem, regional, farming organization) [37]. Accordingly, a “good governance” means a superior governance sustainability, while a “bad” (inefficient) governance corresponds to inferior governance sustainability.

The system of governance of a particular agro-system includes a number of district components all of which have to be included in 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”) [38].

In order to assess the governance and overall sustainability of Bulgarian agriculture (and its composite elements like agro-ecosystems, etc.) a hierarchical system of Principles, Criteria, Indicators, and Reference Values for each Aspect (Pillar) of sustainability is elaborated. That approach is based on well-known SAFE framework [9], as specificity of its adaptation to the conditions of Bulgarian agriculture and incorporation of a new (governance) pillar are presented in details in other publications [32, 28, 34, 36].

The *Governance Sustainability Principles* are “universal” and represent the states of sustainability, which is to be achieved (Figure 1). 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 governance are identified: “Good legislative system”, “Democratic management”, “Working agrarian administration”, “Working market environment”, and “Good private practices”.

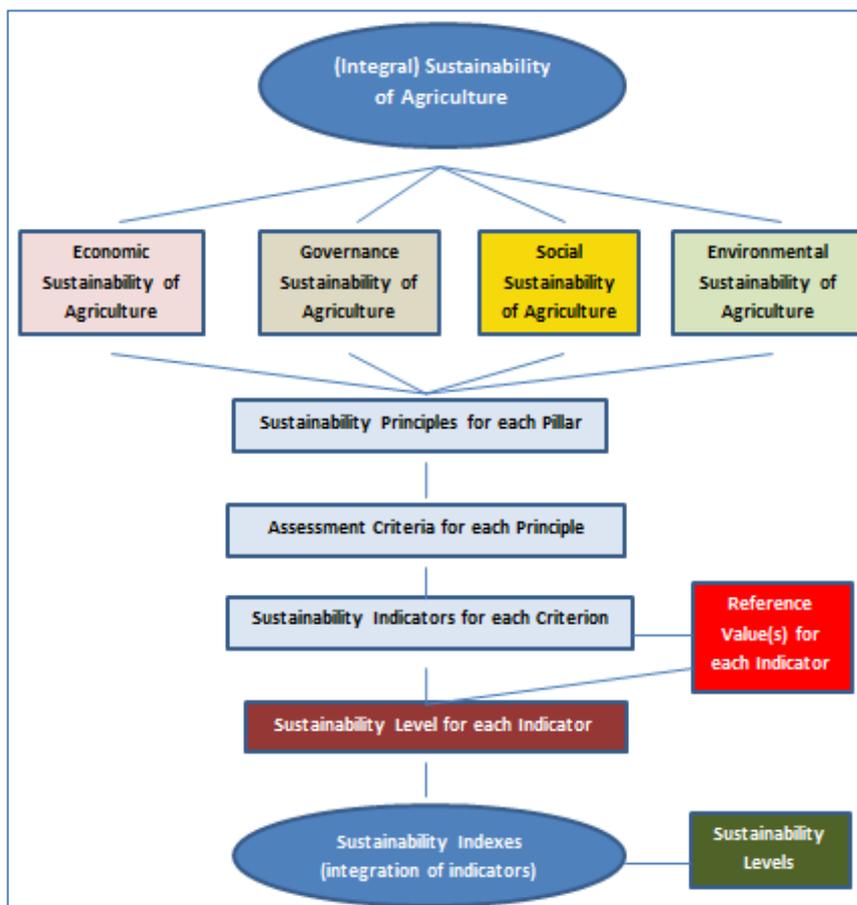


Fig-1: Framework for Assessing Sustainability of Bulgarian Agriculture
Source: author

The *Governance Sustainability Criteria* are precise standards for each Principle representing a resulting state of the evaluated system when the relevant sustainability Principle is realized. For the contemporary conditions of the

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: “Harmonization 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 which can be assessed in the specific conditions of evaluated agro-system allowing measurement of compliance with a particular Criterion. For assessing the Governance sustainability of the Bulgarian agriculture at eco-system level a system of 22 Indicators are specified. For instance, for the Criteria “Policies effects” an Indicator “Level of subsidies comparing to the average for the sector” is selected.

For assessing the particular sustainability level, a system of *Reference Values* (sustainability norms, range, and standards) for each Indicator are to be used. Depending on the extent of the Reference value achievement, the evaluated agro-ecosystem may be with a “high”, “good”, or “low” sustainability, or be “unsustainable”. For instance, agrarian system with a higher than the sectoral public support (level of subsidies) is more sustainable then others as far as “Policy effects” are concerned, and vice versa.

Since individual Indicators for each Criterion and/or different Criteria, and Principles of sustainability are often with unequal, and frequently with controversial levels, diverse (quantitative and qualitative) levels for each Indicator are transformed into Index of sustainability (ISi) applying appropriate scale for each Indicator [35].

The Integral Sustainability Index for a particular Criterion, Principle, and Pillar of sustainability, and the 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 Pillar of sustainability. Using “equal” rather than differentiated weight is determined by the fact that individual Sustainability Pillars, 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 Criteria is difficult to justify as well unimportant for the Integral assessment having in mind the big number and small relative contribution of each Indicator.

The Integral Index for a particular Criterion, Principle, and Pillar of sustainability, and the Integral Sustainability Index are arithmetic averages of the Indices of composite Indicators, Criteria and Principles.

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 [35] 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.

In Bulgaria there are no official data for calculating most of the governance, socio-economic and environmental sustainability indicators at eco-system level. Therefore, elaborated holistic framework for assessing the Governance and Integral sustainability is tested using 2018 survey data from the managers of 208 “typical farms” of different type in all major agro-ecosystems of the country – Plain, Plain-Mountainous, Mountainous, Less-favored Mountainous, Less-favored Non-mountainous, and Lands in Protected Zones and Territories. The composite (Pillar and Integral) Sustainability Index of each evaluated agro-ecosystem is calculated as an arithmetic average of the Indices of relevant farms belonging to that system.

RESEARCH RESULTS

A multiple indicators assessment of the Governance sustainability level of Bulgarian agriculture indicates that the Index of Overall Sustainability is 0,51 - this represents a close to the “Satisfactory” but still a “Good” level of Governance sustainability of the sector (Figure 2).

The Governance sustainability of principle agro-ecosystems in Bulgaria demonstrates a great variation as the highest (“Good”) ones are registered for the agro-ecosystems with “Lands in protected zones and territories” (0,53) and those in “Less-favored mountainous” regions (Figure 2). At the same time, the Governance sustainability of two agro-ecosystems - “Mainly plain” (0,5) and “Less-favored non-mountainous” (0,49) are below the national (sectoral) average, the second one being at inferior (“Satisfactory”) level. Therefore, the latter two type of agro-ecosystems decrease to the biggest extent the Integral Governance sustainability of Bulgarian agriculture.

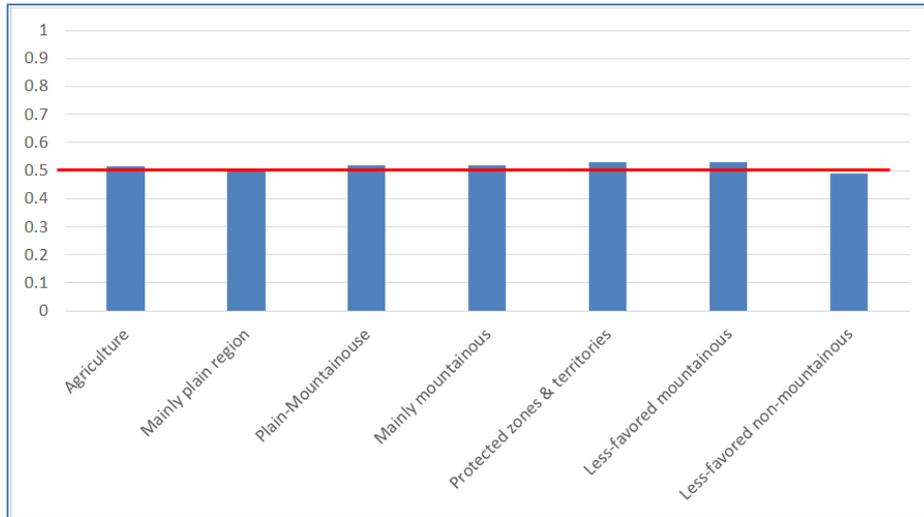


Fig-2: Governance Sustainability of Agriculture and Major Agro-ecosystems in Bulgaria
 Source: survey with farm managers

Analysis of individual Indexes for the primary sustainability Principles and Indicators allows identifying individual components contributing to the Governance sustainability of Bulgarian agriculture and different agro-ecosystems in the country. 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 [33]. 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.

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 3).

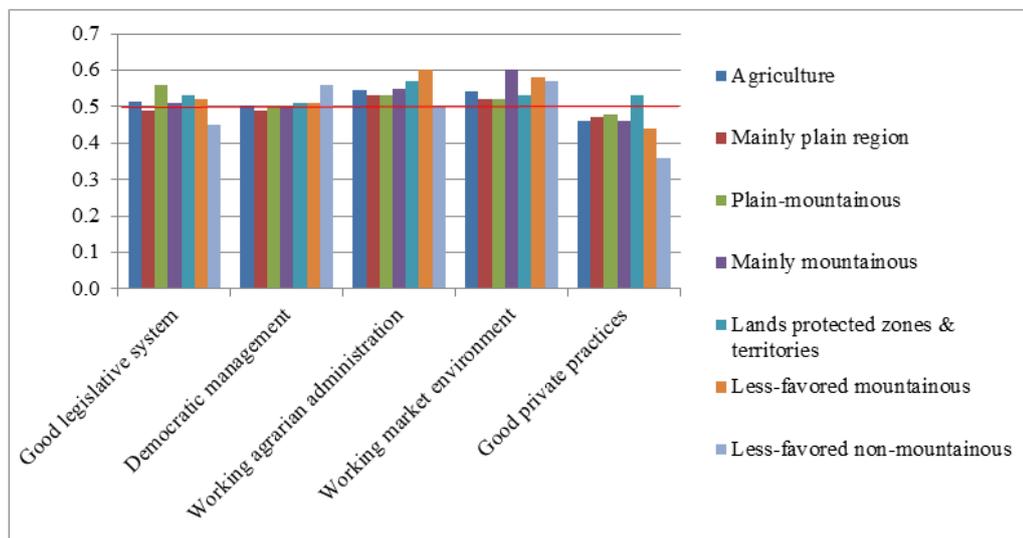


Fig-3: Indices of the Principles of Governance Sustainability in Major Agro-ecosystems in Bulgaria
 Source: Survey with farm managers

The principle “Good legislative system” is the best implemented at “Good” level in the “Plain-mountainous” agro-ecosystems (0,56), while in the “Less-favored non-mountainous” (0,45) and “Mainly plain” regions it is at “Satisfactory” level (0,49). On the other hand, the principle of “Democratic management” is the best realized in “Less-favored non-mountainous” agro-ecosystems (0,56), in the most other type it is the same or close to the sectoral average (0,5), and in the “Mainly plain” regions it is at “Satisfactory” level (0,49).

Furthermore, the principle “Working agrarian administration” is better applied in the agro-ecosystems in “Less-favored mountainous” regions (0,6), those with “Lands in protected zones and territories” (0,57), and in “Mainly

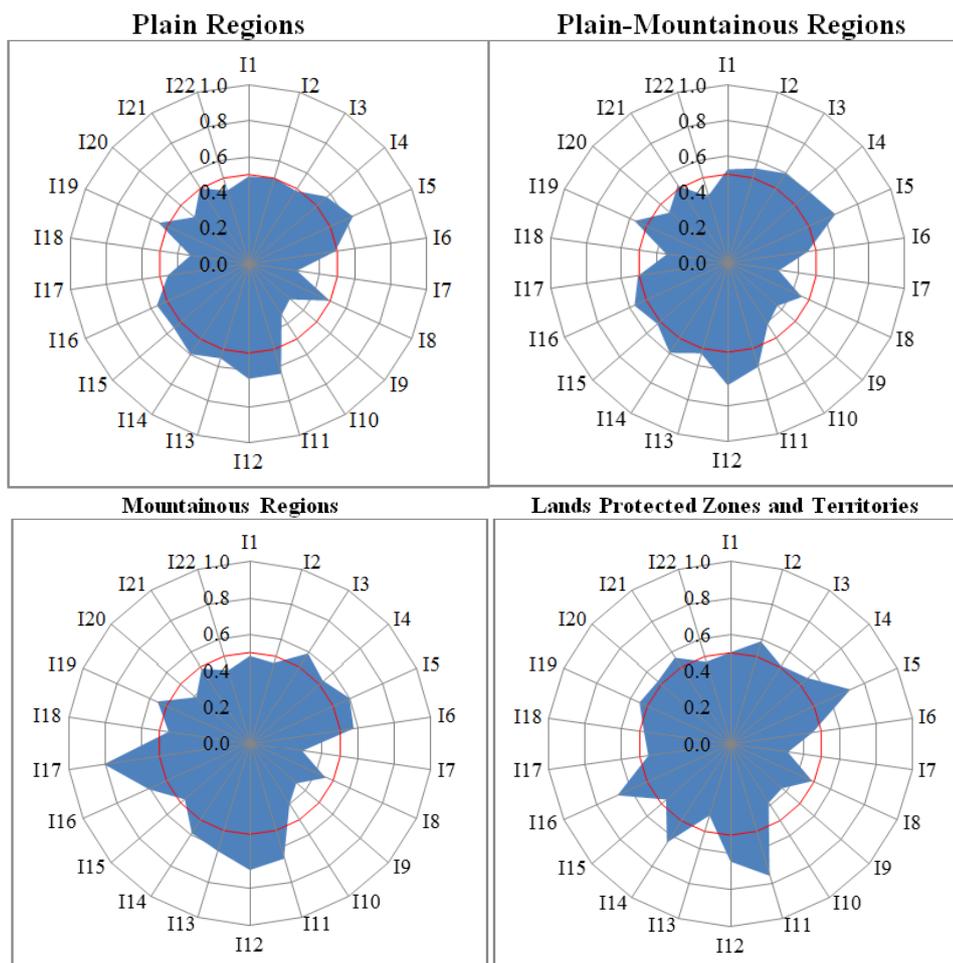
mountainous” regions (0,55) while in all other types it is in below the national level. Similarly, the Principle “Working market environment” is with the highest value in the agro-ecosystems in “Mainly mountainous” regions (0,6), “Less-favored mountainous” regions (0,58), and “Less-favored non-mountainous” regions (0,57), 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” (0,53), 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 (0, 36).

Individual sustainability Indicators give precise information about the specific factors determining one or another values of a particular Principle. (Figure 9). 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 management strategies. On the other hand, the higher levels of certain Indicators show the absolute and comparative advantages of the Bulgarian agriculture in terms of good governance and sustainable development.

Individual Indicators for the Governance sustainability of specific agro-ecosystems of the country have quite different values. Sustainability of the agro-ecosystems in “Mainly plain” regions are with the highest governance Indicators for: “Access to information” (0,64), “Extent of awareness” (0,64), “Administration service costs” (0,64) and “Market competition” (0,6) (Figure 4).

At the same time, multiple factors associated with the imperfections in the governance system are “Satisfactory” decreasing the (Governance) sustainability of these agro-ecosystems: “Possibility for lands extension” (0,33), “Administrative services digitalization” (0,34), “Management Board external control” (0,4), “Level of informal system efficiency” (0,43), “Lands concentration” (0,45), “Extent of CAP implementation” (0,49), “Subsidies distribution” (0,49), “Subsidies in Income” (0,49). Particularly low in this important areas are the Indices for the “Farmer’s participation in decision-making” (0,27) and “Agrarian administration efficiency” (0,3).



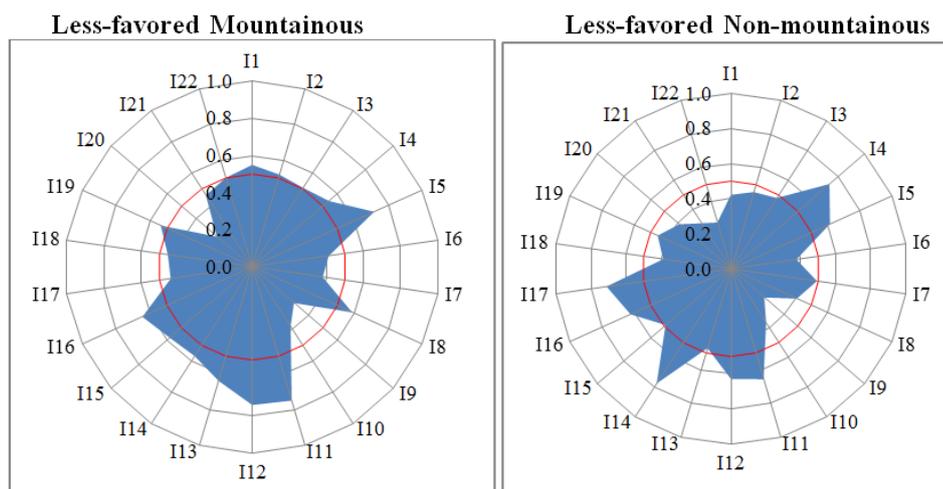


Fig-4: Governance Sustainability Indicators* in Different Agro-ecosystems in Bulgaria
 Source: survey with farm managers

*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.

The greatest Governance sustainability Indicators for the agro-ecosystems in the “Plain-Mountainous Regions” of the country are: “Administration service costs” (0,69), “Access to information” (0,66), “Extent of awareness” (0,61), “Representativeness of state and local authorities” (0,61), “Subsidies distribution” (0,6), and “Market competition” (0,6) (Figure 4). Simultaneously, for a number of key Indicators level of Governance sustainability is “Satisfactory”: “Possibility for lands extension” (0,35), “Agrarian administration efficiency” (0,37), “Level of informal system efficiency” (0,39), “Administrative services digitalization” (0,41), “Management Board external control” (0,43), “Subsidies in Income” (0,45), and “Acceptability of legal payments” (0,46), being particularly inferior for the “Farmer’s participation in decision-making” (0,29).

The Governance sustainability of the agro-ecosystems in “Mountainous Regions” is enhanced mostly by the “Quality of services” (0,7), “Information availability” (0,66), “Market access” (0,62), “Resource concentration” (0,63), “Competitive allocation of public resources” (0,61), and “Transparency” (0,6) (Figure 15). On the other hand, the Governance sustainability of these agro-ecosystems is at “Satisfactory” level for the “Access to administrative services” (0,37), “External control” (0,39), “Informal system efficiency” (0,42), “Extent of policies implementation” (0,48), “Extent of beneficiary satisfaction of EU policies” (0,46), “Minimum costs of using” (0,46) and “Contracts enforcement” (0,49), and particularly compromised as far as the “Stakeholder participation in decision-making” is concerned (0,29).

Agro-ecosystems with “Lands in Protected Zones and Territories” are with a very “Good” Governance sustainability for “Information availability” (0,75), “Transparency” (0,72), “Competitive allocation of public resources” (0,68), “Quality of services” (0,65) (Figure 4). On the other hand, the governance sustainability of these agro-ecosystems is inferior in a number of areas: “Stakeholder participation in decision-making” (0,32), “Access to administrative services” (0,38), “Market access” (0,41), “Impact” (0,45), “Resource concentration” (0,47), “Informal system efficiency” (0,47), and “Minimum costs of using” (0,49).

“Less-favored Mountainous” agro-ecosystems are with quite “Good” Governance sustainability for the “Information availability” (0,75), “Quality of services” (0,74), “Transparency” (0,72), “Competitive allocation of public resources” (0,65), “Market access” (0,64), and “Free competition” (0,58) (Figure 4). At the same time, the Governance sustainability of these agro-ecosystems is “Satisfactory” in terms of: “Access to administrative services” (0,34), “Stakeholder participation in decision-making” (0,38), “Impact” (0,41), “Resource concentration” (0,45), and “Contracts enforcement” (0,46). Besides, these type of agro-ecosystems are with “Unsatisfactory” Governance sustainability as far as the “Management Board external control” is concerned (0,25).

Finally, the agro-ecosystems in “Less-favored Non-mountainous” regions are with very “Good” sustainability for the “Market competition” (0,78), “Representativeness of state and local authorities” (0,74), “Lands concentration” (0,71), “Extent of awareness” (0,66), “Administration service costs” (0,63), “Extent of competitive allocation of public resources” (0,63), and “Access to information” (0,62). On the other hand, for all other Indicators the Governance sustainability of this specific agro-ecosystem is “Satisfactory”, and for the “Agrarian administration efficiency” even “Unsatisfactory” (0,25).

The inclusion of the “Governance Pillar” in the sustainability calculations changes insignificantly the Integral Sustainability Index of Bulgarian agriculture without modifying the overall (“Good”) sustainability level of the sector (Figure 5). However, while for the agroecosystem in Less-favored mountainous region calculations with and without governance pillar are almost the same, for other major agro-ecosystems of the country inclusion of the governance dimension decreases overall sustainability of respective systems. Thus, inclusion of the missing “new” and important Governance aspect is crucial since it ameliorates adequacy and precision of the sustainability assessments at agro-ecosystem level.

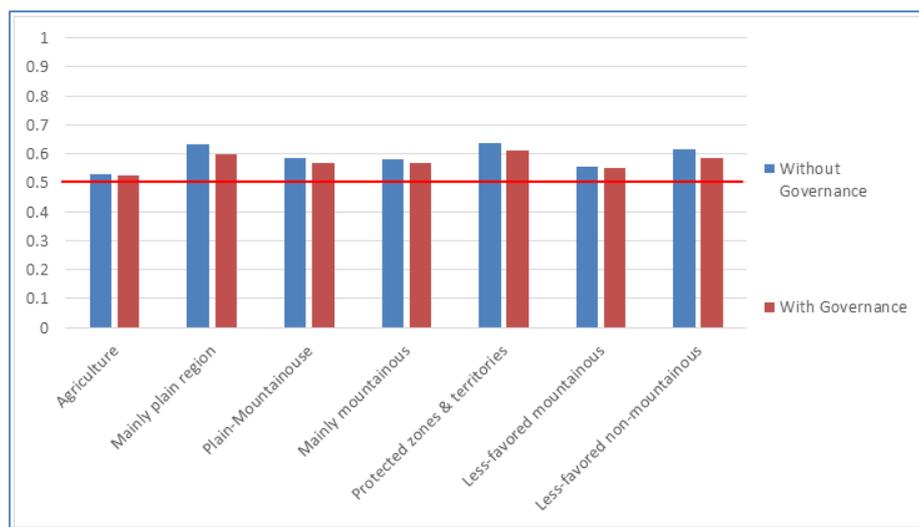


Fig-5: Integral Sustainability of Agriculture and major Agro-ecosystems in Bulgaria with and without inclusion of Governance Pillar

Source: survey with farm managers

CONCLUSIONS

This study has proved that it is important to measure the “missing” Governance Pillar of sustainability of agro-ecosystems of different type. Multi-Indicators assessment of the Governance sustainability of principle agro-ecosystems in Bulgaria has found out that there is a considerable differentiation in the level of Integral Governance sustainability of different agro-ecosystems in the country. The highest (“Good”) governance sustainability is demonstrated by the agro-ecosystems with “Lands in protected zones and territories” and those in “Less-favored mountainous” regions. At the same time, the Governance sustainability of agro-ecosystems “Mainly plain” and “Less-favored non-mountainous” regions are below the national average, the second one being at “Satisfactory level. The individual indicators with the highest and lowest sustainability values determine the “critical” factors enhancing and deterring the particular and integral Governance sustainability of evaluated agro-ecosystem. Principally, there is a great potential for improvement of governance efficiency and elevate the Governance and Overall sustainability in agriculture and its different agro-ecosystems.

The inclusion of the “Governance Pillar” in the sustainability calculations changes insignificantly the Integral Sustainability Index of different agro-ecosystem. However, while for the agroecosystem in Less-favored mountainous region calculations with and without governance pillar are almost the same, for other major agro-ecosystems of the country inclusion of the governance dimension decreases the overall sustainability of respective systems. Thus, inclusion of the missing “new” and important Governance aspect is crucial since it ameliorates adequacy and precision of the sustainability assessments at agro-ecosystem level.

Having in minded the importance of holistic assessments of this kind for improving the agrarian sustainability in general and the Governance sustainability of agriculture in particular, they are to be expended and their precision and representation increased. Suggested framework 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. Furthermore,

precision of assessments has to be improved through enlargement of the number of surveyed farms, stakeholder's involvement, and more "objective" data from surveys, statistics, expertise of professionals in the area, etc.

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