Sustainability of Farming Enterprises in Bulgaria

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By

Hrabrin Bachev

Cambridge
Scholars
Publishing

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This book first published 2018

Cambridge Scholars Publishing

Lady Stephenson Library, Newcastle upon Tyne, NE6 2PA, UK

British Library Cataloguing in Publication Data
A catalogue record for this book is available from the British Library

ISBN (10): 1-5275-1126-X
ISBN (13): 978-1-5275-1126-2

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PREFACE

Around the globe understanding and assessment of sustainability of farming enterprises is among the most topical issues for researcher, farmers, investors, administrators, policy-makers, interests groups and public at large. At the current stage of development and reforming of European and Bulgarian agriculture the question about "the level of sustainability of different type of farming enterprises during EU CAP implementation" is particularly topical.

Despite enormous progress in the theory and practice of assessment of farm sustainability, still there is no consensus on "what is sustainability of farming enterprises", "what is the relation between farm and agrarian sustainability", "which are the critical factors of farm sustainability", and "how to evaluate sustainability level of farming enterprises" in a dynamic world, where hardly there is anything actually "sustainable".

Most of the suggested and used frameworks for sustainability assessment apply an "universal" approach for "faceless" farming enterprises, without taking into consideration the specificity of individual holdings (like type, resource endowment, specialization, stage of development, etc.) and the environment in which they function and evolve (e.g. competition, institutional support and restrictions, environmental challenges and risks, etc.). What is more, the majority of available systems cannot be practically used by the farmers and managerial bodies, since they are difficult to understand and employ in everyday activity.

Our motivation to write this book was to respond to the great theoretical and practical needs for modern understanding and assessment of sustainability of farming enterprises. We extend our previous research on agrarian governance and sustainability, incorporate the latter developments in the area, and suggest an interdisciplinary, holistic and practical approach for assessing sustainability of farming enterprises, including important governance and institutional aspects. Furthermore, we apply that new approach in a large scale study in Bulgaria and assess overall, governance, economic, social and environmental sustainability of farming enterprises of different juridical type, size, production specialization, and ecological and geographical location. We also identify factors and perspectives for farm enterprises sustainability, and specify directions for further research, and amelioration of farm management and public intervention in the sector.

We follow strictly academic precisions while our findings are presented in an easily understandable way in order to reach a large audience of researchers, educators, students, experts, farmers, businessmen, administrators, policy makers, professionals, non-governmental and international organizations, and public at large.

We would like to express our gratitude to all colleagues of different disciplines, institutions and countries, who have been helping us "understand" the big problem of agrarian and farm sustainability and the process of their assessment and governance. We also want to thank numerous managers of farming enterprises of different type from various countries for priceless "lessons" on farm sustainability and provided information. Without contribution of all of them this "long" study would not have ended and this book written. Finally, we are enormously thankful to Cambridge Scholars Publishing for giving us the extraordinary opportunity to present our work to the larger world audience.

Hrabrin Bachev
May 24, 2017

INTRODUCTION

The issue of assessment of sustainability of farming enterprises is among the most topical for researcher, farmers, investors, administrators, policy-makers, interests groups and public at large around the globe (Andreoli and Tellarini, 2000; Bachev, 2005, 2006, 2016; Bachev and Petters, 2005; Bachev et al., 2016; Bastianoni et al., 2001; Candido et al., 2015; EC, 2001; FAO, 2013; Fuentes, 2004; Häni et al., 2006; OECD, 2001; Rigby et al., 2001; Sauvenier et al., 2005; UN, 2015).

For instance, at current stage of the European Union (EU) Common Agricultural Policy (CAP) implementation in the individual member states are very important following questions: how to assess sustainability levels of different governance structures - farming enterprises on different type; to what extent various mechanisms and instruments of the Common policies of the Union affect sustainability of diverse type of farming enterprises; and how to improve sustainability of farming enterprises through effective changes in management strategies and forms of public intervention in the sector. Nevertheless, in Bulgaria, like in many other countries, there are no or few comprehensive studies on sustainability of farms during reformed EU CAP implementation (Bachev, 2017).

Despite the enormous progress in the theory and practice in that new evolving area, still there is no consensus on "what is (how to define) sustainability of farming enterprises", "what is the relation between the farm and the agrarian sustainability", "which are the critical factors of farm sustainability", and "how to evaluate the sustainability level of farming enterprises" in a dynamic world, where hardly there is anything actually "sustainable".

All these questions are a part of a more general problem for defining and assessing agrarian sustainability as a whole, which leads to a suggestion "to spend less time in attempts to define sustainable agriculture and more time working on its achievement" (Ikerd, 2016). But is it possible to work for sustainable agriculture without first defining it? Disagreements among experts are mostly associated with the "approaches for assessment" of sustainability levels, "modes of governance" of agrarian sustainability, and "means" for achieving sustainable agriculture, rather than the sustainability "goals" towards efforts have to be directed.

In academic publications, official documents and agricultural practices there is a clear understanding that "farms sustainability and viability" is a

condition and an indicator for agrarian sustainability and achievement of sustainable development goals. Also it is widely accepted that in addition to "pure" production and economic dimensions, the farm sustainability has broader social and ecological aspects, which are equally important and have to be taken into account when measure the overall sustainability level. There are suggested and used numerous indicators for assessing agrarian sustainability at "farm level" and diverse approaches for their integration and interpretation (Sauvenier et al., 2005). In the past two decades in Bulgaria there have been more talks about farm sustainability than efforts to make comprehensive assessments on its level (Bachev, 2016).

However, most of the assessments of agricultural sustainability are at industry, national or international level (EU, 2001; FAO, 2013; OECD, 2001), while the important "farm level" is usually missing. Simultaneously, there are many systems putting individual "parcel" as the lowest level for sustainability assessment. Consequently, the important links between sustainability governance and sustainability levels are not properly studied (Bachev, 2010), neither relations between farm management and impacts on agro-ecosystems and their sustainability are clarified (Sauvenier et al., 2005).

Besides, often the estimates of farms sustainability and agrarian sustainability unjustifiably are equalized. Agrarian sustainability has larger dimensions and in addition to the sustainability of certain type of farming enterprises ("family", "cooperative", "community" etc. farms) includes: the importance of individual (type of) farms in the overall resources management and the socio-economic life of households, region and industry; and the collective actions of diverse agrarian agents; and the overall (agrarian) utilization of resources and the impacts on natural environment; and the amelioration of living and working conditions of farmers and farm households; and the overall state and development of agriculture and rural households; and the (participation in) overall social governance; and the food security, and the conservation of agrarian capability, traditions, etc. (Bachev, 2015).

For example, the experience around the globe shows, that there are many "highly" sustainable farming enterprises little contributing to agrarian sustainability – numerous "semi-market" holdings and subsistence farms, large enterprise based on leased-in lands, public farms etc. in Bulgaria with "low" standards for environmental protection (Bachev, 2010). On the other hand, sustainable agrarian development is commonly associated with the restructuring and adaptation of farming enterprises to constantly evolving market, institutional, and natural

environment. That process (pre)determines the low sustainability (non-sustainability) and the diminishing importance of farming enterprises of certain type (public, cooperative, small-scale), and the modernization of another part of them through diversification of activity, transformation of family farms into partnerships, firms, vertically-integrated forms, etc.

Furthermore, in most cases a holistic approach is not applied, and the "pure" economic (income, profitability, financial independence, etc.), "pure" production (land, livestock and labor productivity, eco-conservation technologies, etc.), "pure" ecological (eco-pressure, harmful emissions, eco-impact etc.), and "pure" social" (social responsibility, social contribution) aspects of farm development are studied (assessed) independently from one another. In most of the available frameworks for assessing sustainability level there is no hierarchical structure or systemic organization of the aspects and the components of farm sustainability, which (pre)determines the random selection of sustainability indicators.

Also the critical "governance" functions of the farm, and the costs associated with the governance (known as "transaction costs"), and the relations between different aspects of farm sustainability are mostly ignored (Bachev, 2004; Bachev and Petters, 2005). Nevertheless, very often the level of the managerial (governance) efficiency and the adaptability of farm predetermine the overall level of sustainability independent from the productivity, social or ecological responsibility of activity.

Now it is broadly recognized that the farm "produces" multiple products, "private" and "public" goods such as food, rural amenities for hunting, tourism, landscape enjoyment, environmental and cultural services, habitat for wild animals and plants, biodiversity, including less desirable ones such as waste, harmful impacts, etc. Therefore, all these socio-economic and ecological functions of the farm have to be taken into account when assessing farm sustainability.

The farm is not only a major production but an important governance structure for organization (coordination) of activities and transactions in agriculture, with a great diversity of interests, preferences, goals, skills, etc. of participating agents (owners, managers, workers, etc.) (Bachev, 2004). Therefore, when assessing sustainability and efficiency of different type of farms (subsistent, member-oriented, profit-making, part-time employment, conservation, etc.) it has to be also taken into account their comparative potential in relation to the alternative market, private, public, etc. (including informal) modes of governance of agrarian activity (Bachev, 2004; Bachev and Peeters, 2005).

In each particular stage of the evolution of individual countries, communities, eco-systems, sub-sectors of agriculture and type of farms, there is a specific knowledge for the agrarian sustainability (e.g. for the links between human activity and climate change), individual and social value system (preferences for the "desirable state" and "economic value" of natural resources, biodiversity, human health, preservation of traditions, etc.), institutional structure (rights on food security and safety, good labor conditions, clean nature and biodiversity, of vulnerable groups, producers in developing countries, future generations, animal welfare, etc.), and goals of socio-economic development.

Thus, the understanding, content, and assessment of the agrarian and farm sustainability are always specific for a particular historical moment (period) of time and for a particular socio-economic, institutional and natural environment, in which a farm is functioning. For example, many otherwise "sustainable" farms in East Europe were not able to comply with the high EU standards and restrictions for product quality, safety, ecology, animal welfare, etc. and ceased to exist or entered into "unsustainable" grey sector after the accession of countries to the European Union.

Majority of suggested frameworks for sustainability assessment apply an "universal" approach for "faceless" farms, without taking into consideration the specificity of individual holdings (type, resource endowment, specialization, stage of development, etc.) and the environment in which they function (competition, institutional support and restrictions, environmental challenges and risks, etc.). What is more, usually most systems cannot be practically used by the farms and managerial bodies, since they are "difficult to understand, calculate, and monitor in everyday activity" (Hayati et al., 2010).

In this book we suggest a practical and holistic approach for assessing sustainability of farming enterprises in the conditions of implementation of EU CAP in Bulgaria.

First, evolution of the "concept" and the major approaches for assessing sustainability of farming enterprises is discussed, and more adequate definition of farming enterprise's sustainability suggested. Particular emphasis is made on justification of a "new" governance aspect of farm's sustainability and on the approach for its integration in the system of assessment of sustainability of farming enterprises.

After that, a specific for the contemporary conditions of development of Bulgarian agriculture framework for assessing sustainability of farming enterprises is proposed including a system of principles, criteria, indicators, and reference values.

After that a "large scale" approbation of suggested framework is made for evaluating the overall, governance, economic, social and environmental sustainability of farming enterprises of different juridical type, size, production specialization, ecological and administrative locations in Bulgaria.

After that factors and perspectives of sustainable farming in Bulgaria are identified.

The book ends with conclusions and directions for further research in the area and for incorporation of suggested system of assessment in the process of improvement of farming enterprises management and forms of public intervention in the sector.

The author is extremely grateful to all colleagues of different disciplines, institutions and countries, who for more than ten years have been helping him "understand" the big problem of agrarian and farm sustainability and the process of their assessment and governance. We also want to thank numerous managers of farming enterprises of different type for priceless "lessons" on farm sustainability and provided information. We are thankful to the National Agricultural Advisory Service, National Union of Agricultural Cooperatives, National Association of Grain Producers, Association of Decorative Plant Producers, Association for Breeding Bulgarian Milk Sheep and other organizations in Bulgaria for provided assistance. Without contribution of all of them this "long" study would not have ended and this book written.

The monography had been reviewed and approved for publication by the members of the Economics of Agrarian Organizations Department of the Institute of Agricultural Economics in Sofia. The author is grateful to all comments and assessments of the three official reviewers Professor Krasimira Kaneva, Professor Nina Koteva, and Professor Ivan Boevski, and other colleagues in the Department for valuable suggestions to improve the manuscript.

PART 1.

FRAMEWORK FOR UNDERSTANDING AND ASSESSING SUSTAINABILITY OF FARMING ENTERPRISES

CHAPTER ONE

APPROACHES FOR DEFINING AND ASSESSING FARM SUSTAINABILITY

1.1. Sustainability as an alternative ideology and a new strategy

Sustainability movements of farmers and consumers initially emerged in the most developed countries (Switzerland, UK, USA, etc.) as a response to concern of particular individuals and groups about negative impacts of agriculture on non-renewable resources and soil degradation, health and environmental effects of chemicals, inequity, declining food quality, decreasing number of farms, decline in self-sufficiency, unfair income distribution, destruction of rural communities, loss of traditional values, etc. (Edwards et al., 1990).

In that relation the term "sustainable agriculture"[1] is often used as an umbrella term of "new" approaches in comparison to the "conventional" (capital-intensive, large-scale, monoculture, etc.) farming, and includes organic, biological, alternative, ecological, low-input, natural, biodynamical, regenerative, bio-intensive, bio-controlled, ecological, conservative, precision, community supportive, etc. agriculture.

After that in the concept of sustainability more topical "social" issues have been incorporated such as: modes of consumption and quality of life; decentralization; community and rural development; gender, intra ("North-South") and inter-generation equity; preservation of agrarian culture and heritage; improvement of nature; ethical issues like animal welfare, use of Genetically-modified crops, etc. (VanLoon et al., 2005).

For the first time the Rio Earth Summit addressed the global problem of sustainable development and adopted its "universal principles" (UN, 1992). They comprise: rights on healthy and productive life in harmony with nature for every individual; protecting the rights of future generation; integration of environmental, social and economic dimensions at all levels;

[1] Term introduced by Australian scholar Gordon McClymont.

international cooperation and partnerships; new international trade relations; application of precaution approach in respect to environment; polluter liability; environmental impact assessment; recognition of women, youth, and indigenous role and interests; peace protection, etc.

In numerous international forums since 1992 sustainability principles have been specified, amplified and enriched. For instance, the 2015 UN Conference on Climate Change in Paris concluded with an agreement to cut emissions and tackle climate change between most (196) countries of the planet (UN, 2015). Also in 2015 the new UN Sustainable Development Goals for transforming the world until 2030 were formulated and further expended, including a number of new agro-dimensions (UN, 2015).

The emergence of that "new ideology" has been also associated with a considerable shift of the "traditional understanding" of the development as a theory and policy. In addition to the economic growth, the later now includes a broad range of social, ethical, environment conservation, etc. objectives. The modernization of the policies of EU, and diverse international organizations (World Bank, FAO, etc.), and the (national, EU) Programs for Agrarian and Rural Development are confirmation of that. What is more, in official documents the general understanding of sustainability is specified and "translated" into language of practice in the form of laws, regulations, instructions, approaches for assessment, systems of "good practices" for farmers, etc.

Apart from that general (declarative) description of the sustainability, there have also appeared more "operational" definitions for sustainability.

For instance, sustainability of farm is often defined as a "set of strategies" (Mirovitskaya and Ascher, 2001). The managerial approaches that are commonly associated with it are: self-sufficiency through use of on-farm or locally available "internal" resources and know how; reduced use or elimination of soluble or synthetic fertilizers; reduced use or elimination of chemical pesticides and substituting integrated pest-management practices; increased or improved use of crop rotation for diversification, soil fertility and pest control; increase or improved use of manures and other organic materials as soil amendments; increased diversity of crop and animal species, reliance of broader set of local crops and local technologies; maintenance of crop or residue cover on the soil; reduces stocking rates for animals; employment of holistic, life-cycle etc. management of farm and resources; full pricing of agricultural inputs and charges for environmental damages, etc. Accordingly, the level of sustainability of a particular farm is measured through changes in the resources use (e.g. application of chemical fertilizers and pesticides) and

the introduction of alternative (sustainable) production methods, and their comparison with the "typical" (mass distributed) farms.

However, interpreting sustainability as "an approach of farming" is not always useful for adequate assessment of sustainability and for "guiding changes in agriculture".

Firstly, strategies and "sustainable practices", which emerge in response to the problems in some (developed) countries, are not always appropriate for the specific conditions of other countries.

For instance, a major problem in the Bulgarian farms has been insufficient and/or unbalanced compensation with chemical fertilizers of taken with yields Nitrogen, Potassium, and Phosphorus; low rate of farmland utilization and irrigation; widespread application of extensive and primitive technologies (insufficient utilization of chemicals, application of too much manual labor and animal force, gravity irrigation); domination of miniature and extensive livestock holdings, etc. (Bachev, 2010). Apparently, all these problems are quite different from the negative impacts on the natural environment as a result of the over-intensification of farms in the old states of the EU and other developed countries.

Moreover, the priorities and hierarchy of the goals in a particular country also change in time, which makes that approach unsuitable for comparing sustainability of farms in different subsectors, countries and in dynamic (in time).

For instance, in EU until 1990s the food security and maximization of output was a main priority, which was replaced after that by the food quality, diversity and safety; conservation and improvement of natural environment and biodiversity; protection of farmers' income; market orientation and diversification; care for animal welfare; preservation and revitalization of rural communities, etc. There has been also going a discussion about a fundamental change in the EU CAP for the next programing period starting from 2021.

Secondly, such understanding of farm sustainability may lead to rejection of some approaches associated with modern farming but nevertheless enhancing sustainability. For example, it is well-known that biodiversity and soil fertility are preserved and improved through efficient tillage rather than "zero tillage" and bad stewardship to farmland. Application of the latter approaches in the past led to enormous challenges and even to loosing of the "agrarian" character of many agro-ecosystems in Bulgaria and other countries alike (Bachev, 2010, 2014). At the same time, there are many examples for "sustainable intensification" of agriculture in many countries around the world (Garnett and Godfray, 2012).

Third, such understanding of farm sustainability makes it impossible to evaluate the contribution of a particular strategy to sustainability since that the specific approach is already used as a "criterion" for defining sustainability.

Forth, because of the limited knowledge and information during the implementation of a strategy it is likely to make errors ignoring some that enhance sustainability or promoting others that threaten (long-term) sustainability. For examples, the problems associated with the passion on "zero and minimum" tillage in in the past in Bulgaria are well-known. Similarly, many experts do not expect a "huge effect" on environmental sustainability from the "greening" of the EU CAP during the current programing period (Hendricks, 2010).

Fifth, a major shortcoming of that approach is that it totally ignores the economic dimensions (absolute and comparative efficiency of resources utilization), which are critical for determining the level of farm sustainability. It is obvious that even the most "ecologically clean" farm in the world would not be sustainable "for a long time" if it does not sustain itself economically (Bachev, 2005).

Last but not least important, such an approach does not take into account the impact of other critical (external for the farm) factors, which eventually determine the farm sustainability, namely the institutional environment (existing public standards and restrictions), evolution of markets (level of demand for organic products of farms), macroeconomic conditions (opening up of high paid jobs in other industries), etc.

It is well known that the level of sustainability of a particular farming enterprise is quite unlike depending on the specific socio-economic and natural environment in which it functions and evolves. For instance, introduction of the support instruments of the EU CAP in Bulgaria (direct payments, export subsidies, Measures of the National Programme for Agrarian and Rural Development (NPARD) increased further sustainability level of large farms and cereal producers, and diminished it considerably for the small-scale holdings, livestock farms, and vegetable and fruits producers (Bachev et al., 2014).

Furthermore, some negative processes associated with the agrarian sustainability in regional and global scale, could impact "positively" the sustainability of some farms in a particular region or country. Example, focusing on harmful emissions of a particular farm does not make a lot of sense in the conditions of a high overall (industrial) pollution in the region (contrary, it will be a greater public tolerance toward farms polluting the environment); global worming increases productivity of certain farms in Bulgaria and other Northern countries since it improves cultivation

conditions, reduces the risk of frost, allows product diversification, etc. (Bachev, 2013).

1.2. Sustainability as a system characteristic

Another approach characterizes sustainability of agricultural system as "ability to satisfy a diverse set of goals through time" (Brklacich et al., 1991; Hansen, 1996; Raman, 2006).

The goals generally include: provision of adequate food (food security), economic viability, maintenance or enhancement of natural environment, some level of social welfare, etc. Numerous frameworks for sustainability assessment of farms are suggested which include ecological, economic and social aspects (Fuentes, 2004; Lopez-Ridaura et al., 2002; Candido et al., 2015; Sauvenier et al., 2005). According to the objectives of the analysis and the possibilities for evaluation, divers and numerous indicators are used for employed resources, activities, impacts, etc.

However, usually there is a "conflict" between different qualitative goals – e.g. between increasing the yields and income from one side, and amelioration of the labor conditions (working hours, quality, safety, remuneration) and the negative impact on environment from the other side.

Therefore, there is a standing question: which element of the system is to be sustainable as preference is to be given on one (some) of them on the expense of others[2].

Besides, frequently it is too difficult (expensive or practically impossible) to determine the relation between the farm's activity and the expected effects – e.g. the contribution of a particular (group of) farms to the climate change.

For resolution of the problem of "measurement" different approaches for the "integration" of indicators in "numeric", "energy", "ecological", "monetary", etc. units are suggested. Nevertheless, all these "convenient" approaches are based on many (often scientifically unproven) assumptions associated with the transition of indicators in a single dimension, determining the relative "weight" of different goals, etc.

Not rarely, the integration of indicators is based on wrong assumptions that the diverse goals are entirely interchangeable and comparable. For instance, the "negative effects form the farming activities" (environmental

[2] By definition agricultural production means destruction of natural "sustainability" of natural ecosystems, in particular interference and demolishing of natural biodiversity.

pollution, negative effects on human health and welfare, etc.) are evaluated in Euros and Dollars, and they are sum up with the "positive effects" (different useful farm products and services) to get the "total effect" of the farm, subsector, etc. Apparently, there is not a social consensus on such "trade-offs" between the amounts of farm products and destroyed biodiversity, the number of sick or dead persons, etc.

Also it is wrongly interpreted that sustainability of a system is always an algebraic sum of the sustainability levels of its individual components. In fact, often the overall level of sustainability of a particular system - the farm, is (pre)determined by the level of sustainability of the (critical) element with the lowest sustainability – e.g. if a farm is financially unsustainable it breaks down.

Besides, it is wrongly presumed that farm sustainability is an absolute state and can only increase or decrease. Actually, "discrete" state of non-sustainability (e.g. failure, closure, outside take over, etc.) is not only feasible, but a common situation in farming around the globe (Bachev and Peeters, 2005).

Another weakness of the described approach is that "subjectivity" of the specification of goals links criteria for sustainability not with the farm itself but with the value of pre-set goals depending on the interests of the farmer and/or stakeholders, the priorities of the development agencies, the standards of the analysts, the understanding of the scientist, etc.). In fact, there is a great variety of (types of) farming enterprises as well as preferences of the farmers and farm-owners – e.g. "own supply" with farm products and services; increasing the income or profit of farm households, preservation of the farm and resources for future generations, servicing communities, maximization of benefits and minimization of costs for final consumers, etc.

Besides, at lower levels of the analysis of sustainability (parcel, division, farm, and eco-system) most of the system objectives are exogenous and belong to a larger system(s). For example, satisfying the market demands less depends on product of a particular (group of) farm(s); many ecological problems appear on regional, eco-system, national, transnational or even global scale, etc.

Actually, the individual type of farms and agrarian organizations have their own "private" goals – profit, income, servicing members, subsistence, lobbying, group or public (scientific, educational, demonstration, ecological, ethical, etc.) benefits. These proper goals rarely coincide (and often are in conflict) with the goals of other systems (including, the agrarian system as a whole). At the same time, the extent of achieving all these specific goals is a precondition (incentive, factor) for

the sustainability of the diverse type of organizations of agrarian agents (Bachev, 2004, 2013).

Furthermore, different type of farming enterprises (individual, family, cooperative, corporative) have quite unlike internal structure as goals of individual participants not always coincide with the goals of the entire farm. While in the individual and family farm there is a "full" harmony (the owner-farmer), in more complex farming enterprises (partnership, cooperative, corporation) often there is a conflict between the individual and the collective goals ("division of ownership from farming and/or management"). For instance, in Bulgaria and around the globe there are many highly sustainable organizations with a changeable membership of the individual agents (partners, cooperative members, shareholders, etc.).

Therefore, the following question is to be answered: sustainability for whom in the complex social (economic) system – the entrepreneurs and the managers of the farming enterprise, the working owners of the farm, the farm households, the outside shareholders, the hired labor, the interest groups, the local communities, the society as a whole, international community, etc.

Last but not least important, many of described approaches for understanding and assessing sustainability do not include the essential "time" aspect. However, as Hansen rightly pointed it out: "if the idea for continuation in time is missing, then these goals are something different from sustainability" (Hansen, 1996).

The assessment of sustainability of the farming enterprise has to give idea about future, rather than to identify past and present states (the achievement of specific goals in a particular moment of time). The worldwide experience demonstrates that due to the bad management, inefficiency or market orientation of the cooperative and public farms, many of their members leave, fail or set up more efficient (and sustainable) private structures (Bachev, 2010). Simultaneously, many farms with low sustainability in the past are with an increasing socio-economic and ecological sustainability during current EU CAP implementation as a result of the changes in the ownership, strategy, state policy and support, liberalization and globalization of economies, etc.

Another approach interprets sustainability as "ability (potential) of the system to maintain or improve its functions" (Candido et al., 2015; Hansen, 1996; Lopez-Ridaura et al., 2002; Mirovitskaya and Ascher, 2001; VanLoon et al., 2005).

According to that approach, initially main system attributes that influence sustainability are specified such as: stability, resilience; survivability; productivity; quality of soil, water, and air; energy

efficiency; wildlife habitat; self-sufficiency; quality of life; social justice, social acceptance, etc. After that, indicators for the measurement of these attributes are identified and their time trends evaluated usually for 5-10 and more years. For instance, most often for the productivity indicators are used yield, product quality, profit, income, etc. In the Agricultural Economics they are also widespread models for the "integral productivity" of the factors of production (land, labor, capital, innovation), which are used in sustainability analysis as well.

The biggest advantage of such as approach is that it links sustainability with the system itself and with its ability to function in future. It also gives an operational criterion for sustainability, which provides a basis for identifying constraints and evaluating various ways for improvement. Besides, it is not complicated to quantitatively measure the indicators, their presentation as an index in time, and appropriate interpretation of sustainability level as decreasing, increasing, or unchanged. Since trends represent an aggregate response to several determinant that eliminate the needs to devise complex (and less efficient) aggregation schemes for sustainability indicators.

Above suggested methods however, have significant shortcomings, which are firstly related with the wrong assumption that the future state of the system can be approximated by the past trends. What is more, for newly established structures and farms without a (long) history it is impossible to apply that approach for assessing sustainability. However, in most East European countries and in some other regions (Former USSR, China, Vietnam, etc.), namely such structures dominate in farming which emerged in the last 10-20 and more years.

Furthermore, the "negative" changes in certain indicators (yield, income, water and air quality, biodiversity, etc.) could be result of the "normal" processes of operation of the farm and larger systems, part of which the evaluated farm is (e.g. the fluctuation of market prices, the natural cycles of climate, the overall pollution as a result of industrial development, etc.) without being related with the evolution of sustainability of evaluated farm. For instance, despite the environmentally friendly behavior of a particular farm, the ecological state of the farm could be worsening, if the needed "collective eco-actions" by all farms in the region are not undertaken (Bachev, 2010).

In order to avoid above mentioned disadvantages, it is suggested to compare the farm indicators not in time, but with the average levels of farms in the sub-sector, region, etc.

However, the positive deviation from the averages not always gives a good indication for the sustainability of farms. There are many cases when

all structures in a particular (sub) sectors and regions are unsustainable (dying sectors, uncompetitive productions, "polluting" environment subsectors, deserted regions, financial and economic crisis, etc.).

Also there are examples for entire agro-ecosystems, of which the individual "sustainable" farms are a part, they are with a diminishing sustainability or unsustainable as a result of the negative externalities (on waters, soils, air) caused by farms in other regions and/or sectors of the economy, the competition for resources with other industries or uses (tourism, transport, residence construction, natural parks, etc.).

In addition, an essential problem of such an approach is that it is frequently impossible to find a single measure for each attribute. The latter necessitates some subjective "commensuratement" and prioritizing of the multiple indicators, which is associated with already described difficulties of other approaches for sustainability assessment.

That approach also ignores the institutional and macroeconomic dimensions, the unequal goals of different type of farms and organizations, and the comparative advantages and the complementarity of the alternative governing structures (Bachev, 2004, 2010). Namely these factors are crucial when we talk about the (assessment of) sustainability of micro-economic structures like individual and family farms, agro-firms, and agro-cooperatives.

1.3. Farm as governance structure

In a long-term there exists no economic organization if it is inefficient since otherwise it would be replaced by more efficient organization (Bachev, 2004). Therefore, the problem of assessment of sustainability of farming enterprises is directly related to estimation of factors and level of farm efficiency (Bachev and Petters, 2005).

In the Traditional Economics, the farm is presented as a "production structure" and analyses of efficiency are restricted to the production costs ("optimization of technological factors according to marginal rule"). However, this approach fails to explain a high sustainability of individual type of farms (subsistence, semi-market, cooperative, small commercial, large agri-firms) with a great variation in "efficiency levels" in Bulgaria as well as around the globe (Bachev, 2004, 2010).

In addition to production costs, modern farming is also associated with significant transaction costs (Bachev, 2004). For instance, there are enormous costs for finding the best partners and prices, for negotiating conditions of exchange and for "contract writing", for enforcing and disputing agreements, for protecting property rights, etc.

As a rule "rational" agrarian agents tend to seek, chose and/or develop the most effective mode for organization (governance) of their relations that minimize their bounded rationality, and safeguard their investments and (absolute and contracted) rights from hazard of opportunism[3]. Consequently, in the long run, only effective governing structures that maximize benefits and minimize costs of transacting will tend to dominate (sustain) in agriculture (Bachev, 2004).

When transaction costs are high, they could block otherwise effective transactions, and restrict farm size far below the technologically optimal level. Very often the high costs for market trading (e.g. for finding credit; marketing of output) and/or internal governance (deficiency of low transacting cost labor) limit the farming enterprise size to miniature subsistent farming or family borders. In other instances, existing effective potential to economize on market transacting costs causes a vast extension of farming enterprise size through backward, lateral or forward integration of activity.

For example, high costs for market and contract trading in the conditions of great economic and institutional uncertainty during post 1989 transition in Bulgarian (and most East European countries) has turned the subsistent farming into the most effective (or only possible) forms for organization of available agrarian assets (farmland, livestock, labor, etc.) of more than a million Bulgarians (Bachev and Tsuji, 2001). On the other hand, enormous costs of market and standard contract trading have caused domination of integrated and interlinked modes, and concentration of commercial farming in few thousands large firms and cooperative farms.

Thus in the world of positive transaction costs, farms and other agrarian organizations have "another" significant economic role. They are not only production but also major governing structures – forms for organization and governing transactions, for maximization of transacting benefits and minimization of transaction costs. Therefore, sustainability of individual type of farming enterprises cannot be correctly understood and estimated without analyzing their comparative production *and* governance potential

[3] Transacting costs have "behavioral origins" such as bounded rationality and tendency for opportunism of economic agents (Williamson, 1996).

1.4. "Institutional aspect" of sustainability

Institutional framework is a critical factor for farm and agrarian sustainability (Bachev, 2004; Bachev and Peeters, 2005). The level of sustainability of a particular farming enterprise is quite different depending on the existence of public support programs; social mechanisms for protection from natural disasters and market failures; strict standards for product quality, working conditions, animal welfare, and environmental protection; unlike permitted legal modes for market and private transacting; (in) efficiency of the system of laws and private contract enforcement; diverse tradition, etc.

For instance, a strong dependency from public subsidies often is estimated to be an indicator for a low sustainability for certain type of farming enterprises. At the same time, the experiences of most developed countries with a long-term subsidization for agriculture (EU, Switzerland, USA, Japan) indicates that namely a high public support is important factors for strong sustainability of certain (family, smallholders, community, independent, etc.) farming structures.

"Operational" goals of sustainable development and mechanisms of their achievements are also institutionally determined. For instance, (socially) acceptable formal and informal norms for use of labor (employment of children, safety standards, minimum wages, social assurance), plant and livestock (animal welfare, preservation of biodiversity, usage of Genetically-modified crops), and environmental resources (water use rights; permissions for pollution of air, water, and soils), all they could differ even between various regions of the same country[4]. In Bulgarian for instance, like in many other countries, there are unlike levels of compliance and enforcement of standards for food in market and subsistence holdings; unlike level of social tolerance to (domestic) livestock farms in different residential locations; significant differentiation in implementation of environmental standards in different regions and communities, etc.

The level of individual and overall transaction costs is also greatly determined by the institutional environment. Principally, if state of Law, trust, good will, and stability dominate in a society, then costs for protection and exchange of private rights would be insignificant (Bachev, 2004). Alternatively, if private rights were not well defined, enforced, or

[4] In Valonia for instance, environmental standards are much more restrictive than in other two regions (Flandria and Brussels) of small Belgium.