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Mechanisms of Governance of Sustainable Development

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ABSTRACT

In this paper we incorporate the interdisciplinary New Institutional and Transaction Costs Economics (combining Economics, Organization, Law, Sociology, Behavioral and Political Sciences), and suggest a framework for analyzing the mechanisms of governance of sustainable development. The agricultural sector is used to illustrate the approach, test the framework, and support with examples.

Firstly, we discuss the modern concepts and the economics of sustainability.

Secondly, we present a new framework for analysis and improvement of the governance of sustainable development. This new approach takes into account the role of specific institutional environment; and the behavioral characteristics of individual agents; and the transaction costs associated with the various forms of governance; and the critical factors of economic activity and exchanges; and the comparative efficiency of market, private, public and hybrid modes; and the potential of production structures for adaptation; and the comparative efficiency of alternative modes for public intervention.

Finally, we identify specific modes for environmental governance in Bulgarian agriculture; and assess the efficiency of market, private and public modes; and estimate the prospects for evolution of environmental governance in the conditions of EU CAP implementation. Agrarian development is associated with specific (different from other European states) environmental challenges such as degradation and contamination of farmland, pollution of surface and ground waters, loss of biodiversity, significant greenhouse gas emissions etc. That is a result of the specific institutional and governing structure evolving in the sector during the past 20 years. Implementation of the common EU policies will have unlike results in “Bulgarian” conditions enlarging income, technological, social and environmental discrepancy between different farms, sub-sectors and regions. Dominating subsistence farming, production cooperatives, small-scale commercial farms, and large business firms will be highly sustainable in years to come.

Key words: mechanisms of governance; sustainable development; institutions, market, private, public and hybrid modes of governance; transaction costs; agrarian sustainability; environmental governance; Bulgaria

INTRODUCTION

The governance of sustainable development is among the most topical issues in academic, business, and policies debates in developed, transitional, and developing countries [EC; OECD; Raman; UN; VanLoon *et al.*]. It is widely recognized that achievement of economic, social, environmental, intra and inter-generational goals of sustainable development requires an effective social order (governance) and coordinated actions at various levels (individual, organizational, community, regional, national, transnational). The governing mechanisms that

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could be effectively used include a mixture of „invisible hand of market” (market order), individual initiatives and contracts (private order), „visible hand of the manager” (fiat), collective decision-making (collective order), government intervention (public order), multinational actions (international order), and hybrid modes.

It is also known that the effective forms of governance of sustainable development are rarely universal and there is a big variation among different countries, regions, subsectors etc. Experience shows that different societies achieve to a different extend the economic, social, environmental etc. goals of sustainable development. That is a result of the specific governing structures which affect in dissimilar ways individuals behavior, give unlike benefits, command different costs, and lead to diverse actual performances. Despite that institutional aspects are largely ignored and a “normative” approach dominates while the costs of governance are not included into analyses. Consequently, the potential of market and private governing modes for the specific economic, institutional and natural environment in each country, region, and sub-sector can not be properly assessed. Nor the effective modes for public (government, UN, EU, international assistance etc.) interventions designed.

Research on mechanisms of governance of sustainability is at the beginning stage due to the “newness” of the problem, and the emerging new challenges for the governance, and the fundamental modernization during the last two decades, and the “lack” of long-term experiences and relevant data. Most studies are focused on the governance of an individual (economic or social or environmental) aspect of sustainability, or on formal modes and mechanisms. What is more, they are typically restricted to a certain form (contract, cooperative, an industry initiative, a public program), or a management level (firm, eco-system), or a particular location (region). Besides, uni-sectoral analyses are broadly used separating the governance of production from the governance of overall households and rural activities. Moreover, “normative” (to some ideal or external model) rather than comparative institutional approach between feasible alternatives is employed. Likewise, the significant social costs associated with the governance (known as transaction costs) are not taken into consideration. Furthermore, uni-disciplinary approach dominates, and efforts of researchers in Economics, Organization, Law, Sociology, Ecology, Technology, Behavioral and Political Sciences are rarely united to deal with that complex matter. And lastly, there are little studies on specific institutional, economic, cultural, natural etc. factors responsible for the big variation among countries, regions, industries, and organizations.

Consequently, our understanding on the institutional, behavioral, technological, ecological, international etc. factors of the governance of sustainable development is impeded. Neither the spectrum of feasible formal, informal, market, private, public, integral, multilateral, transnational etc. modes of governance can be properly identified. Nor their efficiency (potential, limits), complementarities, and prospects of development correctly assessed. All these restrict our capability to assist improvement of public policies and modes of intervention, and to support individual and collective actions for sustainable development.

In this paper we incorporate the interdisciplinary New Institutional and Transaction Costs Economics (combining Economics, Organization, Law, Sociology, Behavioral and Political Sciences) [Coase; Furuboth and Richter; North; Williamson], and suggest a framework for analysis of mechanisms of governance of sustainable development. The agricultural sector is used to illustrate the approach, test the framework, and support with examples.

Firstly, we discuss the modern concepts and the economics of sustainable development. *Secondly*, we present a new framework for analysis and improvement of the governance of sustainable development. This new approach takes into account the role of specific institutional environment; and the behavioral characteristics of individual agents; and the transaction costs associated with the various forms of governance; and the critical factors of economic activity and exchanges; and the comparative efficiency of market, private, public and hybrid modes; and the potential of production structures for adaptation; and the comparative efficiency of alternative

modes for public intervention. *Finally*, we identify specific modes for environmental governance in Bulgarian agriculture; and assess the efficiency of market, private and public modes; and estimate the prospects for evolution of environmental governance and farms sustainability in the conditions of EU CAP implementation.

MODERN UNDERSTANDING OF SUSTAINABILITY

Ideology, strategy, or system characteristic

Sustainability movements evolved in developed countries as a response to concerns about the impacts of agriculture on the depletion of non-renewable resources, soil degradation, health and environmental effects of chemicals, inequity, declining rural communities, loss of traditional values, food quality, workers safety, decline in self-sufficiency, decreasing number of farms etc. [Edwards *et al.*]. Very often the “sustainable” agriculture is used as an umbrella term of “new” approaches to the “conventional” (capital-intensive, large-scale, monoculture etc.) agriculture, and includes the organic, biological, alternative, ecological, low-input, biodynamical, regenerative etc. agriculture. More recently the “social” issues 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 GM crop) etc. all they have been incorporated into the sustainability concept [VanLoon *et al.*].

The 1992 Rio Earth Summit addressed the *global problem of sustainable development* and adopted the Declaration of its “universal principles” [UN]. 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; 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. The emergence of that “*new ideology*” has been associated with a considerable shift of the “traditional paradigm” of development.

Apart from that general description, there have also appeared more “*operational definitions*” for sustainability. For instance, sustainability is often defined as “*set of strategies*”. Management approaches that are commonly associated with the agrarian sustainability 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; full pricing of agricultural inputs and charges for environmental damages etc. [Mirovitskaya and Ascher].

However, interpreting the sustainability as “an approach” is not always useful for “guiding change in agriculture”. *Firstly*, the fact that some forms of agriculture are more enabling factor to ecological, social or economic sustainability (than others) does not mean that sustainability is inherent to any particular set of practices, technologies, farming systems or policies. *Secondly*, strategies, which emerge in response to the problems in developed countries, may be inappropriate in the regions where circumstances and problems are quite different (e.g. underdeveloped, developing or transitional countries). *Third*, it may lead to rejection of some approaches associated with the conventional agriculture but nevertheless enhancing

sustainability. *Next*, it makes impossible to evaluate the contribution of a strategy to sustainability since that particular approach has already been used as a “criterion” for defining the sustainability. *Finally*, because of the limited knowledge during implementation of a strategy it is likely to make errors ignoring some that enhance sustainability or promoting others that threaten (long-term) sustainability.

Another concept characterizes sustainability of agricultural system as “*ability to satisfy a diverse set of goals through time*” [Hansen; Raman]. The goals generally include provision of adequate food (food security), economic viability, maintenance or enhancement of natural environment, some level of social welfare etc. However, usually there is “conflicts” between different qualitative goals and that creates problems of assessment (needs for integration, ranking, trade-offs). Besides, “subjectivity” of the specification of goals links the criteria for sustainability with the value of pre-set goals (e.g. the interests of stakeholders, the priorities of development agencies, the standards of analysts etc.) rather than to the agricultural system itself. At last, at the low levels of analysis (parcel, farm, sector, region) most of the objectives are exogenous and belong to a larger system.

A number of authors interprets sustainability as an “*ability (potential) of the system to maintain or improve its functions*” [Hansen; Mirovitskaya and Ascher; VanLoon *et al.*]. Accordingly, the main system attributes that influence sustainability are specified as: resilience; survivability; profitability; productivity; quality of soil, water, and air; energy efficiency; wildlife habitat; quality of life; and social acceptance etc. Indicators for the measurement of all these attributes are identified and their time trends evaluated. Since trends represent an aggregate response to several determinant that eliminate the needs to devise aggregation schemes. Usefulness of that definition comes for suggesting operational criteria for sustainability, providing a basis for identifying constraints and evaluating various approaches to improvement of agrarian sustainability. The most common critics are that it is impossible to find a single measure for different attributes; the assumption that future state of the system can not be approximated by the past trends; and the ignorance of the needs and the goals of human actors within the system.

Having in mind the constantly evolving feature of the sustainability concept and the dynamism of the agricultural system itself, the sustainability is increasingly perceived as a “*process of learning about changes and adapting to these changes*” [Raman]. According to that new understanding the agricultural sustainability is always *specific to a time, situation, and component*, and refers to the capability of agricultural systems to evolve and endure by adapting to and accommodating changes over time and in space. Furthermore, that inbuilt dynamism of the systems also includes a feasible “finite life” (no system is sustainable forever) as agricultural system is considered sustainable if it attains its expected life span.

We believe that sustainability has to be a *criterion* for guiding changes in policies, farming and consumption practice, agents behavior, focusing of research and development priorities etc. Therefore, definition of sustainability has to be based on the “*literal*” meaning of the sustainability – thus perceived as a *system characteristics* and “*ability to continue (maintain) over time*”. Besides, the characterization has to be “*system-oriented*” while system is to be clearly specified, including its time and spatial boundaries, components, goals, and context in the hierarchy. What is more, it is to include taking into account the *adaptation potential* of the major system’s elements to the evolving natural and social environment. Moreover, our approach has to allow a *comparative analysis* of the different agricultural systems². The characterization of

² Certain authors wrongly associate the comparability with a “continues (quantitative) rather than discrete property” of a system [Hansen]. In fact, there is no reason to believe that sustainability of an agricultural

sustainability must be *predictive* since it deals with future changes rather than past and present. And finally, it should be diagnostic, and to *focus intervention* by identifying and prioritizing constraints, testing hypothesis, and permitting assessments in a comprehensive way.

Economics of sustainability

The problem of sustainability has been always an important part of the economic theory. Most often it is discussed in relation to (in)efficiency of using common natural resources (“tragedy of commons”) [Hardin], and to “negative externalities” associated with some activities [Pigou]. In recent years, it is increasingly associated with the multi-functionality (joint production character) of agriculture [OECD, 2001].

When common ownership and “open access” to natural resources exists, there is tendency for inefficient use (“overuse”) of resources. For example, there are certain natural limits for “sustainable” exploration of a meadow for livestock farming or a pond for fishing or irrigation. The long-term efficiency (output) would decrease if number of the grazing animals or catching fish increase beyond these norms of an effective natural reproduction. In a one-person farm or private ownership, there will be no conflict between the efficiency and sustainability (maximization of the output over time). However, in a situation of *multiple users* and *open access*, there are strong individual interests for overusing the common resources since the private costs are not proportionate to the private benefits. In that case, individuals get full output from increasing the number of animals (or fish catch) while bear a small portion of the overall decrease in the total yield as a result of over-exploitation. Consequently, a constant overuse (non-sustainability) and a low long-term efficiency come out as a result of this form of organization of natural resources. In the modern (globalize) world a great number of the natural and environmental resources have been increasingly affected by the “tragedy of commons”, and the water crisis, biodiversity crisis, global warning etc. are top on the agenda.

Nonetheless, the “*tragedy of commons*” could be avoided by an alternative institutional arrangement. For instance, an introduction of a public regulation on the exploitation of natural resources, such as distribution (and enforcement) of quotas for farmers and fishermen, would keep sustainability. In other instances, the privatization of natural resources would be an effective solution since it would create strong private incentives for the long-term preservation of resources. In the later case, a private agent (the owner) will contract and control an effective and sustainable use of the limited natural resources.

Another classical case of “market failure” for the allocation and sustainable use of natural resource is caused by the *negative externalities* of certain activities. The free-market prices do not always reflect the effect on third party’s welfare, and that is why they cannot govern effectively the resource allocation and uses. For instance, the price of livestock products does not comprise the costs of the pollution of underground water by the farm activity. Since private agents (farmers, consumers of farm products) do not pay the full price and the costs associated with their activity, they are not interested in the most effective (and sustainable) use of natural resources. Maximization of the social output and welfare cannot be achieved, and an inefficient allocation and overuse of resources, and unsustainable development come out as a result. Thus efficiency and sustainability of some elements of the system (e.g. farms) are in conflict with the efficiency and sustainability of the other elements of the system (e.g. consumers) or the system as a whole.

system could only increase or decrease. Discrete features (“sustainable”-“non-sustainable”) are possible, and of importance for the farm managers, interests groups, and policy makers [Bachev and Peeters].

Therefore, an elimination of the *differences* between the “social” and “private” prices (“internalization of externalities”) through taxes, norms etc. is commonly suggested. Besides, various monetary and nonmonetary³ methods for the “evaluation of environmental resources and costs” are developed and used in the analysis of overall efficiency. At the same time, the effectiveness of suggested methods is questioned because the role and services of the natural resources are not always known, and the entire “social” (present and future) value could be rarely properly evaluated. Besides, monetary assessments and dollars calculations of the most part of negative externalities (the adverse “impact” on human health; the “value” of lost biodiversity; the “exhausting” of non-renewable resources, etc.) do not often make sense since they are not socially acceptable (no “trade-off” is possible).

Coase has proved that the *problem of “social costs”* does not exist in a world of zero transaction costs and well-defined private rights [Coase]. The situation of maximum efficiency is always achieved independent of the initial allocation of rights. If for instance, a farmer has the “right to pollute”, the affected agents would pay him an appropriate “bribe” (equal to the lost income or welfare) to stop polluting activity. If the opposite is true and the farmer does not have the “right to pollute”, then farmer would pay the appropriate bribe to other agents to let him certain pollution. In either case, the welfare of all agents is maximized and the maximum efficiency (known as Pareto optimum) reached without a need for any public intervention. However, when *transaction costs* are significant, then costless negotiation and exchange of rights is not possible. Therefore, the initial allocation of the property rights between individuals is critical for the overall efficiency and sustainability. Consequently, the *institutional structures* for carrying out the agrarian activities become an important factor, which eventually determine the outcome of the system (the efficiency) and the type of the development (sustainability) [Bachev, 2007].

“*Jointness of production*” is a fundamental characteristic of the farming. The classical example is when a market-oriented farm produces “multiple products” such corn and hogs, and feed corn to the hogs. That is caused by the opportunities for more productive use of resources (economy of scale and scope) or as a risk reduction strategy (diversification, integration of critical transactions) of the farm manager. In modern farming there are also outputs, which are less desired – e.g. wastes. And finally, the farming output consists of both “private” and “public goods” such as food, rural amenities (hunting, landscape etc), ecological and cultural services, habitat for wildlife, biodiversity etc. A great part of the farm’s “non-commodity” outputs is “not-separable” from the major farming activities. Moreover, for these (public, quasi public) goods no markets exist or markets function very poorly. Since these outputs are not “tradable” (profitable) the farmers have no incentives to produce them in a socially demanded scale. For the effective execution of such “public” functions of farms and for the production of the appropriate amount of the positive *and* negative externalities by the agriculture it is necessary to develop and apply other (*non-market*) *modes for governance* [Bachev, 2007].

The principal role of the governance for the character and the pace of development is recognized and intensively studied [North; Furuboth and Richter; Williamson]. The specific *institutional environment* in which activity takes place eventually determines the level of economic performance and the sustainability in different industries, regions, countries or periods of history. The factors for the emergence and evolution of various types of institutions are quite specific for each society, and require a multidisciplinary analysis and explanation [Norht]. In the long-run, the institutions are *endogenous* parameters of the system and the *institutional “development”* is to be included in the model along with the economic, social and environmental components. On the other hand, in the specific institutional environment the “sustainability” of

³ E.g. eco, carbon, energy, water etc. footprints.

various market, private, collective etc. modes of governance will depend on the comparative efficiency of the alternative governing arrangements [Bachev, 2007]. However, a high efficiency and sustainability of the different governing forms (farms, business organizations, collective actions etc.) does not always mean a high efficiency and sustainability of the development. As North and Williamson have proved it the history of institutional development is full of examples of “failures” while the organization modernization is usually a success story [North; Williamson].

Today “multi-functionality” of agriculture is socially recognized, and the sustainability is considered both as a *criteria* and a *goal (outcome) of the development*. It is also recognized that sustainability cannot be effectively achieved as a “side result” of totally decentralized actions (free market competition, contracting, collective initiatives). The sustainable development requires *effective governing* and *enforcement mechanisms* including a significant *public* involvement in market and private activities at local, national, transnational and global levels. Therefore, the analysis of the *governance mechanisms* for agrarian sustainability becomes essential both for defining the efficiency (potential and limits) of market competition and private sector initiatives as well as for designing the most effective modes for public (Government, international etc.) interventions in agrarian sector [Bachev, 2007].

MECHANISMS OF GOVERNANCE

Institutions matter

Institutions are the “rules of the game”, and they determine the individuals’ rights in society and the way the property rights⁴ are enforced [Furuboth and Richter; North]. The spectrum of rights could embrace the material assets, natural resources, intangibles, certain activities, labor safety, clean environment, food security, intra- and inter-generational justice etc. A part of the property rights are constituted by the *formal* laws, regulations, standards, court decisions etc. In addition, there are important *informal* rules determined by the tradition, culture, religion, ideology, ethical and moral norms etc. The *enforcement* of various rights is done by the state (administration, court, police) or other mechanisms such as community pressure, trust, reputation, private modes, self-enforcement etc.

The institutional analysis is not interested in de-jure rights but *de-facto* rights individuals and groups possess. For instance, the “universal principles” of sustainable development have been declared (1992 Rio Earth Summit) and accepted by most countries. However, the extend of adaptation and respecting of related rights, and their practical enforcement vary significantly among countries.

The *specific* institutional environment affects human behavior and directs (*governs*) individuals’ activities “in a predictable way” [North]. It creates dissimilar *incentives* and *restrictions* for intensifying exchange, increasing productivity, inducing private and collective initiatives, developing new rights, decreasing divergence between social groups and regions, responding to ecological and other challenges. For example, (socially) acceptable norms for use of labor (employment of children, safety standards, minimum wages), plant and livestock (animal welfare, preservation of biodiversity, usage of GM crops), and environmental resources (water use rights; permissions for pollution), all they could differ even between various regions of the same country⁵. Namely the specific institutional structure eventually determines the

⁴ While lawyers distinguish between property and human rights, for the economists *all rights are property rights* [Furuboth and Richter].

⁵ In Valonia for instance, the environmental standards are much more restrictive than in other two Belgium regions - Flandria and Brussels [Sauvenier *at al.*].

potential for and the particular *type of* development in different communities, regions, and countries.

The *institutional “development”* is initiated by the public authority, international actions (agreements, assistance, pressure), and the private and collective actions of individuals. It is associated with the modernization and/or redistribution of the existing rights; and the evolution of new rights and the emergence of novel (private, public, hybrid) institutions for their enforcement. For instance, the sustainability initially evolved as “movements” and a “new ideology” in developed countries. Afterward this “new concept” extended and instituted in the body of formal laws, regulations and public support programs. Numerous initiatives of producers and consumers have been wide-spreading in recent years (e.g. codes of ethical behavior, organic farming, system of fair-trade etc.) being an important part of (pushing up) the institutional modernization in the area.

The diverse *institutional environment* contributes to a different extent to achieving economic, social, environmental etc. goals of the sustainable development. If for instance, the private rights are not well defined, enforced, or are restricted, that would limit the intensification of exchange and the overall economic development. Indeed the rights on major agrarian resources were not well defined during the post-communist transition in Bulgaria and that led to the domination of low productive, unsustainable and “gray” structures; and ineffective use of large national resources; and serious economic, social and environmental problems in rural areas [Bachev, 2006]. The classical examples for the importance of institutional structure are associated with the “tragedy of commons” and the negative externalities.

Thus the “*institutions matter*” and the analysis of sustainability is to be done in the *specific institutional* rather than in an unrealistic (“normative”, desirable) *context*. The weakness of the later approach has been strongly criticized: “The view that now pervades much public policy economics implicitly presents the relevant choice as between an ideal norm and an existing “imperfect” institutional arrangement. This nirvana approach differs considerably from comparative institution approach in which the relevant choice is between alternative real institutional arrangements. In practice, those who adopt the nirvana viewpoint seek to discover discrepancies between the ideal and the real, and if discrepancies are found, they deduce that the real is inefficient. Users of the comparative institution approach attempt to assess which alternative real institutional arrangement seems best able to cope with the economic problem” [Demsetz].

Nevertheless, the institutional aspect is commonly missing in most of the suggested frameworks for analyzing and assessing agrarian sustainability. Accordingly, non-feasible norms rather than the real-life arrangements are used as criteria – e.g. the farming model in other (developed) countries, the assumption for perfectly defined and enforced property rights, the effectively working public (local, state, inter-governmental) organizations etc. Therefore, an analysis of the *structure* and the *evolution* of the real or other feasible institutional arrangements for carrying out the agrarian activities have to be included in the model [Bachev, 2004].

Modes of governance

The New Institutional Economics gives a new insight on the efficiency of diverse market, private, public and mix modes of governance, and their potential to deal with agrarian sustainability [Bachev, 2004; Bachev, 2007]. This new approach requires embracing *all modes of governance* affecting individuals behavior which includes:

– *the institutional environment (the “rules of the game”)* – that is the distribution of rights and obligations between individuals, groups, communities and generations, and the system(s) of enforcement of these rights and rules. In the modern society a great deal of the individuals activities and relations are regulated by some (general) formal and informal rules. However,

there is no perfect system of preset outside rules that can govern effectively the entire activities of individuals in all possible (and quite specific) circumstances of their life and relations.

– *the market modes* – those are various decentralized initiatives governed by the free market price movements and market competition (e.g. spotlight exchanges, classical contracts, production and trade of organic products and origins, system of fair-trade etc.). The importance of the “invisible hand” of market for the effective coordination and stimulation of individuals activities has been one of the fundamentals of the modern economy (and policies for development and globalization). However, there has been also a great number of “market failures” compromising the sustainable development and leading to social crisis, economic crisis, ecological crisis, energy crisis etc.

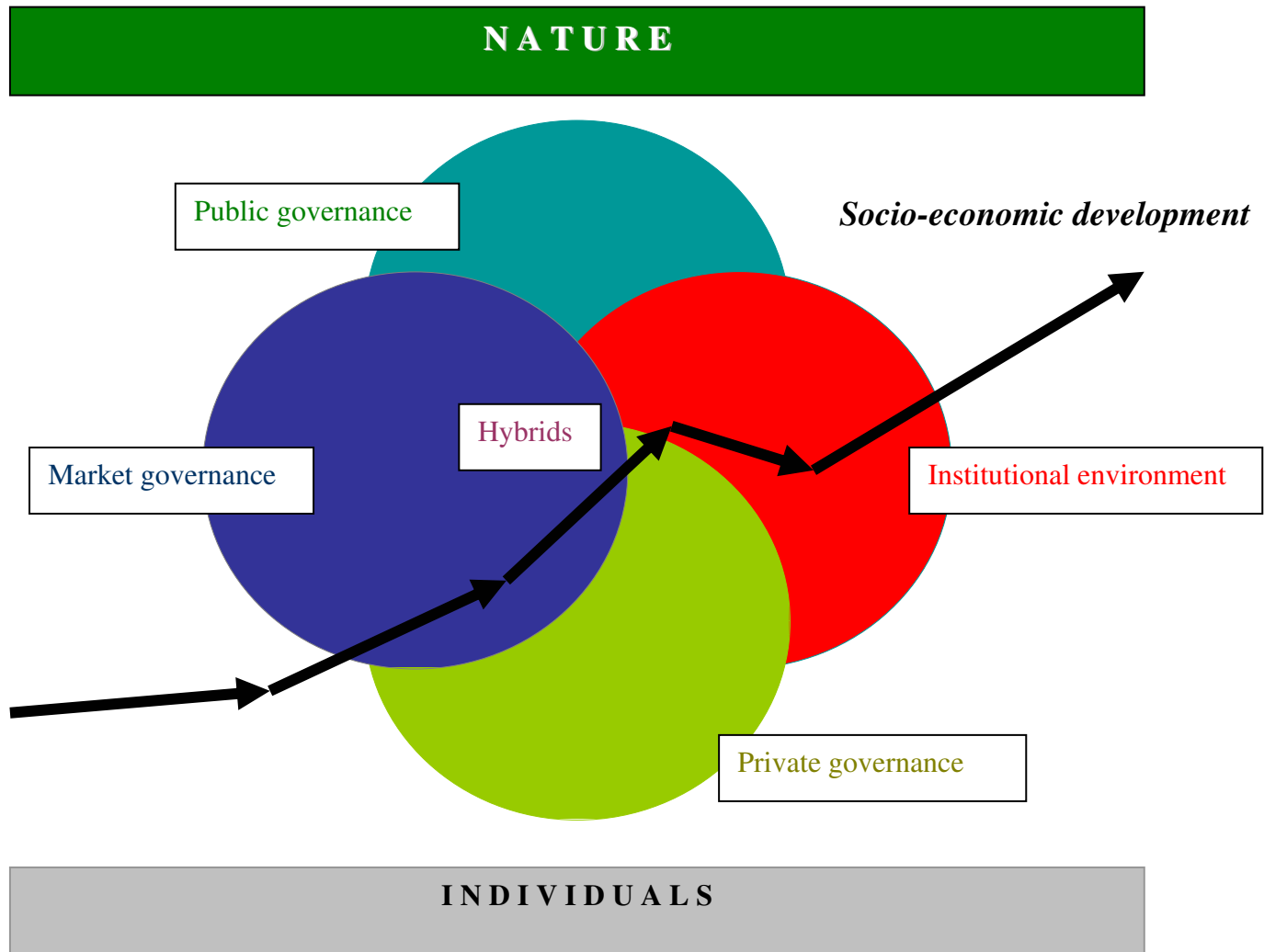
– *the private modes (“private or collective order”)* – those are diverse private initiatives, and specially designed contractual and organizational arrangements governing bilateral or multilateral relationships between private agents (e.g. voluntary individual or collective actions, codes of professional behavior, environmental contracts, eco-cooperatives etc.). There has been emerging a great number of private and collective forms managed by the “visible hand of the manager”, collective decision-making, private negotiations etc. governing successfully various aspects (and challenges) of the sustainable development. Nevertheless, there exist abundant examples of “private sector failures” (lack of potential to coordinate and stimulate sustainability) demonstrating the incapability to deal effectively with the problems of development.

– *the public modes (“public order”)* – these are various forms of a third-party public (Government, community, international) intervention in market and private sectors such as public guidance, public regulation, taxation, public assistance, public funding, public provision etc. The role of the public (local, national and transnational) governance has been increasing along with the intensification of the activity and exchange, and the growing interdependence of the social, economic and environmental activities (and related problems and risks). In many cases, the effective organization of certain activity through a market mechanism (price competition) and/or a private negotiation would take a long period of time, be very costly, could not reach a socially desirable scale, or be impossible at all. Thus a centralized public intervention could achieve the willing state of the system faster, cheaper or more efficiently. Nonetheless, there has been a great number of bad public involvements (inaction, wrong intervention, over-regulation etc.) leading to significant problems of the sustainable development around the globe.

– *the hybrid forms* – some mixture combining features of the market and/or private and/or public governance (e.g. the state certifies the organic producers and enforces the organic standards, and thus intensifies the development of organic markets and environmental sustainability).

In *one person* world there is no need for (any) governance since the sustainable relations between that person and the nature are achieved through a simple (production and/or consumption) management (“self-governance”). However, in the real world of limited resources, complex social interactions between many individuals (division, specialization and cooperation of labor, intensive exchanges) and conflicting interests, there is a need for a *special governing mechanism* to direct, coordinate, stimulate, induce and enforce individuals efforts to accomplish a sustainable development. The achievement of the state of an overall efficiency (the maximum social welfare, sustainability) is driven by various *social arrangements* – preset formal and informal rules (institutional environment), competition, contracting, cooperation, profit-making or non-for profit activity, collective actions, pure private order, public order, voluntary initiatives, mixed modes etc. Depending on the *efficiency of the system of governance* which is put in place, the outcome of the development is quite different (Figure 1).

Figure 1: Governing mechanisms for sustainable development



Therefore, all systems for the assessment of sustainability *must* include not only the outcome(s) of the process, that is the “current” level (the state) of sustainability. The evaluation is to embrace the *system of governance* put in place, that is the *social mechanism* responsible for the outcome. Otherwise, mere analysis of the state or trend indicators would give no adequate picture for the ability of the system to improve, sustain, or adapt to a new sustainable level. Thus the problem for *assessing the efficiency* of individual *governing mechanisms* and for *selecting the most efficient* one(s) is very important. The New Institutional Economics gives us a good framework to answer this key question.

Costs of governance

Transaction costs are the costs associated with the protection and the exchange of individuals’ rights [Furuboth and Richter]. In addition to the production costs, the economic

agents make significant costs *for the coordination of their relations with other individuals*⁶: for finding best prices and partners for land, inputs and labor supply, financing, and marketing of outputs and services; for negotiating the conditions of exchange; for completing and “writing down” contract or setting up a partnership organization (coalition); for coordination through a collective decision-making or direct managerial orders; for enforcing negotiated terms through monitoring, controlling, measuring and safeguarding; for disputing through a court system or another way; for adjusting or termination along with the changing conditions of exchange.

The institutional environment and its development also *impose significant transaction costs to individuals* – e.g. for studying out and complying with various institutional restrictions (community or state norms, regulations, standards etc.), formal registration of contracts and entities, efforts to deal with bureaucracy etc. A good example in this respect are current problems of many Bulgarian farms to meet the new EU requirements (“institutionally determined” costs) related to new product quality, food safety, labor, environmental, animal welfare etc. standards [Bachev, 2008].

The transaction costs have two *behavioral origins*: individual’s *bounded rationality* and *tendency for opportunism* [Williamson]. The economic agents do not possess full information about the system (price ranges, trade opportunities, adverse effects of their activities on others, trends in development) since the collection and the processing of such information would be either very expensive or impossible (e.g. for future events, for partners intention for cheating, time and space discrepancy between individual action and adverse impacts on others etc.). In order to optimize decision-making (to reach the state of efficiency and sustainability) they have to spent costs for “increasing their imperfect rationality” - for data collection, analysis, forecasting, training etc.

The individuals are also given to opportunism and if there is an opportunity for some of the transacting sides to get non-punishably an extra rent from the exchange (performing *unwanted* exchange) he will likely “steal” the rights of others. Two major forms of opportunism can be distinguished: *pre-contractual* (“adverse selection”) - when some of the partners use the “information asymmetry” to negotiate better contract terms; and *post-contractual* (“moral hazard”) - when some counterpart takes an advantage of impossibility for full observation on his activities (by another partner or by a third party) or when he take “legal advantages” of the unpredicted changes in transacting conditions (costs, prices, environment etc.). A special third form of opportunism occurs in the *development of large organizations* (known as “free-riding”). Since the individual benefits are often not proportional to the individual efforts, everybody tends to expect others to invest costs for the organizational development and later on to benefit (“free riding”) from the new organization [Olson].

Commonly, it is very costly or impossible to distinguish the opportunistic from non-opportunistic behavior (because of the bounded rationality). Therefore, agrarian agents have to protect their transactions and rights from the hazard of opportunism through: *ex ante* efforts to protect their “absolute” (given by dominating institutions) rights, and find a reliable counterpart and to design an efficient mode for partners credible commitments to the “contracted” (voluntary transferred) rights; and *ex post* investments for overcoming (through monitoring, controlling, stimulating cooperation) of possible opportunism during contract execution stage.

If transaction costs were *zero* then the mode of the governance would not be of economic importance. In such a world the individuals would manage their relations with an *equal efficiency* though free market, or through private organizations of different types, or in a single nationwide company. All information for the effective potential of transactions (exploration of technological opportunities, satisfying various demands, respecting assigned and transferred

⁶ The *production costs* are the cost associated with the proper *technology* (combination of production factors) of certain farming, servicing, environmental, community development etc. activity. The *transaction costs* are the costs for governing the economic and other *relations* between individuals.

rights) would be costlessly available. And the individuals would costlessly protect their (absolute and contracted) rights, and trade owned resources in mutual benefit until exhausting the possibilities for increasing productivity, maximizing the consumption, and the sustainable development⁷.

However, very often the high costs make it difficult or block otherwise efficient (mutually beneficial) transactions. We have already mentioned the textbook cases of “market failure” connected with the *negative* and *positive externalities*. Since free-market prices do not reflect the effect on the third party’s welfare they cannot govern effectively the relations between individuals. The maximization of the social output (welfare) is not achieved, and inefficient allocation of resources and activities, and unsustainable development arrives. Hence farmers will over-produce “public bads” (noise, air, and water pollution) and under-produce “public goods” (rural amenities, ecological and cultural services; habitat for wildlife, biodiversity). That necessitates a “*Government intervention*” to eliminate the differences between the *social* and the *private* prices (an “internalization of externalities” through taxes, norms etc.).

The problem of “social costs” does not exist in the world of zero transaction costs and well-defined private rights [Coase]. Here the situation of maximum efficiency is always achieved independent of the initial allocation of rights. However, when transaction costs are significant, then costless protection, negotiation and exchange of rights is impossible. The initial allocation of property rights between individuals is critical for the overall efficiency and sustainability. Moreover, if rights on important resources are not well-defined (e.g. rights on clean air and water) that creates big difficulties in effective allocation (e.g. unsolvable costly disputes between polluting farmers and neighborhood). Consequently, some essential activities (and transactions) are not carried out at *socially effective scale*, and the existing governing structures less contribute to sustainable development [Bachev, 2007].

Thus the *type of the governance* becomes crucial since various modes give unequal possibilities for participants to coordinate activities, and stimulate an acceptable behavior of others (counterparts, dependents), and protect their contracted and absolute rights from unwanted expropriation [Williamson]. In the world of *positive* transaction costs the *rational* agrarian agents will seek, chose, and develop such modes for governing of their activities and relations with others which maximize their benefits and minimize their *total* (production *and* transacting) costs. In the *long run* only *efficient* modes for governing of different activities *will prevail* (sustain) in agriculture [Bachev, 2004].

However, the sustainability of agrarian structures is a necessary⁸ but *not a sufficient* condition for the sustainable development [Bachev and Peeters]. The overall *goals* of sustainable development cannot be automatically achieved through totally decentralized actions (free market competition, private initiatives). There is a need for a *special* (designed and installed) *governance* which include a significant public (community, national, transnational, global) intervention in the agrarian sector.

There is not a single (universal) mode for an effective organization of *all type* of agrarian activity in *any possible* natural, institutional, and economic surroundings [Bachev, 2004]. The individual governing forms have *distinct features* (different advantages and disadvantages) to protect rights and to coordinate and stimulate the socially desirable activities. Besides, the agents have specific *personal characteristics* – different awareness, entrepreneurships, preferences, risk aversion, tendency for opportunisms etc. Furthermore, efficiency of the governing mode will

⁷ Currently, there is a *principle agreement* (a “*social contract*”) for a *global sustainable development*.

⁸ According to the most opinions the *sustainability of farms* is one of the major *criteria* (and an indicator) for the *sustainable agrarian development* [Sauvenier *at al.*]. In fact, the experience of beef, pig, and poultry sectors of developed countries shows that financial stability (security) for farmers increases after transformation from the independent operators (traditional family farm) into hired laborers of the vertically integrated industries [Martinez; Sporleder].

depends on the *specific attributes* of each activity and transaction. Therefore, the *individual* transaction and the transaction costs is to be put in the *centre* of the analysis, and the *comparative efficiency* of the feasible modes for governing of *socially desirable* activities assessed [Bachev, 2007].

Principle governance matrix

Generally, every agrarian activity and transaction could be governed through a great variety of *alterative* forms. For instance, a *supply of environmental preservation service* could be governed as: a *voluntary* activity of a farmer; though *private contracts* of the farmer with interested or affected agents; though an *interlinked contract* between the farmer and a supplier or a processor; though a *cooperation* (collective action) with other farmers and stakeholders; though a (free) *market* or assisted by a third-party (a certifying and controlling agent) *trade* with special (eco, protected origins, fair-trade etc.) products; though a *public contract* specifying farmer's obligations and compensation; though a *public order* (regulation, taxation, quota for use of recourses or emissions); within a hierarchical *public agency* or by a *hybrid* form.

The different governance modes are alternative but not equal modes for the organization of activities. The *free market* has a big coordination and incentive advantages ("invisible hand", "power of competition"), and provides "unlimited" opportunities to benefit from the specialization and the exchange. However, market governance could be associated with a high uncertainty, risk, and costs due to the price instability, the great possibility for facing an opportunistic behavior, the "missing market" situation etc. The *special contract form* ("private ordering") permits a better coordination, intensification, and safeguard of transactions. However, it may require large costs for the specification of contract provisions, for adjustments with constant changes in the conditions, for enforcement and disputing of negotiated terms etc. The *internal (ownership) organization* allows a greater flexibility and control on transactions (direct coordination, adaptation, enforcement, and dispute resolution by a *fiat*). However, the extension of the internal mode beyond the family and small-partnership boundaries (allowing achieving the minimum technological or agronomic requirements; exploration of technological economies of scale and scope) may command significant costs for development (initiation and design, formal registration, restructuring), and for current management (for collective decision making, control on the coalition members opportunism, supervision and motivation of hired labor etc.).

In order to select the *best (most efficient) form* for governing of a particular activity we have to assess the *comparative* advantages and disadvantages of *practically possible* forms for governance of that activity. In *some cases* the advantages of a certain mode of governance are not difficult to verify - e.g. when it gives *bigger benefits* (achieves the socially desirable/effective scale) or commands *minimum total costs* etc. In such cases the choice of the most effective form of governance is easy since we can compare *directly* costs and benefits of alternatives. For instance, in most countries much of the agrarian activity is commonly governed in some sort of *family farm*, the supply of inputs or exchange of farm output are governed by *market modes* etc.

However, in many instances, the *direct* assessment (the comparison) of the costs and the benefits of the alternative governing arrangements are difficult or impossible to make. That is particularly true for some *elements* of the *transaction costs* related to divers governance structures. In the later group we can include the costs for finding best partners, for negotiation, for controlling and enforcement of contractual terms, for organizational development, for interlinked transacting, for unrealized (failed) deals etc. [Bachev, 2004].

The discrete structural analysis is suggested to evaluate the *comparative efficiency* of the alternative governing forms [Williamson]. Here the assessment of the absolute levels of transaction costs of the alternative governing structures is not necessary. This approach aims to

evaluate the *relative* levels of transacting costs between alternative modes of governance, and selecting that one which most economize on transacting costs.

Following that framework **first** we have to identify the “*critical dimensions*” of transactions responsible for the *variation* of transaction costs. The “frequency”, “uncertainty”, and “asset specificity” have been identified as *critical factors* of the transaction costs by Williamson [Williamson] while the “appropriability” has been added by Bachev and Labonne [Bachev and Labonne].

When the *recurrence* of transactions *between the same partners* is high, then both (all) sides are interested in sustaining and minimizing costs of their relations (avoiding opportunism, building reputation, setting up adjustment mechanisms etc.). Besides, the costs for development of a special private mode for facilitating bilateral (or multilateral) exchange could be effectively recovered by frequent exchange.

When the *uncertainty*, which surrounds transactions increases, then costs for carrying out and secure the transactions go up (for overcoming information deficiency, safeguarding against risk etc.). Certain risks could be diminished or eliminated by a production management or through a special market mode (e.g. purchase of an insurance). However, the governance of most transacting risk would require a special private forms – e.g. trade with origins; providing guarantees; using share-rent or output-based compensation; employing economic hostages; participating in a risk-pooling, inputs-supply or marketing cooperative; a complete integration [Bachev and Nanseki].

The transaction costs get very high when *specific assets for the relations with a particular partner* are to be deployed⁹. The relation specific investments are "locked" in transactions with a particular buyer or seller, and cannot be recovered through a "faceless" market trade. Therefore, *dependant* investment (assets) have to be safeguarded by a special form such as long-term contract, interlinks, hostage taking, joint investment, or ownership integration.

The transacting is particularly difficult when the *appropriability* of rights on products, services or resources is low. "Natural" low appropriability has most of the agrarian intellectual products - agro-market information, agro-meteorological forecasts, new varieties and technologies, software etc. Besides, all products and activities with significant (positive or negative) externalities are to be included in this group. If the appropriability is low the possibility for *unwanted* (market or private) exchange is great, and the costs for protection of private rights (safeguard, detection of cheating, disputing) extremely high. The agents would either over produce (negative externalities) or under organize such activity (positive externalities) unless they are governed by an efficient private or hybrid mode (cooperation, strategic alliances, long-term contract, trade secrets, or public order).

Secondly, we have to “*align* transactions (differing in their attributes) with the governance structures (differing in their costs and competence) in discriminating (mainly in transaction cost economizing) way” [Williamson]. According to the *combination* of the specific characteristics of each transaction, there will be *different the most effective form* for governing of activity (Figure 2). Agrarian transactions with a good appropriability, high certainty, and universal character of investments (the partner can be changed anytime without significant additional costs) could be effectively carried *across the free market* through *spotlight* or *classical contracts*. Here the organization of transactions with a special form or within the farm (firm) would only bring extra costs without producing any transacting benefits.

⁹ Specificity is not a technological but *transacting* characteristic of the assets. In one situation a particular capital (investment) could be highly *universal* (easy deployment to another internal usage or outside trade) while in others - highly *specific* (a big dependency from the relations with a certain counterpart (buyer or seller)).

Figure 2: Principle modes for governing of transactions¹⁰

Generic modes	Critical dimensions of transactions								
	Appropriability								
	High							Low	
	Assets Specificity								
	Low				High				
	Uncertainty								
	Low		High		Low		High		
	Frequency								
	High	Low	High	Low	High	Low	High	Low	
Free market	Y	Y							
Special contract form			Y			Y			
Internal organization					Y		Y		
Third-party involvement				+				+	
Public intervention									+

Y - the most effective mode; + - a necessity for a third party involvement

The recurrent transactions with low assets specificity, and a high uncertainty and appropriability, could be effectively governed through a *special contract*. The *relational contract* is applied when detailed terms of transacting are not known at outset (a high uncertainty), and a framework (mutual expectations) rather than a specification of the obligations is practiced. The partners (self)restrict from opportunism and are motivated to settle the emerging difficulties and continue relations (the situation of a frequent bilateral trade). Besides, no significant risk is involved since investments could be easily (costlessly) redeployed to another use or users (no assets dependency exist).

A special contract forms is also efficient for rare transactions with a low uncertainty, high specificity and appropriability. The dependent investment could be successfully safeguarded through the contract provisions since it is easy to define and enforce the relevant obligations of partners in all possible contingencies (no uncertainty surrounds transactions). Here the occasional character of the transactions does not justify the internalization within the farm (firm).

The transactions with a high frequency, a big uncertainty, a great assets specificity (dependency), and a high appropriability, have to be organized *within the farm/firm* (the internal ownership mode). For instance, the managerial and the technological knowledge is quite specific to a farm, and its supply has to be always governed through a permanent labor contract and coupled with the ownership rights [Bachev, 2004]. The capital investments in land are to be made on owned (or long-leased) rather than a seasonally rented land (high site and product specificity). All “critical” to the farm material assets will be internally organized - production of forage for animals; important machineries; water supply for the irrigated farming etc. While the universal capital could be effectively financed by a market form (e.g. a bank credit), the highly

¹⁰ The differences in the personal characteristics of the agents are *disregarded*. Only the *extreme levels* (high-low) of the critical factors of transactions are considered. In the real agrarian economy there is a big *variation* of the critical dimensions, and thus of the effective governing forms (including mixed, hybrid, interlinked etc. governance).

specific investments can be only made through an internal funding (own funds, equity sell, joint venture).

According to the *personality* of resource owners and the (transacting) *costs of their coalition*, different *type of farm (agro-firm)* will be efficient - one-person farm, family farm, partnership, cooperative farm, and corporative farms [Bachev, 2004]. If the specific and specialized capital cannot be effectively organized within the farm (economy of scale and scope explored, funding made)¹¹, then an effective governing form *outside farm-gates* is to be used - group farming, joint ownership, interlinks, cooperative, lobbying for a public intervention. When the strong *assets* (capacity, time of delivery, site, branding) *inter-dependency* with an upstream or downstream partner exists, then it is not difficult to govern transactions through a *contract modes* (strong mutual interests for cooperation and restriction of opportunism). For instance, in Germany and some other developed countries the effective cooperative agreements between farmers and drinking water companies are widely used (symmetrical dependency) and led to production methods protecting water from pollution [Hagedorn].

However, very often farmers face a *unilateral dependency* and need an effective (ownership) organization to protect their interests. The transacting costs for initiation and maintaining of such “collective organization” is usually great (big number of the coalition, different interests of the members, opportunism of “free-riding” type) and it is either unsustainable or does not evolve at all. That creates serious problems for the efficiency (and sustainability) of individual farms - missing markets, monopoly or quasi-monopoly situation, impossibility to “induce” a public intervention etc.

Third, we have to identify the situations of *market and private sector failures* – that is the *critical points* for the sustainable development. Serious transacting problems arise when the condition of assets specificity is combined with a high uncertainty, low frequency, and good appropriability (Figure 2). Here the elaboration of a special governing structure for a private transacting is not justified, the specific investments are not made, and the activity (or restriction of activity) fails to occur at an effective scale (“market failure” and “contract failure”). Similar difficulties are also encountered for rare transacting associated with a high uncertainty and appropriability. In these cases, a *third part* (private agent, NGO, public authority) *involvement* in transactions is necessary (through assistance, arbitration, regulation) in order to make them more efficient or possible at all. For instance, when State establishes and enforces quality and safety standards for farm inputs (chemicals, machinery) and produces, or certify providers of agrarian services, or regulate employment relations, or guarantee minimum price for farmers, all that considerably facilitates and intensifies (market and private) transactions and increases farm sustainability. The emergence and unprecedented development of the organic farming and the system of fair-trade are also good examples in that respect. There is an increasing consumer’s demand (a price premium) for the organic, semi-organic and fair-trade products in developed countries. Nevertheless their supply could not be met unless effective *trilateral governance* (including an independent certification and control) has been put in place.

When the appropriability associated with a transaction is low, there is no pure market mode to protect and carry out activity effectively. Nevertheless, the *respecting* others rights (unwanted exchange avoided) or the “*granting*” additional rights to others (needed transactions carried) could be governed by a “*good will*” or *charity actions* of individuals, NGOs, government or international organizations. For instance, a great number of voluntary environmental initiatives (agreements) have emerged driven by the competition in the food industries, the farmers’ preferences for eco-production, and the responds to the public pressure for a sound

¹¹ The integration of transactions would either increase the management costs (needs to buy from or sell to a competitor) or it would be loss-making comparing to the outside production costs (price) competition.

environmental management¹². However, the environmental standards are usually “process-based”, and “environmental audit” is not conducted by an independent party, which does not guarantee a “performance outcome”. Therefore, most of these initiatives are seen as a tool for the external image manipulation. Recent huge food safety, animal safety, and eco-scandals have demonstrated that such private schemes could often fail (high bounded rationality and possibility for opportunism).

In any case, the voluntary initiatives could hardly satisfy the entire social demand especially if they require significant costs. Some *private modes* could be employed if a high frequency (a pay-back on investment is possible) and a mutual assets dependency (thus an incentive to cooperate) exists¹³. In these instances, unwritten accords, interlinking, bilateral or collective agreements, close-membership cooperatives, codes of professional behavior, alliances, internal organization etc. are used. However, emerging of special *large-members* organizations for dealing with low appropriability (and satisfying the entire “social” demand) would be very slow and expensive, and they unlikely be sustainable in a long run (“free riding” problem). Therefore, there is a strong need for a *third-party public* (Government, local authority, international assistance etc.) *intervention* in order to make such activity possible or more effective [Bachev, 2004].

For example, the supply of environmental goods by farmers could hardly be governed through private contracts with the individual consumers because of the low appropriability, high uncertainty, and rare character of transacting (the high costs for negotiating, contracting, charging all potential consumers, disputing etc.). At the same time, the supply of additional environmental protection and improvement service is very costly (in terms of production and organization costs) and would unlikely be carried out on a voluntary basis. Besides, the financial compensation (price-premium) of farmers by the willing consumers through a pure market mode is also ineffective due to the high information asymmetry, massive enforcement costs etc. A third-party mode with a direct public involvement would make that transaction effective: on behalf of the consumers the Government agency negotiates with the individual farmers a contract for “environment conservation and improvement service”, coordinates activities of various agents (including a direct production management), provides public payments for the compensation of farmers, and controls the implementation of negotiated terms¹⁴.

Farm as a governing structure

A significant amount of the agrarian activities is organized by different type *farms* and *farming organizations*. The New Institutional Economics gives a new insight for understanding the role of the farm and its sustainability [Bachev and Peeters]. The sustainability of a farm is to characterize farm’s ability to maintain (continue) over time. Since no economic organization would exist in a long-term if it were not efficient (otherwise it would be replaced by more efficient arrangement), the problem of assessment of sustainability of farms is directly related to estimation of the *factors* and the *level of farm efficiency*.

In the traditional (Neoclassical) framework, the farm is presented as a “*production structure*” and the analyses of efficiency are restricted to the *production costs* (“factors

¹² Unprecedented development of the “codes of behaviors”, eco-labeling and branding, environmental cooperatives, and “green alliances”, all they are good examples in that respect.

¹³ For instance, inter-dependency between a dairy farm and a milk processor in a remote region (capacity and site dependency); or a bee keeper and a neighboring orchard farm (symmetric dependency between needs of flower and needs for pollination).

¹⁴ Namely, *public environmental contracts* with individual farmers have been broadly used in EU as an effective form for governing the supply of environmental preservation and improvement services [EC].

productivity”, “optimization of technological factors according to marginal rule”). This approach fails to explain why (in any given country) for a long period of time there exist so many farms with different levels of “efficiency” (productivity). In Bulgaria for instance, the level of profitability and productivity in cooperative farms has been 5 times lower than in private farms. Besides, there have been one million highly sustainable subsistent and non-profit making farms in the country [Bachev, 2006].

In addition to the production costs, the modern farming is also associated with significant *transaction costs*. Therefore, the “rational” agrarian agents will seek, chose and/or develop the most effective (less expensive) mode for organization of their transactions that minimize their bounded rationality, and safeguard their investments and rights from the hazard of opportunism. When transaction costs are high, they could block otherwise effective transactions, and restrict the farm size far bellow the technologically optimal level. Very often the high costs for market trading (e.g. for finding a credit; marketing of output) and/or internal governance (e.g. deficiency of low transacting cost labor) limit the farm size to miniature subsistent farming or family borders [Bachev, 2004]. In other instances, the existing effective potential to economize on market transacting costs could cause a vast extension of farm size through a backward, lateral or forward integration of transactions. For example, the high costs for market and contract trading after 1990 has turned the subsistent farming into the most effective (or only possible) forms for organization of available agrarian assets (farmland, livestock etc.) of more than a million Bulgarians (Bachev, 2006). On the other hand, the enormous costs of market trading have caused a domination of integrated and interlinked modes of transacting, and a concentration of commercial farming in few thousands large agro-firms and cooperatives.

Thus in the world of positive transaction costs, farms and other agrarian organizations have a significant *economic role* to play. They are not only production but also a major *governing structure* – a form for organization of transactions and for minimization of transacting costs. Therefore, sustainability of different farms cannot be correctly understood and estimated without analyzing their comparative *production and governance* potential [Bachev and Peeters].

Generally, every farm related transaction could be governed through a great variety of alterative market, contract, integral etc. forms. Each of these governing modes gives individuals dissimilar opportunities to coordinate, stimulate, and control transactions, safeguard their investments from an opportunistic expropriation, and profit from the specialization, cooperation and exchange. For instance, *one-person farm* (firm) has zero internal transaction costs (one agent), but limited possibility for investment in specialized (and specific) human and material capital. The “internal” opportunities for increasing productivity (through investments, exploring economy of scale and size) increases along with the extension of the members of *coalition* (group farm, partnership). However, the later is also associated with an enlargement of the costs for making the coalition (finding complementary and reliable partners) and the internal costs for managing the coalition (for coordination, reducing bounded rationality, controlling opportunism etc.).

The *separation of ownership from the management* (cooperative, corporation) gives enormous opportunities for productivity growth but it is connected with huge transacting costs (for decreasing information asymmetry between management and shareholders, for decision making, for adaptation, for controlling opportunism of hired labor and between partners etc.). The *special contract* form combines the potential for a greater "control" on transactions with possibility to explore advantages of further specialization of activity. Nevertheless, it could be connected with large costs for preparing and enforcement of contracts for complex occasional transactions with high unilateral dependency. *Free market* has big coordination and incentive advantages (“invisible hand”, “power of competition”), and provides “unlimited” opportunities to benefit from specialization and exchange. However, market governance could be associated

with high uncertainty, risk, and costs due to price instability, great possibility for facing opportunistic behavior, “missing market” situation etc.

Protection of rights and economic exchanges let more profitable use of resources but also require additional costs. Farmers and other economic agents (resource owners, consumers) will tend to govern their activity and relations through the most effective forms – that which maximize their benefits and minimize their costs. Therefore, the most effective form and size of farm will be determined through *optimization of total (production and transacting) costs*, and *trade-offs* between the *gain in the productivity/benefits and the gain in transacting costs*. Hence farm will be efficient (sustainable) if it *manages all transactions in the most economical for the owner(s) way* – that is the situation when there exist no activity which could be carried out with a net benefit [Bachev, 2004]. If a farm does not govern activity or transactions effectively, it will be unsustainable since it experiences high costs and difficulties using institutions (possibilities, restrictions) and carrying out activity and transactions *comparing* to other feasible organization. In that case, there will be strong incentives for exploring the existing potential (*adapting to a sustainable state*) through reduction or enlargement of farm size, or via reorganization or liquidation of the farm. Thus either alternative farm or non-farm application of resources; or farm expansion through an employment of additional resources; or trade instead of internal use of owned land and labor; or taking over by (or merger with) another farm or organization¹⁵, will take place.

Furthermore, the transacting modes and the acceptable net benefits will vary according to the *individual's preferences, entrepreneurship ability, risk aversion, opportunity costs of owned resources etc.* Depending on the personality of resource owners and the (transacting) costs and benefits of their coalition, *different type of farm* will be preferred - *one-person farm (firm), family farm (firm), group farm or partnership (firm), cooperative farm, and corporative farms* [Bachev, 2004]. Expected *benefits for farmers* could range from the monetary or non-monetary income; profit; indirect revenue; pleasure of self-employment or family enterprise; enjoyment of agricultural activities; desire for involvement in environment, biodiversity, or cultural heritage preservation; increased leisure and free time; to other non-economic benefits¹⁶. Moreover, in the specific institutional environment (legal framework, support policies, tradition, access to new technology, level of transacting costs) various types of farm will have quite different effective *horizontal and vertical boundaries*. For instance, in *transitional* conditions of high market and institutional uncertainty, and inefficient property rights and contract enforcement system, most of the agrarian investments happened to be in a regime of high specificity (dependency). As a result (over)integrated modes such as low productive subsistent household and group farming, or large production cooperatives and agro-companies, have been dominating in Bulgaria and East Europe [Bachev, 2006]. Alternatively, in more matured economies, where markets are developed and institutions stable, the agrarian assets are with more universal character. Therefore, farm borders are greatly determined by the family borders, and more market and mixed (contract rather than entirely integrated) forms prevail.

In order to assess the farm's efficiency and sustainability we have to put the *individual* transaction in the *centre of analysis*, and assess the level of associated costs and benefits. The major types of farm transactions are associated with: the *know-how supply, innovation supply, land supply, labor supply, inputs supply, service supply, finance supply, insurance supply, and marketing of services and products* (Figure 3). The analysis is to embrace the *comparative*

¹⁵ In most developed countries, the sustainable development has been associated with the *disappearance* of the traditional farming organization in major sectors (poultry, beef, pig) which is *taken over* by or *integrated* into related industries.

¹⁶ A “desire for preservation of the farm for future generation” has been a major reason for the persistence (sustainability) of a great number of part-time farms in Japan [Bachev and Petters].

efficiency of the organization (governance) of every major transaction of the farm. If significant costs (difficulties) of some type of transacting in relation to the *feasible* alternatives is in place, then farm is to be considered as non-sustainable. Given the fact that an alternative form often diminish one type while increasing the other kind of transacting costs, and the widespread application of *complex modes* (e.g. interlinking credit supply with inputs supply and/or marketing), the *overall* (internal and external) *governance costs* of the farm *has to be taken into account*.

Figure 3 : Principle governing forms for functional areas of Bulgarian farms

Functional areas	Alternative governing modes		
	<i>Market contract</i>	<i>Special contract form</i>	<i>Special organization</i>
Supply of land and other natural resources	Purchase Short-term lease	Long-term lease with a fix rent Long-term lease with a share rent Long-term lease with a market rent	Cooperation Partnership
Labor supply	Daily hire Seasonal hire	Permanent labor contract with a fix remuneration Permanent labor contract with result based payment	Partnership Cooperation
Supply of short-term material assets	Purchase with a spotlight contract Standard contract	Long-term procurement contract Supply contract interlinked with a credit supply, service supply, and/or marketing of farm produce	Cooperation
Supply of long-term material assets	Purchase with a spotlight contract Standard contract	Long-term lease contract Contract for purchase interlinked with crediting (leasing) and/or services	Partnership Cooperation
Service supply	Purchase with a spotlight contract Standard contract	Long-term supply contract Supply contract interlinked with other services, products or crediting	Partnership Cooperation
Innovation and know-how supply	Purchase with spotlight contract Standard contract Free consultation in the farm advisory system	Long-term supply contract Supply contract interlinked with supply of material assets and/or crediting	Cooperation
Financing	Bank loan Loan from an individual agent Loan from a private organization	Co-investment Crediting interlinked with supply of material assets and services Contract with a public funding program	Partnership Cooperation
Insurance	Purchase of insurance Purchase of “assurance service”	Insurance contract interlinked with material assets Long-term insurance contract	Cooperation
Marketing of products and services	Retail sale Wholesale trade Standard contract	Long-term contract for marketing Marketing contract interlinked with crediting, supply of material assets and/or services	Partnership Cooperation

Next, farm’s *potential (incentives, ability) for adaptation* to the evolving market, institutional and natural environment through effective changes in the *governing forms* (saving on transacting costs) and the *production structure* (exploring technological possibilities for

growth in productivity) is to be estimated. Thus if a farm does not have a potential to *stay at* or *adapt to new* more sustainable level(s) it would be either liquidated or transformed into another type of farm. For instance, if a farm faces enormous difficulties meeting institutional opportunities and restrictions (e.g. new quality and environmental standards, production quotas); or it has serious problems supplying managerial capital (as it is in a one-person farm when an aged farmer has no successor), or supply of needed farmland (a big demand for non-agricultural use of land), or funding activities (insufficient own finance, impossibility to sell equity or buy credit), or marketing output (a changing demand for certain products, strong competition with the imported products), then it would not be sustainable despite the high historical or current efficiency. Currently there are numerous unsustainable farms in most EU countries, which can hardly adjust to the fundamental changes in CAP and associated enhanced competition and new food safety, environmental, animal welfare etc. standards.

Our new approach makes it clear that *sustainable development does not mean sustainable farms and agrarian structures* [Bachev and Peeters]. The farms and other modes of governance *evolve* (modernize, adapt, transfer, disappear) according to the changes in the social and natural environment. The development of the governance must be judged depending on the *contribution* of dominating and newly emerging forms of governance to *achieving* various (social, economic, environmental etc.) *goals of sustainable development*. Our approach also proves inadequacy of widely used indicators for productivity of “production costs and resources” for the assessment of the efficiency (viability, sustainability) of different farming organizations. Actually it is to be expected a significant differences in the rate of profitability on investments in an agro-firm (a "profit making organization") from the "pay-back" of expenditures and resources in a cooperative ("member oriented organization"), a public farm (a "non-for profit organization") or in a self-consistent farm (giving opportunity for productive use of otherwise "non-tradable" resources such as family labor, land etc.) [Bachev, 2004].

It is obvious that traditional statistical, accountancy and other data are little suitable to test and broadly apply our new approach for assessing efficiency (and sustainability) of farms. Here it is necessary to get *micro-economic* data for the different transactions governed by various types of farms as well as for the costs and benefits associated with alternative governing structures.

Effective modes for public intervention

There is a big variety of possible *forms for public intervention* in the market and private activities. The *comparative* analysis is to extend to the public modes and include: *firstly*, the *correspondence* of the public involvement to the real needs of development – the *identified needs for a third-party intervention* from Figure 2.

Secondly, an assessment of the *comparative* advantages of the alternative modes for public involvements comprising *all costs* – the direct (tax payer, assistance agency etc.) expenses, *and* the transacting costs of bureaucracy (for coordination, stimulation, mismanagement), *and* the costs for individuals' participation and usage of public modes (expenses for information, paper works, payments of fees, bribes), *and* the costs for community control over and for reorganization of the bureaucracy (modernization and liquidation of public modes), *and* the (opportunity) costs of public inaction.

And *third*, estimation of the *comparative efficiency* of selected form and the other practically possible (*feasible*) modes of governance of socially desirable activity such as partnership with private sector; property rights modernization etc. Accordingly, a public intervention is to be initiated *only* if there is overall *net benefit* - when the *effects are greater than additional* (individual and social) *costs for the third-party involvement* [Bachev, 2007].

Depending on the *uncertainty, frequency*, and necessity for the *specific investment of public involvement*, there will be different the most effective forms. Figure 4 presents an example with the public modes for effective interventions in the “environmental transactions”. Principally, the interventions with a low uncertainty and assets specificity would require a *smaller* Government organization (more regulatory modes; improvement of the general laws and contract enforcement etc.). When uncertainty and assets specificity of the transactions increases a *special contract mode* would be necessary – e.g. employment of public contracts for provision of private services, public funding (subsidies) of private activities, temporary labor contract for carrying out special public programs, leasing out public assets for private management etc. And when transactions are characterized with a high assets specificity, uncertainty and frequency then an *internal mode* and a *bigger public organization* would be necessary – e.g. permanent public employment contracts, in-house integration of crucial assets in a specialized state agency or public company etc.

Figure 4: Effective modes for public intervention in environmental transactions*

<i>Level of Uncertainty, Frequency, and Assets specificity</i>				
<i>Low</i>	←-----→			<i>High</i>
New property rights	Regulations	Taxes	Assistance and support	Public provision
Private rights on natural, biological, and environmental resources; Private rights for (non) profit management of natural resources; Tradable quotas (permits) for polluting; Private rights on intellectual agrarian property and origins; Private liability for polluting	Quotas for emissions, and use of products and resources; Regulations for use of GM crops; Bans for use of certain inputs and technologies; Norms for nutrition and pest management; Regulations for water protection against pollution by nitrates; Regulations for biodiversity and landscape management; Licensing for water use; Quality and food safety standards; Standards for good farming practices; Mandatory (environmental) training; Certifications and licensing; Compulsory environmental labeling; Designating environmental vulnerable and reserve zone; Set aside measures; Inspections, fines and, ceasing activities	Tax rebates, exception, and breaks; Environmental taxation on emissions or products (pesticides, fertilizers); Levies on manure surplus; Tax or levies schemes on farming or export for funding innovations and extension	Recommendation and information; Demonstration; Direct payments and grants for environmental actions of farms, and farmers and community organizations; Preferential credit programs; Environmental contracts; Government purchases (water and other limited resources); Price and farm support for eco-production; Funding of environment and management training programs; Assistance in farm associations	Research and development; Extension and advise; Agro-market and know-how information; Agro-meteorological forecasts; Sanitary and veterinary control; Specialized (quasi) public agency or company; Pertaining “precaution principle”

* *The environmental transactions are associated with respecting the environmental rights and improving the environmental performance of individual agents.*

In the beginning, the *existing and emerging problems* (difficulties, costs, risks, failures) in the organization of market and private transactions have to be specified. The appropriate government involvement would be to create an environment for: decreasing the uncertainty surrounding market and private transactions, and increasing the intensity of exchange, and protecting private rights and investments, and making private investments less dependent etc. For instance, the State establishes and enforces quality and safety standards for farm inputs and

produces, certifies service providers, regulates employment relations, transfers water management rights to farms associations, sets up minimum farm-gate prices etc. All that facilitates and intensifies (market and private) transactions and increases sustainability.

Next, practically possible modes for *increasing appropriability* of transactions have to be considered. The low appropriability is often caused by unspecified or badly specified private rights [Bachev, 2004]. In some cases, the most effective government intervention would be to introduce and enforce *new private property rights* – e.g. rights on natural, biological, and environmental resources; tradable quotas for polluting; private rights on intellectual agrarian property and origins etc. That would be efficient when the privatization of resources or the introduction (and enforcement) of new rights is not associated with significant costs (uncertainty, recurrence, and level of specific investment are low). That Government intervention effectively transfers the organization of transactions into the market and private governance, liberalizes market competition and induces private incentives (and investments) in certain activities (the relevant part in Figure 2). For instance, tradable permits (quotas) are used to control the overall use of certain resources or level of a particular type of pollution¹⁷. They give flexibility allowing farmers to trade permits and meet their own requirements according to their adjustment costs and specific conditions of production. That form is efficient when a particular target must be met, and the progressive reduction is dictated through permits while trading allows the compliance to be achieved at least costs (through a private governance). The later let also a *market for environmental quality* to develop¹⁸.

In other instances, it would be efficient to put in place *regulations* for trade and utilization of resources and products – e.g. standards for labor (safety, social security), product quality, environmental performance, animal welfare; norms for using natural resources, GM crops, and (water, soil, air, comfort) contamination; a ban on application of certain chemicals or technologies; foreign trade regimes; mandatory training and licensing of farm operators etc. The large body of environmental regulations in developed countries aim changing the farmers behavior and restricting the negative externalities¹⁹. It makes producers responsible for the environmental effects of their products or the management of products uses (e.g. waste). This mode is effective when a general improvement of the performance is desired but it is not possible to dictate what changes (in activities, technologies) is appropriate for a wide range of operators and environmental conditions (high uncertainty and information asymmetry). When the level of hazard is high, the outcome is certain and the control is easy, and no flexibility exists (for timing or the nature of socially required result), then the bans or strict limits are the best solution. However, the regulations impose uniform standards for all regardless of the costs for compliance (adjustment) and give no incentives to over-perform beyond a certain level.

In other instances, using the incentives and restrictions of the *tax system* would be the most effective form for intervention. Different sorts of tax preferences (exception, breaks, credits) are widely used to create favorable conditions for the development of certain (sub)sectors and regions, forms of agrarian organization, segment of population, or specific types of activities. The environmental taxation on emissions or products (inputs or outputs of production) is also applied to reduce the use of harmful substances. For instance, taxes on pesticides and fertilizer are used in Scandinavian countries and Austria to decrease their application and environmental

¹⁷ E.g. manure production quotas in Holland until recently, water abstraction licenses and water rights trading in UK and Australia, nutrition trading schemes in some US river catchments etc.

¹⁸ Permits can be taken out of market in order to raise the environmental quality above the “planned” (by the Government) level.

¹⁹ For instance, in EU there is a ban for spraying pesticides by airplane, burning after harvest, overhead irrigation of grassland; detailed regulations for nutrition and pest management, water protection against pollution by nitrates, biodiversity and landscape management; licensing for water use etc. Each country develops a system of “good farming practices” to set up specific codes for sustainable farming.

damaging impact²⁰. In Holland, levies on manure surplus were introduced in 1998 based on levies for nitrogen and phosphorus surpluses above a levy free surplus per hectare. The system creates strong incentives to minimize the leakages (and not just usage), and reduce the flexibility to substitute taxable for non-taxable inputs. However, it is associated with significant administrative and private costs²¹. The environmental taxes impose the same conditions for all farmers using a particular input and give *signals* to take into account the “*environmental costs*” inflicted on the rest of the society. Taxing is effective when there is a close link between the activity and the environmental impact, and when there is no immediate need to control the pollution or to meet the targets for reduction. Tax revenue is also perceived to be important to maintain budget and activities of special (e.g. environmental) programs. However, an appropriate level of the charge is required to stimulate a desirable change in farmers behavior²². Furthermore, the nitrogen emission can vary according to the conditions when nitrates are applied and attempting to reflect this in tax may result in complexity and high administrating costs. Besides, the distribution impact of such taxes must be socially acceptable, and the implications for international competitiveness also taken into account.

In some cases, a *public assistance and support* to private organizations is the best mode for intervention. Large agrarian and rural support and development programs have been widely used in all industrialized countries. They let a “proportional” development of agriculture, improvement of farmers welfare (“income parity”), and in some instances undesired effects such as over-intensification, environmental degradation, and market distortions.

The public *financial* support for the environmental actions is the most commonly used instrument for the improving environment performance of farmers in the EU and other developed countries²³. It is easy to find a justification for the public payments as a compensation for the provision of an “environmental service” by farmers. All studies shows that value placed upon landscape exceed greatly the costs of running the schemes. However, the share of farms covered by various agri-environmental support schemes is not significant [EC]. That is a result of the voluntary (self-selection) character of this mode which does not attract farmers with the highest environment enhancement costs (most intensive and damaging environment producers). In some cases, the low-rate of farmers’ compliance with the environmental contracts is a serious problem²⁴. The later cannot be solved by augmented administrative control (enormous enforcement costs) or introducing bigger penalty (politically and juridical intolerable measure). A disadvantage of “the payment system” is that once introduced it is practically difficult (“politically unacceptable”) to be stopped when goals are achieved or there are funding difficulties. Moreover, an withdraw of the subsidies may lead to further environmental harm since it would induce the adverse actions such as intensification and return to the conventional farming. The main critics of the subsidies are associated with their “distortion effect”, the negative impact on “entry-exit decisions” from polluting industry, the unfair advantages to certain sectors in the country or industries in other countries, not considering the total costs

²⁰ In Sweden tax is imposed on manufactures and importers at a fixed rate for active ingredient, and represents 20% of the fertilizers prices. In Denmark a different rate of sale tax is applied on retail prices of chemicals representing an average of 37% of the wholesale prices [ECOTEC].

²¹ Annual revenue of 7,3 millions Euro against the administration costs of 24,2 millions and compliance expenses at farm level between 220-580 per farms [ECOTEC].

²² In Scandinavia the introduction of such tax brought about a reduce use of pesticide. In contrast, doubling the tax rate in California had no discernable effect on sales [ECOTEC].

²³ In EU, USA, and Japan the public environmental contracts are mostly with the individual farmers while Canada, Australia, and New Zealand direct support to community (collective) actions.

²⁴ A study in France shows that 40% of the farmers face some difficulties to enforce contracts in their parts of the environmental impact [Dupraz *et al.*].

(transportation and environmental costs, and “displacement effect” in other countries). It is estimated that the agri-environmental payments are efficient in maintaining the current level of environmental capital but less successful in enhancing the environmental quality [EC].

Often providing *public information, recommendations, training and education* to farmers, other agrarian and rural agents, and consumers are the most efficient form. In some cases, a *pure public organization* (in-house production, public provision) will be the most effective as in the case of agrarian research and education, agro-market information, agro-meteorological forecasts, border sanitary and veterinary control etc.

Usually, the specific modes are effective if they are applied *alone with other modes* of public intervention. The necessity of *combined* intervention (a *governance mix*) is caused by: the complementarities (joint effect) of the individual forms; the restricted potential of some less expensive forms to achieve a certain (but not the entire) level of the socially preferred outcome; the possibility to get an extra benefits (e.g. “cross-compliance” requirement for participation in EU support programs); the particularity of the problems to be tackled; the specific critical dimensions of the governed activity; the uncertainty (little knowledge, experience) associated with the likely impact of the new forms; the practical capability of Government to organize (administrative potential to control, implement) and fund (direct budget resources and/or international assistance) different modes; and not least important the dominating (right, left) policy doctrine [Bachev, 2007].

Besides, the *level* of an effective public intervention (governance) depends on the kind of the problem and the scale of intervention. There are public involvements which are to be executed at *local* (community, regional) level, while others require *nationwide* governance. And finally, there are activities, which are to be initiated and coordinated at *international* (regional, European, worldwide) level due to the strong necessity for *trans-border actions* (needs for a cooperation in natural resources and environment management, for exploration of economies of scale/scale, for governing of spill-overs)²⁵ or consistent (national, local) *government failures*. Very frequently the effective governance of many problems (risks) requires *multilevel* governance with a system of combined actions at various levels involving diverse range of actors and geographical scales.

The public (regulatory, inspecting, provision etc.) modes must have built *special mechanisms* for increasing the *competency* (decrease bounded rationality and powerlessness) of the bureaucrats, beneficiaries, interests groups and public at large as well as restricting the possible *opportunism* (opportunity for cheating, interlinking, abuse of power, corruption) of the public officers and other stakeholders. That could be made by training, introducing new assessment and communication technologies, increasing transparency (e.g. independent assessment and audit), and involving experts, beneficiaries, and interests groups in the management of public modes at all levels [Bachev, 2007]. Furthermore, applying “*market like*” mechanisms (competition, auctions) in the public projects design, selection and implementation would significantly increase the incentives and decrease the overall costs.

Principally, a *pure* public organization should be used as a *last resort* when all other modes do not work effectively [Williamson]. The “in-house” public organization has higher (direct and indirect) costs for setting up, running, controlling, reorganization, and liquidation. What is more, unlike the market and private forms there is *not an automatic mechanism* (such as competition) for sorting out the less effective modes²⁶. Here a *public “decision making”* is required which is associated with high costs and time, and it is often influenced by the strong private interests (the power of lobbying groups, policy makers and their associates, employed bureaucrats) rather than the efficiency. Along with the development of general *institutional environment* (“The Rule of

²⁵ Recent epidemic of avian infection is a good example in that respect.

²⁶ It is not rare to see highly inefficient but still “sustainable” public organizations around the world.

Law”) and the measurement, communication etc. *technologies*, the efficiency of pro-market modes (regulation, information, recommendation) and contract forms would get bigger advantages over the internal less flexible public arrangements [Bachev, 2007].

Usually *hybrid modes* (public-private partnership) are much more efficient than the pure public forms given the coordination, incentives, and control advantages. In majority of cases, the involvement of farmers, farmers organizations and other beneficiaries increase efficiency - decrease asymmetry of information, restrict opportunisms, increase incentives for private costs-sharing, reduce management costs etc. [Bachev, 2007] For instance, a hybrid mode would be appropriate for carrying out the supply of non-food services by farmers such as the preservation and improvement of biodiversity, landscape, and historical and cultural heritages.²⁷ That is determined by the farmers information superiority, the strong interlinks of that activity with the traditional food production (economy of scope), the high assets specificity to the farm (farmers competence, high site-specificity of investments to the farm and land), and the spatial interdependency (a need for cooperation of farmers at a regional or wider scale), and not less important – the farm’s origin of negative externalities. Furthermore, the enforcement of most labor, animal welfare, biodiversity etc. standards is often very difficult or impossible at all. In all these cases, stimulating and supporting (assisting, training, funding) the private voluntary actions are much more effective than the mandatory public modes in terms of incentive, coordination, enforcement, and disputing costs [Bachev, 2004].

Anyway, if there is a strong need for a third-party *public* involvement but an *effective* government intervention is not introduced in a due time, the agrarian “development” would be substantially deformed. Thus the *Government failure is also possible* and often prevails. In Bulgaria for instance, there have been a great number of *bad* examples for Government under- and over-interventions in agrarian sector during post-communist transition now [Bachev, 2006]. Consequently, a primitive and uncompetitive small-scale farming; predominance of over-integrated and personalized exchanges; ineffective and corrupted agrarian bureaucracy; blocking out of all class of agrarian transactions (such as innovation and extension supply, long-term credit supply, supply of infrastructure and environmental goods); and development of a large informal (gray) sector, all they have come out as a result.

Steps for analyzing and improvement of governance

The *analysis* and the *improvement* of the governance of agrarian sustainability have to go through following major steps:

Firstly, an *assessment* is to be made on the *economic, social, environmental etc. sustainability* of different agricultural systems (parcel²⁸, farm, eco-system, regional, national etc.), and the *existing and emerging problems and risks* are to be *identified* (Figure 5). There are developed and practically used a great number of *holistic systems* for assessing the sustainability level of divers agricultural systems [Sauvenier *et al.*; OECD, 2008; VanLoon]. The identified problems of sustainability could be *internal* for a particular agricultural system or caused by *other* or larger systems²⁹. In any case, a *persistence* of serious environmental, social and economic challenges (*problems, conflicts, risks*) is a credible *indicator* that an effective *system of*

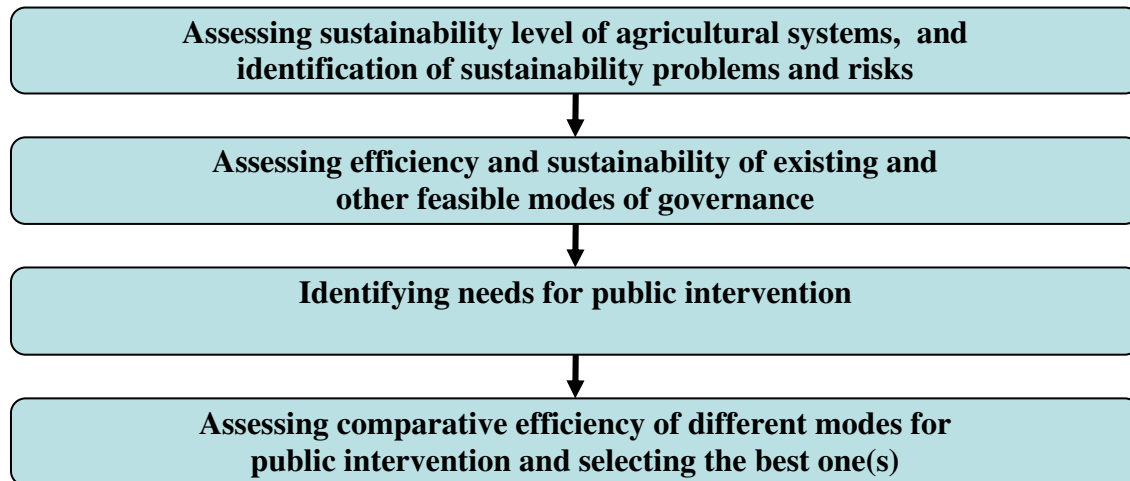
²⁷ The environmental cooperatives are very successful in some EU countries like Holland and Finland [Hagedorn].

²⁸ Commonly, the *parcel* is defined as the smallest (the lowest level) agricultural system [Sauvenier *et al.*; VanLoon]. However, the parcel management is an *integral part* of the farm governance. That is why detected sustainability problems at parcel level could *only* be tackled with farm and/or higher level governance.

²⁹ In globalise economy many of the factors affecting adversely agrarian sustainability are *external* for agriculture - global warning, global financial and economic crisis, regional water crisis etc.

*governance is not put in place*³⁰. The modern science increasingly offers quite precise methods both: to *detect* various (ecological, social etc.) *problems* and risks associated with the agriculture as well as to *improve farming systems* in order to mitigate environmental and other hazards caused by agriculture and other (man-made or natural) factors.

Figure 5: Steps in analysis and improvement of governance of sustainability



Secondly, the spectrum of *existing* and other *practically possible* modes of governance (institutions; market, private, public and hybrid forms) employed in agriculture has to be *identified*, and their *efficiency and sustainability assessed*. The evaluation of *efficiency* of individual modes will show their *ability* (potential) to *deal with* various *challenges of* and *contribute to* agrarian sustainability at *different levels*. In addition, the assessment of *sustainability* of existing governing structure is necessary to get an idea about its “internal” *potential to adapt* (evolve, modernize, transform) to dynamic economic, institutional and natural environment, and meet effectively the *new* (future) challenges and goals of sustainable development³¹. All these would let us know *whether* (and *the extend to which*) there will be an efficient response to sustainability objectives and challenges *within the existing system* of governance.

Third, the serious *deficiencies* (failures) in dominating *market, private, and public* modes to solve existing and emerging problems (risks, goals) of agrarian sustainability are to be *specified*, and the *needs for a (new) public intervention identified*. That step is to include an analysis of the *structure and factors* of transaction costs at *nationwide* (social) scale, which eventually slow down the sustainable growth of agrarian sector and different regions, and lead to insufficient and unsustainable use of resources, underinvestment and low productivity in production, lack of innovations, holdup of social cohesion of agrarian actors etc.

Finally, the *alternative* modes for public intervention to *correct* the existing market, private sector and public sector failures have to be *identified* (e.g. assistance, regulation, property rights modernization etc.); and their *comparative efficiency assessed* in terms of contribution to sustainability and minimization of total social costs; and the *most efficient one(s) selected*. It is

³⁰ It shows that *needed* social, economic, environmental preservation etc. activity is not carried at *effective* (socially desirable) scale.

³¹ Often some governing modes are highly efficient in “current” economic, social and natural environment but unable to adapt (sustain) to evolving new (future) challenges of sustainable development.

essential to assess the *comparative* efficiency of *practically possible* (feasible) and *alternative* forms of governance. Thus, the *additional benefits* (problems to be solved, risks to be overcome, new goals to be achieved), **and** the *costs*, **and** the *modes* for a new public intervention must be *socially admissible* (acceptable). If different forms permit achieving the *same goals*, tackling the *same problems*, overcoming the *same risks* etc., the analysis is to be focused on the selection of the mode *minimizing the total* (implementing *and* transacting) *costs*. Moreover, a form having the same (or less) costs as the alternatives is to be chosen if it provides *more benefits* or it is (socially, politically, technically) more *preferable* than other arrangements. If one of the possible forms provides *more benefits at the expense of more costs*, then the selection is to be made depending on whether the *additional costs* for that public intervention are *socially acceptable* (and feasible) or not. Similarly, if there is a *single* (only one) mode available for governing a particular intervention (achieving a certain sustainability goal) it would be introduced only if associated implementing *and* transacting costs are *socially admissible* (and feasible).

At this final stage, our comparative analysis let us *improve the design* of the new forms of public intervention according to the *specific* market, institutional and natural *environment* of a particular country, region, sub-sector³², and in terms of *perfection of the coordination, adaptation, information, stimulation, restriction of opportunism, controlling* (in short – minimization of transaction costs) of participating *actors* (decision-makers, implementers, beneficiaries, other stakeholders). What is more, it also unable us to *predict* likely cases of *new* public (local, national, international) *failures* due to impossibility to mobilize sufficient political support and necessary resources and/or ineffective implementation of otherwise “good” policies in the specific economic and institutional environment of a particular country, region, sub-sector etc. Since the public failure is a feasible option its timely *detection* permits foreseeing the persistence or rising of certain problems of agrarian sustainability, and *informing* (local, international) community about associated risks³³.

ENVIRONMENTAL GOVERNANCE IN BULGARIAN AGRICULTURE

Institutional environment

There has been a fundamental post-communist transformation of Bulgarian agriculture after 1989 [Bachev, 2006]. New private rights on major natural resources (farmland, forestry, water, origins) has been introduced or restored, markets and trade liberalized, and modern public support and regulations introduced.

During most of the transition diverse environmental rights (on clean and athletic nature; preservation of natural resources, biodiversity etc.) were not defined or were badly defined and enforced [Bachev, 2008]. Furthermore, inefficient public enforcement of laws and absolute and contracted rights has been common during transition now³⁴. Besides, out-dated system of public regulations and control dominated until recently which corresponded little to the contemporary needs of environmental management. Besides, there was no modern system for monitoring the state of soil, water, and air quality, and credible information on the extent of environmental degradation was not available. What is more, there existed neither social awareness of the

³² The effective institutions can not be “imported“ but must be designed for the specific conditions of different countries, regions, sectors etc. [North].

³³ For instance, most countries have declared a “green recovery strategy” for overcoming the current financial and economic crisis. However, only few of them actually take the appropriate measures and put needed resources in that direction.

³⁴ Requirements for fighting against corruption and reforming administration and juridical system have been underlined by the European Commission (EC) Monitoring Reports and closely scrutinized after EU accession.

“concept” of sustainable development nor any “needs” to be included in public policy and/or private and community agenda. The lack of culture and knowledge of sustainability has also impeded the evolution of voluntary measures, and private and collective actions (institutions) for effective environmental governance.

In the last few years before EU accession, country’s laws and standards were harmonized with the immense EU legislation³⁵. The Community Acquis have introduced a modern framework for the environmental governance including new rights (restrictions) on protection and improvement of environment, preservation of traditional varieties and breeds, biodiversity, animal welfare etc. However, a good part of these new “rules of the game” are not well-known or clearly understood by the various public authorities, private organizations and individuals [Bachev, 2008]. Generally, there is not enough readiness for an effective implementation of the new public order because of the lack of experience in agents, adequate administrative capacity, and/or practical possibility for enforcement of novel norms (lack of comprehension, deficient court system, widespread corruption etc.).

In many instances, the enforcement of environmental standards is difficult (practically impossible) since the costs for detection and penalizing of offenders are very high, or there is no direct links between the performance and the environmental impact. For example, although the burning of (stubble) fields has been banned for many years (2000 Law for Agricultural Land Protection) yet this harmful for the environment practice is still widespread in the country. Subsequently, a permanent deterioration of soil quality³⁶, wasting the accumulated through photosynthesis soil energy, an extermination of soil micro flora and other habitats, a significant contribution to green-house emissions³⁷, multiplying instances of forests fires, diminishing visibility and increasing traffic accidents, all they come out as a result [EEA].

The harmonization with the EU legislation and the emergence of environmental organizations also generate new conflicts between private, collective and public interests. However, the results of the public choices have not always been for the advantage of the effective environmental management. For instance, the strong lobbying efforts and profit-making interests of particular individuals and groups have led to 20% reduction in numbers and 50% reduction in area of initially identified sites for the pan European network for preservation of wild flora, fauna and birds NATURA 2000.

Private modes of governance

During much of the transition newly evolving market and private structures have not been efficient in dealing with various environmental issues.

The privatization of agricultural land and other non-land assets of ancient public farms took almost 10 years to complete³⁸. During a good part of that period, the governance of a critical agrarian resource was in ineffective and “temporary” structures (such as Privatization Boards, Liquidation Councils, Land Commissions etc.). Sales and long-term lease markets for farmland did not emerge until 2000, and leasing on an annual base was a major form for the extension of farm size until recently. That was combined with a high economic and institutional uncertainty,

³⁵ The Acquis Communautaire adapted before EU accession (January 1, 2007) contains 26000 pieces of legislation accounting for 80000 pages.

³⁶ Losses reach up to 80% of the organic carbon and nitrogen, and up to 50% of the remaining main nutrition elements in the soil [EEA].

³⁷ According to estimates they account for 5793 tons methane, 1883 tons carbon oxide, 4344879 tons carbon dioxide, and 3621 tons nitrogen oxide in 2006 [EEA].

³⁸ During the Communist period farming was carried in few large public farms (agro-industrial complexes, state and collective farms) averaging tens of thousands hectares and livestock heads. Besides, there were more than a 1.5 million small “personal plots“ (farms).

and a big inter-dependency of agrarian assets [Bachev, 2006]. Consequently, most of the farming activities have been carried out in less efficient and unsustainable structures such as part-time and subsistence farms, production cooperatives, and huge business farms based on provisional lease-in contracts (Table 1). Furthermore, market adjustment and intensifying competition has been associated with a significant decrease in number of unregistered farms (74%) and cooperatives (51%) since 1995.

Table 1: Number, size and importance of different type farms in Bulgaria

	Public farms	Unregistered	Cooperatives	Agro-firms	Total
Number of farms					
1989	2101	1600000	na	na	1602101
1995	1002	1772000	2623	2200	1777000
2000	232	755300	3125	2275	760700
2005		515300	1525	3704	520529
2007		458617	1281	5186	465084
Share in number (%)					
1989	0.13	99.9			100
1995		99.7	0.1	0.1	100
2000		99.3	0.4	0.3	100
2005		99.0	0.3	0.7	100
2007		98.6	0.3	1.1	100
Share in farmland (%)					
1989	89.9	10.1			100
1995	7.2	43.1	37.8	11.9	100
2000	1.7	19.4	60.6	18.4	100
2005		33.5	32.6	33.8	100
2007		32.2	24.7	43.1	100
Average size (ha)					
1989	2423.1	0.4			3.6
1995	338.3	1.3	800	300	2.8
2000	357.7	0.9	709.9	296.7	4.7
2005		1.8	584.1	249.4	5.2
2007		2.2	613.3	364.4	6.8

Source: National Statistical Institute and Ministry of Agriculture and Food

Table 2: Number and size of livestock holdings in Bulgaria (November 2007)

Type of holdings	Share		Share		Share		Share		Average heads
	farms	heads	farms	heads	farms	heads	farms	heads	
	<i>1-2</i>		<i>3-9</i>		<i>10-19</i>		<i>20 and ></i>		
Dairy cows	79.8	36.1	16	25.2	2.5	11.8	1.6	26.8	2.7
Buffalo cows	69.9	19	17.7	13	7.2	15.5	5.2	52.5	5.1
	<i>1-9</i>		<i>10-49</i>		<i>50-99</i>		<i>100 and ></i>		
Ewes	85	37.1	12	24.5	2	15	1	23.4	8.6
She-goats	97.1	75.3	2.7	17.4	0.2	4.1	0.1	3.2	2.8
	<i>1-2</i>		<i>3-9</i>		<i>10-199</i>		<i>200 and ></i>		
Breeding pigs	78.8	12.8	14.9	8.8	5.8	21.1	0.5	57.4	7.8

Source: MAF Agro-statistics

Post communist transformation has also seen a significant change in the governance of livestock activity. The specialized livestock farms comprise a tiny portion of all farms (Table 2) while 97% of the livestock holdings are miniature “unprofessional farms” breeding 96% of the goats, 86% of the sheep, 78% of the cattle, and 60% of the pigs in the country [MAF].

Dominating modes for carrying out farming activities have had little incentives for long-term investment to enhance productivity and environmental performance [Bachev, 2006]. The cooperative’s big membership makes individual and collective control on management very difficult (costly). That focuses managerial efforts on current indicators, and gives a great possibility for using coops in the best private (managers) interests. Besides, there are differences in the investment preferences of diverse coops members due to the non-tradable nature of the cooperative shares (“horizon problem”). Given the fact that most members are small shareholders, older in age, and non-permanent employees, the incentives for long-term investment for land improvement and renovation of material and biological assets have been very low. Last but not least important, the “member-oriented” (non-for-profit) nature of the cooperatives prevents them to adapt to diversified needs of members and market demand and competition.

On the other hand, small-scale and subsistent farms³⁹ possess insignificant internal capacity for investment, and small potential to explore economy of scale and scope (big fragmentation and inadequate scale). Besides, they have little incentives for non-productive (environment conservation, animal welfare etc.) investment. Moreover, there has been no state administrative capacity nor a political will to enforce the quality and eco-standards in that vast informal sector of the economy.

Likewise, the larger business farms operate mainly on leased land and concentrate on high pay-off investment with a short pay-back period (cereals, sunflower). That has been coupled with ineffective outside pressure (by authority, community) for respecting the official standards for ecology, land use (crop rotation, nutrition compensation), biodiversity etc. In general, survivor tactics and behavior rather than a long-term strategy toward farm sustainability has been common among the commercial farms.

Furthermore, during the entire transition the agrarian long-term credit market was practically blocked due to the big institutional and market uncertainty, and the high specificity of much of the farm investments [Bachev and Kagatsume]. In addition, newly evolving Bulgarian farming has been left as one of the least supported in Europe⁴⁰. Until 2000 the public aid was mainly in the form of preferential short-term credit for the grain producers and insignificant support to capital investments. That policy additionally contributed to the destructive impact for unbalanced unilateral N fertilization by the biggest producers having access to the programs. Despite the considerable progress in the public support since 2000 (EU Special Assistance Program for Agriculture and Rural Development - SAPARD, CAP measures) the overall support to agriculture is estimated very little [Bachev and Kagatsume]. In addition, only a small proportion of the farms benefits from some form of public assistance most of these farms being large enterprises from regions with less socio-economic and environmental problems. Basically, a publicly supported farm must meet the requirements for the good environmental performance. However, the minor amount of actually supported farms, and the deficiency of clear criteria for eco-performance, and the lack of effective control, have contributed barely to overall improvement of environmental situation.

Hence, since 1990 the entire “environmental management” has been left on the farmers “good will” and the “market signals”. Market governance (competition, marginal rule) has led to

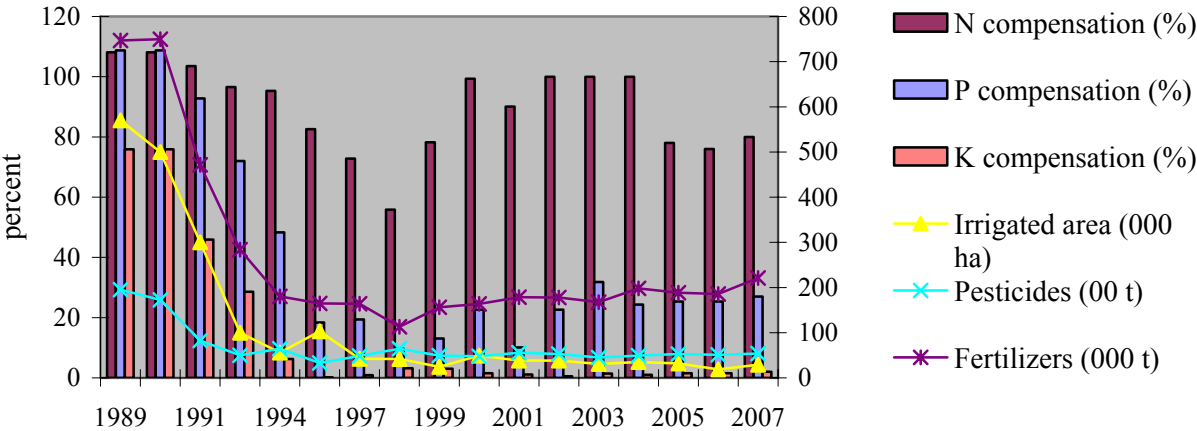
³⁹ Subsistence and semi-subsistence farms comprise the best part of the farms as almost 1 million Bulgarians are involved in farming mostly on a part-time base and for “supplementary” income [MAF].

⁴⁰ Estimates demonstrate that the Aggregate Level of Support to Agriculture before 2000 was very low, close to zero or even negative [OECD, 2000].

a sharp decline in all crop (but sunflower) and livestock (but goat) productions⁴¹. The smaller size and owner operating nature of the majority of farms avoided certain problems of the large public enterprises from the past such as lost natural landscape, biodiversity, nitrate and pesticide contamination, huge manure concentration, uncontrolled erosion etc. Subsistent and small-scale farming has also revived some traditional (and more sustainable) technologies, varieties and products. In additions, the private mode has introduced incentives and possibilities for an integral environmental management (including revival of eco- and cultural heritage, anti-pollution, esthetic, comfort etc. measures) profiting from the inter-dependent activities such as farming, fishing, agro-tourism and recreation, processing, trade etc. Last but not least, there are good examples for foreign direct investment in cereals, oil crops, and integrated with farming vine and food processing, which introduce modern (western) governance, technologies, and quality, labor and environmental standards.

A by-product from dominating “market and private governance” was a considerable desintensification of the agriculture, and an ease of the general environmental pressure and pollution comparing to the pre-reform level. For instance, the total amount of used chemical fertilizers and pesticides has declined considerably, and now their per hectare application represent merely 22% and 31% of 1989 level (Figure 6). That sharp reduction in chemical use has diminished drastically the risk of chemical contamination of soils, waters, and farm produce. Consequently, a good part of the farm production has got unintended “organic” character obtaining a good reputation for products with a high quality and safety.

Figure 6: Irrigation, chemical application, and rate of fertilizer compensation in Bulgarian agriculture



Source: National Statistical Institute and Ministry of Agriculture and Food

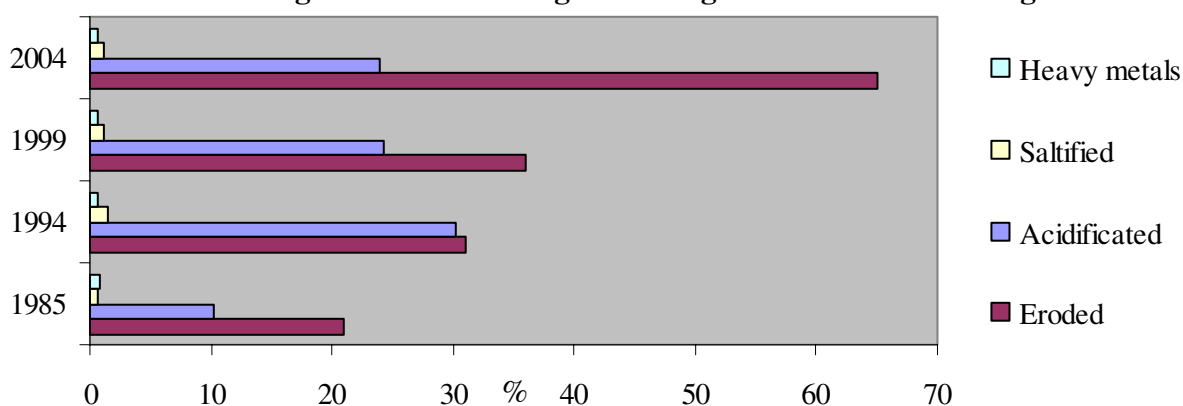
Nonetheless, a negative rate of fertilizer compensation of N, P and K intakes dominate being particularly low for phosphorus and potassium (Figure 6). Accordingly, an average of 23595,4 t N, 61033,3 t P₂O₅ and 184392 t K₂O have been irreversibly removed annually from soils since 1990 [MAF]. Furthermore, an unbalance of nutrient components has been typical with application of 5,3 times less phosphorus and 6,7 times less potassium with the appropriate rate for the nitrogen used during that period. Moreover, a monoculture or simple rotation has been constantly practiced by most large operators concentrating on few profitable crops (such as

⁴¹ For potatoes by 33%, wheat 50%, corn and burley 60%, tomatoes, Alfalfa hay and table grape 75%, apples 94%, pig meat 82%, cattle meat 77%, sheep and goat meat 72%, poultry meat 51%, cow milk 45%, sheep milk 66%, buffalo milk 59%, wool 85%, eggs 45%, honey 57% [NSI].

sunflower and wheat). All these practices further contributed to deterioration of soil quality and soil organic matter content.

There has been also a considerable increase in agricultural land affected by acidification (Figure 7). It has been a result of a long-term application of specific nitrate fertilizers⁴² and unbalanced fertilizer application without adequate input of phosphorus and potassium. Currently almost a quarter of soils are acidified as percentage of degraded farmland acidified soils reach 4,5% of total lands. After 1994 the percentage of acidified soil began to decrease, however, in recent years there is a reverse tendency along with the gradual augmentation of use of nitrates. During the entire period no effective measures have been taken to normalize soil acidity and salinity⁴³.

Figure 7: Share of degraded agricultural lands in Bulgaria



Source: Executive Environment Agency

Erosion has been another major factor for land degradation since 1990 (Figure 7). Due to ineffective management around one-third of the arable lands are subjected to wind erosion and 70% to water erosion as total losses varies from 0,2 to 40 t/ha in different years⁴⁴. The progressing level of erosion is a result of the extreme weather but it has been also adversely affected by dominant agro-techniques, deficiency of anti-erosion measures, and uncontrolled deforestation [EEA].

There has been also a sharp reduction of irrigated farmland as merely 2-5% of existing irrigation network⁴⁵ has been practically used (Figure 6). Consequently, irrigation impact on erosion and salinization has been significantly diminished. However, the decline in irrigation has had a direct negative effect on crop yields and structure of the crop rotation. In addition, irrigation has not been effectively used to counterbalance the adverse effect of global warming on farming (extension of farm season, increased water requirements, fall of rainfalls) and the further degradation of agricultural land.

There has been a significant reduction of overall green-house gas (GHG) emissions from agriculture as well (Figure 8). Moreover, the decline in the sector's contribution has been higher than the national. The N₂O emissions comprise 59% of the total emissions from agriculture and there is a slight enlargement of the share in last 5 years. Besides, agriculture has been a major

⁴² Consisting mostly of ammonium nitrate (70-80%) and carbamide (20-30%) [EEA].

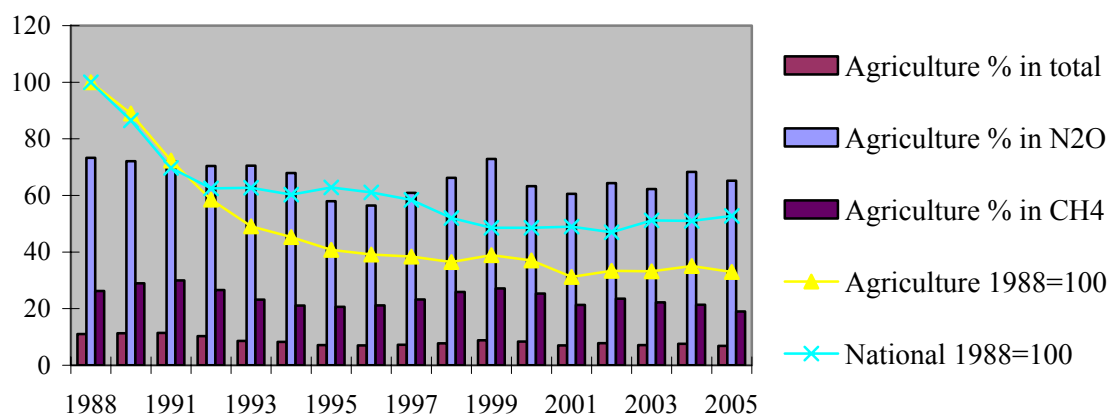
⁴³ For instance, limed acidificated lands comprises far below 2 % of the areas limed until 1990. And no chemical melioration or drainage of salinified land has been effectively implemented [MAF].

⁴⁴ Annual losses of earth masses from water erosion are estimated at 136 Mt while wind erosion deflates between 30-60 Mt. Two-third of the former and almost all of the later come from the arable land [EEA].

⁴⁵ Since 1990 a considerable physical distortion of irrigation facilities has also taken place affecting 80% of the internal canals [MAF].

ammonia source accounting for two-third of the national emission. After 2000, the majority of NO₂ emissions come from agricultural soils (87%), and manure management and burning of stubble fields (13%). The methane emission from agriculture represents about a quarter of the national. After 2000 the biggest portion of CH₄ comes from fermentation from domestic livestock (72%) and manure management (24%).

Figure 8: Trend and components of green-house gas emissions from Bulgarian agriculture



Source: Vassilev et al.

The new private management has led to an improved environmental stewardship on owned resources but has not extended to the nature in general (low appropriability of rights). It has been often associated with less concern to the manure and garbage management, over-exploitation of leased and common resources, and contamination of air and groundwater. For instance, the illegal garbage yards in rural areas have noticeably increased⁴⁶. Farms contribute extensively to waste “production” with both organic and industrial materials, leading not only to negative changes in the beauty of scenery but also bring about air, soil and water pollution. Pollution of soil and water from industrial activities, waste management, and improper farming activities still presents risk for the environment and human health⁴⁷. Data shows that in 7% of the tested soils, concentration of pollutants is higher than the contamination critical limits [EEA].

Furthermore, around a quarter of the riverlength does not meet the normal standards for good water quality [MAF]. Monitoring of water for irrigation shows that in 45% of water samples, the nitrates concentration exceeds the contamination limit value by 2 to 20 folds [MAF]. Nitrates are also the most common polluter of underground water for the last 5 years⁴⁸ with a slight excess over the ecological limit [EEA]. In addition, there has been reported general levels of pollutants exceeding the ecological limit value for triasine pesticides in underground water which is a consequence of the increased use of these chemicals.

The lack of effective manure storage capacities and sewer systems in majority of farms contribute significantly to the persistence of the problem. A major part of the post-communist livestock activity is carried out by a great number of small and primitive holdings often located within village and town borders. Merely 0,1% of the livestock farms possess safe manure-pile sites, around 81% of them use primitive dunghills, and 116 thousands holdings have no facilities

⁴⁶ The official figure for major illegal garbage locations is 4000 [EEA]. The actual figure is far bigger than the official one.

⁴⁷ Areas of agricultural land industrially polluted by heavy metals have fallen after 1990, they are not significant, and only about 30% of the affected soils need special monitoring [EEA].

⁴⁸ Nitrate Vulnerable Zones cover 60% of country’s territory and less than 7% of agricultural land use.

at all [MAF]. All that contributes significantly to pollution of air, water and soils, and disturbing population comfort (unpleasant noise and odor, dirty roads etc.).

There have been also significant degrading impacts of agriculture on biodiversity. According to the official data all 37 typical animal breeds have been endangered during the last several decades⁴⁹ as 6 among them are irreversibly extinct, 12 are almost extinct, 16 are endangered and 3 are potentially endangered [MEW]. Since 1990 a considerable portion of agricultural lands have been left uncultivated for a long period of time or entirely abandoned⁵⁰. The later has caused uncontrolled “development” of species allowing development of some of them and suppressing others. Besides, some of the most valuable ecosystems (such as permanent natural and semi-natural grassland) have been severely damaged⁵¹. Part of the meadows has been left under-grazed or under mowed, and intrusion of shrubs and trees into the grassland took places. Some of fertile semi-natural grasslands have been converted to cultivation of crops, vineyards or orchards. This has resulted in irreversible disappearance of plant species diversity. Meanwhile, certain public (municipal, state) pastures have been degraded by the unsustainable use (over-grazing) by private and domestic animals. In addition, a reckless collection of some valuable wild plants (berries, herbs, flowers) and animals (snail, snakes, fish) have led to destruction of all natural habitats. Above and beyond, some genetically modified crops have been introduced without an independent assessment of possible hazards for traditional and organic production and human health, or providing appropriate safeguards and proper information.

Market modes

A market driven organic farming has emerged in recent years in the country (Figure 9). It is a fast growing approach but it is restricted to 432 farms, processors and traders, and covers less than 3% of the Utilized Agricultural Area [MAF]. There are only few livestock farms and apiaries certified for bio-production. In addition, 242677 ha have been approved for gathering wild organic fruits and herbs. The organic form has been introduced by business entrepreneurs who managed to organize and fund this new venture arranging needed independent certification⁵² and finding potential buyers for the highly specific output. Produced bio fruits, vegetables, essential oil plants, herbs, spices, and honey are entirely for export since only a tiny internal market for organic products exists in the country.

The slow development of organic market is not only because of the higher prices of organic products but also because of the limited consumer confidence in the authentic character of products and certification⁵³. In addition, eco-labeling of processed farm products (relying on self-regulation) have appeared which has been more a part of the marketing strategy of certain companies rather than a genuine action for environmental improvement.

⁴⁹ The policy toward intensification and introduction of foreign varieties and breeds during communist period, and the lack of any policy toward protection of biodiversity afterwards have largely contributed to degradation of the rich diversity of local plants and animal breeds.

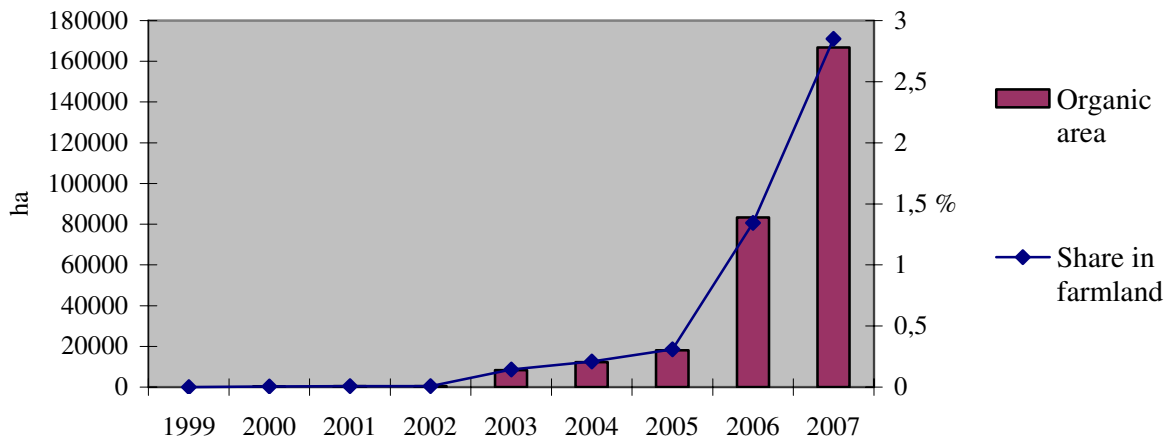
⁵⁰ Currently, almost 10% of all agricultural lands is unutilized farmland. In addition, fallow land accounts for 9,5% of arable land. In some years of transition abandoned land reached a third of total agricultural land [MAF].

⁵¹ Approximately 20% of the agricultural lands of Bulgaria are lands of High Nature Value [MAF].

⁵² A good part of the certification has been done by foreign bodies since until recently no Bulgarian certification institutions existed.

⁵³ Numerous fake labeling as organic or traditional products have been detected by the Organization for Consumer Protection and reported daily in media.

Figure 9: Development of organic farming in Bulgaria



Source: Ministry of Agriculture and Food

Since 2001 the assets of public owned irrigation companies were transferred to the newly evolving Water Users Associations. However, expected “boom” in efficiency (quantity, productivity) from a collective management of irrigation activities have not been materialized. That is because of the semi-monopoly situation of regional state water suppliers (monopoly terms and pricing), little water-users incentives to innovate facilities and expand irrigation, and still uncompleted privatization of state irrigation assets.

Generally, an initiation, development and maintenance of an organization of large group is very costly, and such a coalition is not sustainable for a long time (“free rider” problem). In Bulgaria, the evolution of farmers and environmental associations has been additional hampered by the big number of rural agents and their diversified interests (size of ownership and operation, type of farming, individual preferences, different age and horizon etc.) [Bachev, 2006].

Public modes

Market and private sector have failed to govern effectively the environment related activities in agriculture and there has been a need for a third-party public intervention. However, the Government and local authority involvement has not been significant, comprehensive, sustainable, or even related to the matter [Bachev, 2008]. The total budget of the Ministry of Water and Environment accounts for just 1,5% of the National Budget, and the agricultural sector gets a tiny portion of all public eco-spending [MWE]. Similarly, recultivation of degraded farmlands by the MAF has been under way recently but it accounts for merely 200-250 ha per year [MAF].

In the passed several years a number of programs have been developed to deal with the specific environmental challenges⁵⁴. In addition, national monitoring systems of environment and biodiversity have been set up and a mandatory ecological assessment of public programs introduced. Nevertheless, the actual eco-policies rest fragmented and largely reactive to urgent environmental problems (natural disasters such floods, storms, drought) rather that based on a

⁵⁴ National Strategy for Preservation of Biodiversity (1999); National Strategy for Environment (2000); National Plan for Agrarian and Rural Development (2000); National Programme for Limitation of Total Emissions of Sulphur Dioxide, VOC, and Ammonia (2002); National Program for Waste Management Activities (2002); Environmental Strategy for the Instruments of ISPA (2003), National Strategy for Management and Development of Water Sector (2004); Strategy for Developing Organic Agriculture (2005); National Plan for Agrarian and Rural Development (2007) etc.

long-term strategy for sustainable development. Moreover, there is no efficient coordination between different programs and management levels. The programs and action plans are usually developed and executed in a highly centralized manner (by bureaucrats, foreign experts, and profit-making companies) without involvement of independent local experts, stakeholders and public at large. In addition, there is considerable deficiency in administrative capacity at local level in terms of staff, qualification, material and financial means. As a result of all of these, inefficiency in priority setting and management (incompetence, corruption), and a minor impact of the public programs prevails [Bachev, 2008].

Moreover, a multifunctional role of farming has not been effectively recognized; and proper system for its assessment (data, indicators) introduced; and provision of a public service “environmental preservation and improvement” funded by the society. For instance, a measure “Agro-ecology” of the SAPARD was not approved until the middle of 2006 and a few projects have been funded since 2007⁵⁵.

Neither, the essential public institutions and infrastructure crucial for the sustainable farming development have been built: public system for enforcement of laws, regulations, and contracts does not work well; essential property rights (on environmental resources and biodiversity, special and organic products, GM products and intellectual agrarian property) are not well defined and/or properly enforced; public support programs are rarely governed effectively and in the best interest of the legitimate beneficiaries; agricultural research is underfunded and can hardly perform its function for innovation and independent expertise; newly established agricultural advisory system does not serve the majority of farms and include rural development and environmental issues; urgently needed public system for agrarian insurance has not been introduced; crucial agrarian and rural infrastructure (wholesale markets, irrigation, roads, communications) has not been modernized; public support for initiating and developing farming associations has not been given etc.

A serious environmental challenge is still caused by the state deficiency in storing and disposal of the out-of-dated or prohibited pesticides of the ancient public farms. Currently those chemicals account for 11079 t and a good proportion of them are not stored in safe places. There are registered 477 abandoned storehouses for such pesticides, situating in 460 locations around the country, and just 38% of them are guarded [EEA]. What is more, as much as 82% of all polluted localities in the country are associated with these dangerous chemicals, and only a tiny portion of them have gone through the entire cycle of examination.

A great number of international assistance projects (funded by the UN agencies, EU, Foreign Governments, NGOs etc.) have been carried out to “fill the gap” of the national government failures. They either focus on a specific issue (sustainable agriculture, desertification etc.) or mobilize local actors for sustainable development. These programs introduce western experiences in governance and try to make a difference. However, they are limited in scale and unsustainable in time; in some cases overtaken by the local groups and funding improperly used; and above all with no significant impact. The endurance of environmental and other challenges demonstrates that an effective system of governance has not been put in place. Subsequently, the modernization of Bulgarian farms according to the EU (quality, safety, environmental, animal welfare etc.) standards has been delayed; and growth in farms productivity, competitiveness and sustainability severely restricted; and technological, income and eco-disparity between farms of different type, sub-sectors and regions broadened [Bachev and Kagatsume].

⁵⁵ Due to the mismanagement and corruption SAPARD was suspended by the EC in 2008, and a considerable EU funding under that scheme lost.

Environmental governance in conditions of EU CAP implementation

The EU integration and CAP implementation provides new opportunities for Bulgarian farms. The EU funding alone, which agriculture receives from 2007 on is 5,1 times higher than the overall level of support to farming before acceding⁵⁶. Besides, the EU accession introduces and enforces a “new order” - strict regulations and control; tough quality, food safety, environmental etc. standards; financial support and protection against market instability etc. The external monitoring, pressure and likely sanctions by the EU leads to better enforcement of laws and standards in the country. For instance, in 2007 the EC started a procedure for sanctions for not reducing emissions of greenhouse gasses according to the EU Program for Environment and Combating Adverse Climate Changes. In 2008 EC blocked payments for SAPARD and other programs because of a considerable mismanagement and corruption.

Furthermore, huge EU markets is opened which enhances competition and let Bulgarian farms explore their comparative advantages (low costs; high quality, specificity and purity of produce). The novel conditions of market competition and institutional restrictions also give strong incentives (pressure) for new investments for increasing productivity and conforming to higher product, technology and environmental standards.

The larger and business farms are most sensitive to new market demand and institutional regulations since they largely benefit (or lose) from timely adaptation to new environmental regulations. Besides they have higher capacity to generate resources and find outside (credit, equity, public) funding to increase competitiveness and meet new institutional requirements [Bachev, 2006]. The process of adaptation has been associated with appropriate land management and the intensification of production. The later could revive or deepen some of the environmental problems (erosion, acidification, pollution) unless pro-environmental governance (public order, regulation etc.) is put in place to prevent that from occurring.

On the other hand, small-scale producers and most livestock farms are having a hard time adapting to new competition pressure, investment needs, and new food safety, environmental, animal-welfare etc. standards [Bachev and Nanseki]. Dairy farming is particularly vulnerable, since, only 1,4% of the holdings with 17% of the cows in the country meet EU quality, hygiene, veterinary and building standards [MAF].

A part of the farms is qualified to receive “area based” direct payments from EU. In view of the current (low) level of support, the direct payments augment farm sustainability and give means for adaptation to the new standards. On the other hand, this mode support less productive structures (smaller-scale, part-time, cooperative farms) and non-market forms (subsistence, cooperative farming). As a result, sustainability of these farms will increase – small-scale operations become viable; cooperatives are able to pay rent; subsistence farming become more profitable etc. Furthermore, direct payments cause an increase of farmland price and rent, and thus enlarge costs for land supply in the largest farms. In contrast, smaller-scale operators retain entire subsidies and see their income increased. Subsequently, the transformation of land management to the most effective forms and restructuring of farms is further delayed⁵⁷.

However, the EU support benefit unevenly different farms as the bulk of the public subsidies actually go to few farms - the larger operators (agri-firms and cooperatives) specialized in field crops. At the same time, many effective small-scale farms and livestock farms⁵⁸ receive no or only a tiny fraction of the direct payments. For instance, in 2008 less than 16% of all farms

⁵⁶ For 2007-2009 the EU funds allocated for “agrarian and rural development“ are €733 million, for “direct payments“ 722 million, and for “market support“ €388 million. Besides, Bulgarian agriculture receives funding from the EU Structural Funds and the national budget.

⁵⁷ In some instances (subsistence and semi-subsistent farms, member oriented cooperatives), EU funds is used effectively to subsidize food self-supply of population.

⁵⁸ Livestock farms are not eligible to receive any direct payments under the “area based scheme”.

got area based payments averaging 2226,1 Euro per farm and 50,4 Euro per ha [MAF]. In addition, around 13% of the farms received national top-ups averaging 910 Euro per farm and 203,3 Euro per ha. Typically, the same farms touch both types of payments as farms specialized in field crops get the largest public support (Table 3). Furthermore, the most of the subsidies go to the more developed regions where the biggest farms and utilized farmland are located. That further fosters the disparity in income and efficiency among different farms and sub-sectors.

Table 3: Share of EU and national support in Net Income of different Bulgarian farms in 2008 (percent)

Type of farm	Share of subsidies in farms Net Income	
	<i>Current subsidies</i>	<i>Investment subsidies</i>
Field crops	63.2	2.1
Horticulture	1.3	1.8
Permanent crops	0.4	2.2
Livestock	0.3	0

Source: MAF Agro-statistics

There are also significant EU funds for rural development exceeding 4,7 times the relevant pre-accession level. This amount of resources let more and relatively smaller farms to get access to public support scheme and invest in modernization of enterprises. Furthermore, new essential activities are effectively funded such as: commercialization and diversification of farming; introduction of organic farming; maintaining productivity, biodiversity; agri-environment of protection, animal welfare; support for less-favored areas and regions with environmental restrictions etc. All these would help bringing additional employment and income for farmers, and increasing economic and environmental sustainability of farms.

Similarly to the past⁵⁹, mostly bigger farms participate in public support programs because they have a superior managerial and entrepreneurial experience, available resources, possibilities for adaptation to new requirements for quality and other standards, potential for preparing and winning projects etc Besides, despite the strong EU (and internal pressure) it has been impossible to reform the inefficient system of governance of public programs. Consequently, a significant EU funding has been blocked while other support (such as SAPARD) irreversibly lost. Therefore, agrarian and rural development funds will probably continue to benefit exclusively the largest structures and the richest regions of the country; and more abuses will take place; and CAP support will not contribute to decreasing economic and eco discrepancy between farms, sectors, and regions.

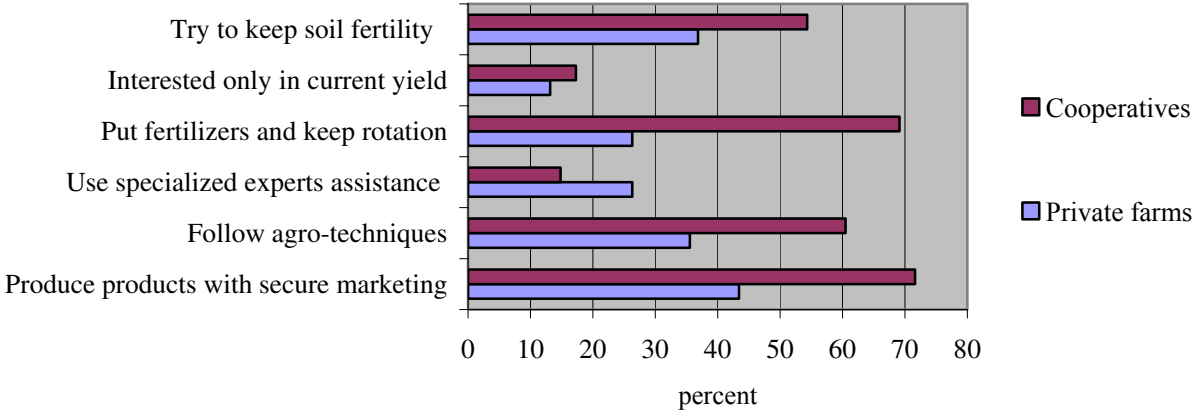
The CAP implementation improve the environmental performance of commercial farms. There is a mandatory requirement for farms to “keep the farmland in a good agricultural and environmental status” in order to receive direct payments and participate in public programs. Moreover, direct payments induce farming on previously abandoned lands, and improve environmental situation and biodiversity. Furthermore, there is a huge budget allocated for special

⁵⁹ SAPARD and other public programs benefited predominately large farms, cooperatives and agri-firms [Bachev and Kagatsume]. Likewise, in 2008 the biggest part of funded projects under measure “Modernisation of farms“ of Agrarian and Rural Development Program were for agro-firms (57%) and cooperatives (15%) [MAF].

environmental measures (going beyond the “good farming practices”)⁶⁰. Therefore, a number of farms taking part in various agri-environmental programs will gradually increase in future⁶¹.

Our recent survey has found out that for most farms the “economic” sustainability (“concentration on products with secure marketing”) is still the dominant strategy (Figure 10). At the same time, a good portion of cooperatives and most part of non-cooperative farms do not implement long-term strategies for keeping ecological sustainability through preserving soil fertility, observing crop rotation and agro-techniques requirements etc.

Figure 10: Share of Bulgarian farms implementing different production strategies (%)



Source: Survey data

The CAP measures would affect positively the environmental performance of large business farms and cooperatives. Namely these enterprises (and potential big polluters) are under constant administrative control and severe punishment (fines, losing licenses, and ceasing activities) for obeying new environment and animal welfare standards. Therefore, they are strongly interested in transforming their activities according to the new eco-norms making necessary eco-investments, changing production structures etc. Moreover, larger producers are motivated to participate in special agro-environmental and biodiversity programs, since they have lower costs (potential for exploring economies of scale and scope) and higher benefits from such long-term public contracts.

The experience of other EU countries demonstrates that some of the terms of the specific contracts for environment and biodiversity preservation, animal welfare, keeping tradition etc, all they are very difficult (expensive) to enforce and dispute. In Bulgaria the rate of compliance with these standards would be even lower because of the lack of readiness and awareness, insufficient control, ineffective court system, domination of “personal” relations and bribes etc. Correspondingly, more farms than otherwise would enroll will participate in such schemes (including the biggest polluters and offenders). Subsequently, the outcome of implementation of that sort of instruments would be less than the desirable (“European”) level.

More to the point, direct costs and lost income for conforming to the requirements of the special programs in different farms vary considerably, and they have unequal incentives to participate. Having in mind the voluntary character of the most CAP support instruments, we should expect that the biggest producers of negative impacts (large polluters and non-compliant

⁶⁰ The National Plan for Agrarian and Rural Development (2007-2013) allocates budget for “preservation of national resources and improvement of countryside” amounting € 623.3 million (27,1% of the total funding).

⁶¹ In 2008 there are only 27079 approved projects supporting farms from “unfavarable“ regioms [MAF].

with modern quality, agronomic, biodiversity, animal welfare etc. standards) would stay outside of these schemes since they have the highest environment enhancement costs. On the other hand, small contributors would like to join since they do not command great efforts (and additional costs) comparing to the supplementary net benefit. Moreover, the Government is less likely to set up high performance standards because of the perceived “insignificant” environmental challenges, the strong internal political pressure from farmers, and the possible external problems with the EU control (and sanctions) on cross-compliance. Therefore, CAP implementation will probably have a modest positive impact on the environment performance of Bulgarian farms.

The public support and new public demand give a push to further development of market modes such as organic farming, industry driven eco-initiatives (eco-labeling, standards, professional codes of behavior), protected high quality products⁶², system of fair-trade, production of alternative (wind, manure) energy at farm etc. For instance, the significant EU market and lower local costs create strong incentives for investment in organic and specific productions by the large enterprises - farms, partnerships and joint ventures (including with non-agrarian and foreign participants). Similarly, new incentives for production of bio-fuel and clean energy would induce development of a new area of farm activity (new sub-sectors) associated with that new public and market demand.

Principally, the small farms have less capacity to put together or find necessary capital and expertise for initiating, developing, certifying and marketing in all these new venture. Besides, the coalition (development, management, and exit) costs between small-scale producers are extremely high to reach the effective operation level (allowing exploring technological economies of scale and scope or technologically required minimum of inputs). Therefore, the later either stay out of these new businesses or have to integrate into larger or non-farm ventures. However, assuring the effective traceability of the origin and quality for small farms is very costly and they are not preferable partner for integrators (processor, retailers, and exporters). What is more, the internal market for organic and specialized farm products would unlikely develop fast having in mind the low income of population and the lack of confidence in public and private system of control.

Some economic and/or ecological needs (such as economizing on scale and scope or high interdependency of assets) would continue to bring about a change in size and governance of individual farms and/or evolution of group organization, cooperation, and joint ventures. For instance, a big interdependency of activities require concerted actions for achieving certain eco-effect; a high asset dependency between livestock manure (over) supplier and nearby (manure demanding) organic crop farms necessitate a coordination etc.

A special governing size and/or mode is also imposed by some of the institutional requirements. For example, a mandatory minimum scale of activities is set for taking part in certain public programs (e.g. marketing, agri-ecology, biodiversity, organic farming, tradition and cultural heritage); signing a 5 year public environmental contract dictate a long-term lease or purchase of managed land etc. Our recent survey has proved that as much as 41% of the non-cooperative farms and 32% of the cooperatives are in the middle of investigation of possible membership in a professional organization. Producers grouping are further stimulated by the available new public support (training, advising, funding) for farmers association.

Some of the existing production cooperatives would also profit from their comparative advantages (interdependency and complementarily to individual farms, potential for exploring economy of scale and scope on institutionally determined investment, adapting to formal requirements for support, using expertise, financing and executing projects, non-for-profit character etc.), and extend their activities into eco-projects, environmental services, eco-mediation between members etc.

⁶² Such as Protected Designation of Origin, Protected Geographical Indication, and Traditional Specialty Guaranteed.

Thus an immediate result of the new market and public opportunities for getting additional benefits (income, profit) from environmental products and services will be an amelioration of the economic performance and overall sustainability of a number of farms and rural households.

The CAP implementation will push modernization of farms structures through widening the variety of contractual and organizational innovations - specific sort of contracts, new types of producers associations, spreading vertically-integrated modes etc. Special forms are also emerging, allowing agents to take advantage of large public programs which specialize in project preparation, management, and execution; invest in “relations capital” or “negative” entrepreneurship; form modes for lobbying and representation; make coalitions for complying with formal criteria (e.g. minimum size of utilized agricultural area for direct payments, membership requirements for producers’ organizations) etc.

CAP measures and enhanced competition foster the restructuring of commercial farms according to modern market, technological, and institutional standards. A large part of agrarian inputs, technologies, and outputs is increasingly having a “mass” (standardized) character, and market transacting dominate at farm gates. There is also a parallel tendency toward specialization into productions for “niche markets” and products with special quality - specific origins, special technologies, special quality etc. All that requires investments with higher specificity to a particular buyer(s), and “integrated” management of activity in farming, processing, retailing and exporting [Bachev, 2006]. Besides, some diversification of enterprises into related activities (trade with origins, agro-tourism) for dealing with market risk is to grow. All these bring more new, special modes for private governance such as long-term contracts, collective agreements (codes of professional behavior), trilateral modes (independent third-party certification/control), “quasi” or complete integration.

In the new market and institutional environment many livestock farms are less sustainable because of the low productivity and competitiveness, and non compliance with the EU quality, hygiene, animal welfare and eco-standards. That is particularly truth for the small-scale unregistered producers which dominate the sector (Table 4). What is more, only a third of dairy holdings believe their production capacity corresponds to the modern requirements of competition, productivity, and justification of improvement of environmental performance and animal welfare. Nevertheless, merely one-seventh of dairy farms have potential (internal capacity, access to outside sources) to fund necessary investment associated with the adaptation to new norms and standards.

Table 4: Share of farms with big and good capacity for adaptation to EU requirements for dairy sector (per cent)

Farms capacity	Unregistered	Firms	Coops	Total
Extend of knowledge on new requirements	22.7	63.6	100	38.2
Available skills and knowledge for adaptation	22.7	54.5	100	35.3
Available production capacity	27.3	45.4		32.3
Improvement of quality and hygiene standards	36.4	72.7	100	50.0
Improving animal welfare	31.8	72.7		44.1
Improving environmental performance	31.8	54.5		38.2
Finding necessary investment	9.1	27.3		14.7

Source: survey data

Our survey of dairy farms has found out that the greatest part of unregistered farms believes that CAP measures would have a “neutral impact“ on their income, volume and technology of production, investment level, product quality, access to public programs, improvement of environmental care, improvement of animal welfare, development of infrastructure, possibilities for new income generation, and social status of farm households (Table 5). A bulk of firms

expects a “positive“ effect in all above directions while cooperatives are optimistic for improvement of animal welfare and pessimistic for the impact on income and access to public programs.

Table 5: Expectation for impact of EU CAP implementation on your farm (% of farms)

Impact on:	Unregistered		Firms		Total	
	+	-	+	-	+	-
Volume of production	22.7	9.1	36.4	27.3	26.5	14.7
Income of farm	22.7	9.1	45.4	18.2	29.4	14.7
Technology of production	13.6	4.5	54.5	9.1	26.5	5.9
Investment	18.2	4.5	45.4	18.2	26.5	8.8
Products quality	18.2	0	45.4	0	26.5	0
Access to public programs	9.1	4.5	54.5	9.1	23.5	8.8
Improvement of animals care	13.6	0	45.4	9.1	26.5	2.9
Improvement of care for environment	9.1	0	54.5	9.1	23.5	2.9
Development of infrastructure	9.1	0	54.5	9.1	23.5	2.9
Opportunities for new income	18.2	9.1	36.4	9.1	23.5	8.8
Social status of your household	13.6	4.5	45.4	27.3	23.5	11.8

Source: survey data (+) - positive impact; (-) - negative impact

A few livestock farms will be able to adapt through specialized investment for enlargement and conforming to the new institutional restrictions by the deadline for full compliance in the end of 2009. Meanwhile, the EU and public pressure for enforcement of standards in commercial sector increases and leads to closure or take-over of a greater part of livestock farms. The related reduction of farms and animals, and improved manure management, is associated with a drop of the environmental burden by the formal sector (less over-grazing, fewer manure production and mismanagement etc.).

We estimated that few subsistence farms would undertake market orientation and extend their present scale because of the high costs for farm enlargement and adjustment - no entrepreneurial capital and resources available, low investment and training capability of aged farmers, and insufficient demand for farm products [Bachev, 2006]. Newly introduced specific support to “semi-market” farms would have no considerable impact on subsistency because of the inappropriate criteria⁶³ and the insufficient level of support. Besides, this measure focus on less prospective structures (small semi subsistence holdings) with low potential for adaptation to volume, quality, safety, animal welfare and environmental requirements, and needs of processors and distributors. On the other hand, for the authority is practically (technically, politically) impossible to enforce the official standards in that huge informal sector of the economy. Therefore, massive (semi) subsistence farming with primitive technologies, poor food safety, environmental and animal welfare standards will continue to exist in years to come.

We have already demonstrated that, the hybrid modes (public-private; public-collective) are much more efficient than the pure public forms given the coordination, incentives, and control advantages. Moreover, enforcement of most labor, animal welfare, biodiversity etc. standards is very difficult or impossible at all. That is particularly truth for the huge informal sector of the

⁶³ The same criteria (as in other EU countries) for defining “semi-market farms” is used – farms with size of 1-4 European Size Units (1ESU=1200 Euro). However, for the Bulgarian conditions an income within this range is quite big (above the average for agriculture and other sector of the economy) to be considered as “semi-market” activity.

economy. Here individual “punishments” do not work well while overall damages from the incompliance are immense. That is why policies should be oriented to market orientation of subsistence farms, support and incentives for collective modes, and eco-programs for informal farms and groups. Principally, public support to voluntary environmental initiatives of farmers and rural organizations (informing, training, assisting, funding) would be much more effective than mandatory public modes in terms of incentive, coordination, enforcement, and disputing costs. Furthermore, involvement of farmers, farmers organizations, and interests groups in priority setting and management of public programs at different level is to be institutionalized in order to decrease information asymmetry and possibility for opportunism, diminish costs for coordination, implementation and control, and increase overall efficiency and impact.

All surveys show that many of the specific EU regulations are not well known by the implementing authorities and majority of farmers [Bachev, 2008]. What is more, our recent survey indicates that as much as 47% of non-cooperative farms and 43% of cooperatives are still “not aware or only partially aware” with the support measures of CAP different from the direct payments. Furthermore, as much as 62% of the farms report that they will not apply for such support due to the “lack of financial resources” (26%), “not compliance with formal requirements” (18%), and “clumsy bureaucratic procedure” (17%).

In addition, there are still a number of “blank points” in adaptation of EU regulations in Bulgarian agriculture. For instance, “the whole farm” is a subject of support in agri-environmental measures (e.g. organic farming) but its borders are not defined at all in the national legislation. That creates serious difficulties since land and other resources of the majority of farms are considerably fragmented and geographical dispersed.

Above and beyond, most of the farm managers have no adequate training and managerial capability, and are old in age with a small learning and adaptation potential. For instance, the average age of the farm managers is 61 as 70% of them are older than 55 [MAF].

The lack of readiness, experiences, and potential for adaptation in public and private sectors alike would require some time lag until the “full” implementation of the CAP in “Bulgarian” conditions. The later will depend on the pace of building an effective public and private capacity, and training of (acquiring learning by doing experience by) bureaucrats, farmers, and other agrarian agents. As a consequence of the internal and external for farms factors farms modernization and adaptation will be delayed, and their competitiveness and sustainability diminished. Moreover, there will be significant inequalities in application (and enforcement) of new laws and standards in diverse regions of the country and sectors of agriculture, and farms of different type and size.

Last but not least important, there is a growing competition for environmental resources between different industries and interests. That push further overtaking the natural resources away from the farm governance and change into non-agricultural (urban, tourism, transport, industry etc.) use. The needs to compete for and share resources would deepen conflicts between various interests and social groups, regions, and even with neighboring states. All that would require a special governance (cooperation, public order, hybrid form) at local, national and transnational scales to reconcile conflicts in the benefit of an effective environmental management.

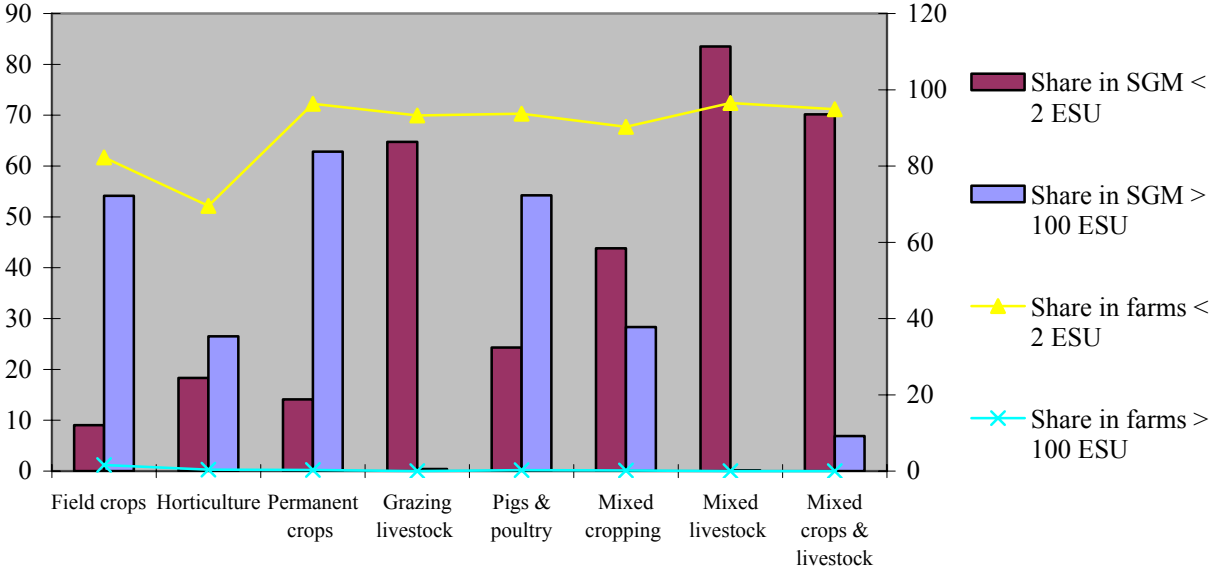
Sustainability of farm structures

The last stage of analysis is to assess the sustainability of different type of farming organization.

Large business farms govern a significant part of the activity in cereals, industrial crops, permanent crops, poultry and pigs. Most of them are registered as some type of agro-firms - Sole Traders (58,3%), Companies (35,4%), and Associations (6,3%). Big farms account for a tiny

portion of all farms, but concentrate a significant part of UAA (Table 1) and produce the bulk of the Standard Gross Margin (SGM) in major sub-sectors (Figure 11).

Figure 11: Share of farms with SGM smaller than 2 ESU and bigger than 100 ESU in total SGM and farms with different specialization (percent)



Source: Ministry of Agriculture and Food

Business farms are commonly large specialized enterprises. Most of them were set up as family and partnership organization during first years of transition by younger generation entrepreneurs. Specific management skills and “social” status, and a combination of partnership assets (technological knowledge, business and other ties, available resources) led to the rapid extension of farms through an enormous concentration of (management, ownership of) resources, exploration of economy of scale and size, and modernization of enterprises [Bachev, 2006]. During the long period of institutional and market transformation (unsettled rights on resources, imperfect regulations, huge uncertainty and instability) the personal relations and “quasi” or entirely integrated modes were extensively used to overcome transaction difficulties. In addition, some state companies were taken over by managers and registered as shareholdings. Joint ventures with non-agrarian and foreign capital have been increasingly set up as well. Business farms have been constantly extending their share in managed agrarian (and related) resources and output taking over smaller farms, incorporating new types of activities and applying new organizational schemes.

Business farms are profit-oriented organizations, and farmer(s) have great incentives to invest in farm-specific (human, material, intangible) capital because they are the sole owners of residual rights (benefits) of the farm. Owners are family members or close partners, and the internal transaction costs for coordination, decision-making, and motivation are not high. Increased number of coalition (partnership) gives additional opportunity for internal division of labor and profiting from specialization (e.g. full-time engagement in production management, market relations, paper work, technological development etc.).

The organizational style of a firm is more and more preferred since it provides the opportunity to overcome coalition difficulties (e.g. forming joint ventures with outside capital, disputed ownership rights through the court system); to diversify into farm related or independent businesses (trade, agro-tourism, processing); to develop firm-specific intangible capital (advertisement, brand names, public confidence) and its extension into a daughter company, trade

(sell, licensing), and transfer through generations (inheriting); to overcome existing institutional restrictions (e.g. for direct foreign investments in farmland and engaging in trade with cereals, vine, dairy); to provide explicit rights for taking part in particular types of transactions (such as export licensing, privatization deals, assistance programs etc.).

Their large size and reputation make business farms preferable partners in inputs supply and marketing deals. Besides, business farms have giant negotiating power and effective economic and political mechanisms to enforce contracts. They also possess great potential to collect market information, search for the best partners, use experts and innovation, meet special (collateral) requirements and bear the risk and costs of failures. Large farms have strong incentives and potential for innovation – available resources to test, adapt, buy, and introduce new methods, technologies, varieties; possibility to hire leading experts and arrange direct supply from consulting companies or research institutes. In addition, they could explore economy of scale and scope on production and management (e.g. “package” arrangement of credits for many projects and interlinking inputs supply with know-how supply, crediting and marketing). They are also able to invest considerable relation-specific capital (information, expertise, reputation, lobbying, bribing) for dealing with funding institutions, agrarian bureaucracy, and market agents at national or even international scale. Furthermore, they have enormous political power to lobby for Government support in their best interests. All these give considerable advantages of business type farming organization.

Under the conditions of non-working court and contract enforcement systems, all critical transactions are governed (controlled, protected) through internal modes. Farm-specific assets such as critical machinery, vineyards, orchards, animals, processing facilities, and adjoining land, are all safeguarded by ownership. Low cost standard (one-season, share rent) lease-in contracts are widely used to govern land supply from tens and hundreds of proprietors. Critical transactions are integrated through extensive labor employment. Besides, core labor (specialists, mechanists) is hired on a permanent basis and special forms such as output-based compensation, interlinking (housing, services), social disbursements, paid holidays etc, are further used to enhance motivation.

Own supply (making) rather than outside procurement is typical for the essential services and inputs which prevents risk from unilateral dependency (opportunism of supplier) or missing market situation. In the case of high asset interdependency (product specificity; quality and quantity dependency) with a downstream partner’s reciprocal supply of inputs against marketing is applied.

Funding is secured through an effective combination of equity, debt, public and hybrid modes. Standard activities and assets are financed by bank credit since it is easy to arrange a loan. Alternatively, farm-specific investments are financed through private modes - own sources, “personal” loans and co-investment. Also, special contract modes are used to mitigate funding difficulties (e.g. shortage of working capital) or to facilitate mutually-dependent relations with buyers and suppliers, such as delayed payments for inputs supply (zero interest, “loans in kind”), interlinking credit with inputs supply and marketing, leasing or accepting outside investment (“hostage taking”, joint ownership) of long-term assets.

Business farms have been quite successful in benefiting from the various preferential public support programs (SAPARD, State Fund Agriculture) developing good proposals, meeting formal requirements, dealing with complicated paper work, and “arranging” selection of their projects for modernization and expansion of enterprises, diversifying into related businesses, improving environmental performance etc. Furthermore they get the greatest share of EU CAP support measures (direct payments, agrarian and rural development support etc.) which enhance additionally their efficiency.

In marketing farm output and services, classical trade across the market (sells on wholesale market; business with market agents) dominates. Since the main part of a farm’s product has a

standardized (commodity) character, market prices and competition effectively govern relations with partners. However, when specificity of output to a particular buyer (processor, retailer) is high (technology, quality, packaging, time of delivery, origin, site-specificity) then delivery contracts with a respective partner are employed to tailor or protect transactions.

Intra-firm processing and retailing is practiced by some farms. Larger operational size and frequency of transacting provide an economic opportunity for the internal exploration of interdependent assets in farming-processing-retailing. Vertical integration helps protect dependent investments and payoffs from marketing processed and retail products - e.g. getting the entire profit (value-added and final products), brand name trade, lessened market dependency (easy storage and transportation) etc.

Large business farms have significant comparative advantages in terms of adaptability, governance, and productivity. That leads to further redistribution of farming activities into this effective and perspective structures. Accordingly, agricultural is increasingly characterized by the domination of larger and highly competitive business enterprises, which will take over and concentrate most activities in all sub-sectors. Business farms will sustain in future maintaining (enhancing) their comparative advantages in terms of adaptability, governance, and productivity by having greater access to EU markets and opportunities to benefit from the large public support programs for agrarian and rural development.

The cooperatives concentrate a major part of cereals, oil and forage crops, orchards and vineyards, and they are key service providers for their members and rural agents. Long-term cooperative tradition was an important factor for emergence of more than 3000 ‘new type’ production cooperatives during and after the liquidation of old “cooperative” structures.

Furthermore, often the cooperative was the single form for farming organization in the absence of settled rights on main agrarian resources and/or inherited high interdependence of acquired by individuals assets [Bachev, 2006]. More than 2 millions Bulgarians have got individual stakes in the assets of liquidated ancient public farms. In addition to their small size, a great part of these shares were in indivisible assets (large machinery, buildings, processing and irrigation facilities). Therefore, new owners had no any alternative but liquidate (sales, consumption, distortion) or keep them up as a joint (cooperative) ownership. In many cases, ownership on farmland was restituted with adjoined fruit trees and vineyards, and much of the activities (e.g. mechanization, plant protection, irrigation) could be practically executed solely in cooperation. Most of landowners happened to live away from rural areas, have other business, be old of age, or possess no skills or capital to start own farms. In the absence of big demand for farmlands and/or confidence in emerging private farming, new evolving cooperatives have pulled land plots of more than 40% of novel proprietors in 1990s.

The cooperative rather than other formal collective (e.g. firm) mode has been mostly preferred. It allows individual members easy (low costs) entree and exit from the coalition, preservation of full control on a major private resource such as land, and democratic participation in (and control on) management (“one member-one vote” principle). Besides, cooperative form gives some important tax advantages such as tax exemption on sale transactions with individual members and on received rent in kind (Double-taxation Law). Also there are possibilities for organization of transactions which are not legitimate for other modes such as credit supply, marketing, and lobbying at nation-wide scale (Antimonopoly Law). Moreover, most of cooperatives develop along with or after emergence of small-scale and subsistent farming. Namely, “non-for-profit” character and strong member (rather than market) orientation attracted membership of many households. Production coops have been perceived as an effective (cheap and stable) form for supply of highly specific to individual farms inputs and services (production of feed for animals; mechanization of major operations; storage, processing, and marketing of farm output), and/or food for household consumption.

Relatively bigger operational size of cooperatives gives them great opportunity for efficient use of labor (teamwork, division and specialization of work), farmland (cultivation in big consolidated plots, effective crop rotation, application of chemicals and irrigation), and material assets (exploration of economy of scale and scope on large machinery and equipment). In addition, they have superior potential to minimize market uncertainty (“risk pooling”, advertisement), and organize some critical transactions (better access to agrarian credit; stronger negotiating positions in input supply and marketing, facilitate land consolidation through lease-in and lease-out deals; introduce technological innovations, effective environmental management), to invest in intangible capital (reputation, brand names, labels, origins) etc. In situation of “missing markets”, the cooperative mode has been the single form for organization of certain transactions in villages and rural areas undertaking bakery, processing, retail trade etc.

Cooperative activities are not difficult to manage since internal (members) demand for output and services is known and “marketing” secured. In addition, coops concentrate on a few highly standardized products (wheat, sunflower) with a stable market and good profitability. All this assists financing, as advance funding of activities commissioned by members is commonly practiced, while producing universal (mass) commodities is easily financed by public programs or commercial credit. Furthermore, coops offer low-cost, long-term leasing of land. That is often coupled with simultaneous lease-out deals as a specific mode for cashing coops output or facilitating relations between landlord and private farms. The cooperatives broadly practiced an integral organization of critical “services” and inputs supply benefiting from internal specialization and division of activity. Marketing of risky output is governed by effective delivery contracts or integrated into own processing.

Output-based payment of labor is common, which restricts opportunism and minimizes internal transaction costs. Besides, production cooperatives provide employment for members who otherwise would have no other job opportunities - housewives, pre-retired or retired persons. They are preferable employer since they offer relatively high job security, social and pension payments, day-offs and paid annual holidays, and opportunity for professional (including career) development. Given the considerable transacting benefits, most of the coop members accept lower than market returns on their resources - lower wages, inferior or no rent for land and dividends for

There have been some adjustments of size, memberships, and production structure in cooperatives (Table 1). A number of them have moved toward more “business like” governance applying market orientation, profit-making goals, close and small-membership policy, complex joint-ventures with other organizations etc. That has been a result of overtaking the coops management by younger entrepreneurs, improving the governance, taking advantage from new market opportunities and public support programs, and establishing of some of them as key regional players.

At the same time, traditional cooperative has shown certain disadvantages as a form for farm organization. A large coalition (averaging 240 members) makes individual or collective control on management very difficult and costly. That gives great possibility for mismanagement and/or let using coops in best interests of managers and groups around them (on-job consumption, unprofitable for members deals, transfer of profit and property, corruption). Besides, there are differences in investment preferences of diverse members due to the non-tradable character of cooperative shares. While working and younger members are interested in long-term investments and growth of salaries, income in kind, other on-job benefits, older and no working members favor current gains (income, land rent and dividend). Given the fact that most of the members are older in (pre-retired and retired) age, smallholders, and non-permanent employees, incentives for long-term investment in cooperatives have been very low. Finally, many co-ops fall short to adapt to diversified (service) needs of members and explore the potential of inter-cooperative modes (joint ventures, associations). Accordingly, long-term comparative efficiency of cooperatives

diminishes considerably in relation to other modes for organization (market, contracts, partnerships, alliances), and 59% of them have gone bankrupt or ceased to exist after 2000.

Most of the existing cooperatives will sustain in years to come since they will keep their production and organizational advantages to a large number of petite landowners, rural labor, small and subsistent farms. What is more, they have a greater potential to explore economies of scale and scope on institutionally-determined investment, adapt to formal requirements for support, and use expertise and finance to execute public projects. Furthermore, diverse and considerable CAP support measures (direct payments, investment subsidies, rural development projects) give a new opportunity to mitigate the coops funding problem. Direct payments for instance, allow the extension of activities and offer attractive rent, while access to investment subsidies let modernize farms and enhance competitiveness. Besides, some environmental, infrastructural, and rural development projects, which require large collective actions and coalition of resources, could be effectively initiated, coordinated, and carried by the existing cooperatives or mix (coop-private, coop-public) modes. That will extend and intensify transactions governed by existing cooperatives. Adaptability of cooperative to new challenges would be significantly increased through public training of their staff in business and agro-environmental management, carrying out an effective control on coops activities, and providing assistance in farm and cooperative associations.

Unregistered holdings are predominantly *small-scale farms* comprising the biggest portion of all farms (Table 1 and Figure 11) and agricultural employment⁶⁴.

Most private farms evolved after 1989 when agricultural land was restituted, and assets of large public farms distributed or privatized. Agrarian reform turned most households into owners of farmland, livestock, equipment etc. Internal organization of available household resources in an own farm was an effective way to overcome great institutional and economic uncertainty, and minimize costs of transacting [Bachev, 2006]. Private rights on most of farmlands were not entirely restituted until 2000 making market trade with land very difficult or impossible. Besides, there was “oversupply” of farmland and the effective demand was not immense. In the meantime, many Bulgarians lost their jobs as a result of privatization of public farms and industrial companies. Starting up an own farm was the most effective (or only) mode for productive use of available resources (free labor, land, technological know-how). Moreover, a large portion of people was at pre-retired or retired age and had no other job alternatives. For others farming was a stable “temporary” or secondary employment in conditions of high insecurity of job market. Diversification into farming took place and now farming is “sole or major employment” just for a quarter of “engaged persons in agriculture” while for almost 1 million it is an “additional source of income” [MAF].

During transition, market or contract trade of household capital (land, labor, money) was either impossible or very expensive due to “missing” markets, high uncertainty, risk, asymmetry of information, opportunism in time of hardship, little job opportunities and security. Moreover, low payoff from outside trade (high inflation; non- or delayed payment of pensions, wages, rents) was combined with an increased share of households’ food costs. Therefore, internal organization was the most effective way of protecting and getting a return on resources and securing a stable income. Long-term tradition with “personal plots” during communist period, and insignificant costs for acquiring specialized knowledge (information, training, learning by doing experience) made development costs for own farm accessible for everybody. In addition, there has been a great (price, quantity, quality) uncertainty associated with market supply of basic foods (many new suppliers, no reputation built, poor assortment, insufficient enforcement of quality and safety standards). For lots of consumers an internal organization (own production) has been an effective

⁶⁴ Accordingly 95% of the employed persons and 92% of the Annual Work Units of the sector [MAF].

mode to guarantee cheap, stable, safe, and high quality delivery of food. Also, for many Bulgarians, farming activity happens to be a favorable full-time or free-time occupation.

Unregistered farms are not a unified group since there are numerous subsistent and semi-market farms as well as highly-commercialized small to middle-size enterprises. The best part of Bulgarian farms are *subsistent* and *semi market farms*. According to the last census less than 39% of unregistered farms reportedly sell products, and in more than 50% of the cases, those are surplus, not consumed by households [MAF]. Consequently, a significant portion of the entire output of vegetables, fruits, vine and livestock is for “self consumption”.

Governing of small-scale and subsistent farms is not associated with significant costs. Unregistered farms are predominately individual or family holdings, and farm size is exclusively determined by the available household resources – family labor, own farmland and finance. Internal governing costs are insignificant because transactions are between family members (common goals, high confidence, and no cheating behavior dominates) or non-existent (one-person farm). Costs for coordination and organization of activities are not big as primitive technologies are applied; (internal) demand and potential are known; and common objectives, cooperating behavior, and high trust govern relations between family members.

A small collective organization for some activities is also practiced - e.g. group pasture of animals, common guarding of yields, common processing and marketing. That allows a partial specialization and division of labor, exploration of economies of scale and scope, and/or makes part-time farming possible. This form is cost-effective since transactions are not complicated, easily controlled, and between close friends, neighbors, and relatives (here mutual trust and self-restriction of opportunism govern relations).

Occasional outside supply of some inputs (seeds, chemicals) and services (veterinary) take place but they are not connected with significant costs because of highly standardized and not farm-specific character (many suppliers). On the other hand, highly specific to farm transactions (feed supply for animals, mechanization and irrigation services) are effectively secured through a joint ownership mode such as cooperative or group farming.

“Marketing” of the output for subsistent and semi-subsistent farms is not associated with considerable costs because most of it is for internal household consumption or processing. Excesses are exchanged with relatives and friends, or sold at local (farmers, street) market, to regional middleman or processor. In any case, low volume, high frequency, and personal character of the transactions (clientalization) minimize the costs of marketing.

There are also a good number of small-scale *commercial (market oriented) farms* among the unregistered holdings. They are mainly in labor-intensive productions such as vegetables, tobacco, vineyards, berries, melons, flowers, mushrooms, medicinal and aromatic crops, livestock, sericulture, bee keeping, and in natural meadows. Those are individual or family enterprises, and farmers have strong incentives to adapt to market demand and increase productivity (through intensification of work, investments in human and material assets) since they own the whole residuals (income). Own farm enterprise has been a secure mode for providing (full or part-time) employment for household members (including retired, housewives, children). Family organization is also an effective form for intergeneration transfer of farm-specific intangible assets such as know-how, learning by doing experience, reputation etc.

The extension of farms through outside supply of labor and services is restricted since directing, monitoring, and disputing costs are extremely high in labor demanding and spatially dispersed productions. External financing of farming via debt, equity sell-off, or preferential public programs have been out of reach because of the high costs for preparing project proposals; for meeting formal (paperwork, ownership, co-financing) requirements; and for “arranging” funding. That has been additionally complicated by the big transacting uncertainty, asymmetry of information, and strong specificity (“berried in land”) and risk (“mobile character”) of investments in agriculture. Thus, possibility for effective farm enlargement and growth in

productivity through mechanization, application of chemicals and innovation is limited by the small internal investment capacities (savings, profit). As a result, outdated technologies, low productivity, and poor quality, labor, animal-welfare, and environmental standards prevail.

Low cost outside land supply (leasing) is practiced to explore economies of scale on existing assets, and integrate the critical inputs supply (such as forage for livestock). For external supply of indispensable inputs and services market supplier or ownership modes (cooperative, group farming) is typically used according to the level of specificity of supply. In many instances, they are not provided at efficient scale due to the enormous costs of delivery as it is for pesticides, fertilizers, irrigation, extension etc.

In some intensive areas (e.g. off-season vegetables and fruits, horticulture, melons) small-scale farming has been quite effective in quality and price competition bringing good income for households. Profitability of these farms has been especially big when there exist special nationwide organization for marketing (e.g. bee honey); production planning and price support (e.g. quotas and guaranteed prices for tobacco); inputs supply and marketing (e.g. sericulture). When symmetrical (capacity, quality, time of delivery) dependency is in place then tight marketing or interlinked⁶⁵ contracts with downward partners (processors, supermarkets, exporters) have developed which govern transactions effectively (in dairy, vegetables). Principally marketing of output is not associated with considerable costs for commodity and locally-demanded produces because of short distance, low volume, high frequency, and personal character of transactions. Besides, some produces of small farms (fresh fruits and vegetables, dairy and meat products) enjoy increasing demand because of the low level of intensification (reduced or no chemical use, extensive breeding of animals), high quality, freshness and good taste, authentic local varieties, bigger confidence of consumers about safety and origin.

Nevertheless, the majority of small commercial farms is vulnerable and has poor mechanisms to protect from outside institutional, market and natural disturbances. Most of them have little ability to meet institutional and market restrictions, bear risks, and safeguard against natural and market hazard (buying insurance, diversifying, or cooperating). All these result in significant income variation for individual farms, (sub) sectors, and different years.

A great number of small-scale farms face great transacting difficulties in marketing of their output. Most often they are not preferable partners for big buyers because of small volume and less-standardized character of output, and impossibility (unaffordable costs) to verify quality of products through laboratory tests, and certificates. On the other hand, official wholesale markets have been inaccessible for these farms for the reason of great distance; high fees; requirements for volume, special preparation, certification etc. Besides, small farms frequently experience problems with meeting contractual terms (none or delayed payment), huge market price fluctuation, (quasi-) monopolistic situations, and missing markets in remote regions.

In order to protect transacting and avoid unwanted exchanges the primitive forms for risk minimization is commonly used - investment in more universal but less profitable assets, diversification of production, informal cash and carry deals, direct retail marketing etc. With exception of tobacco producers⁶⁶ development of effective collective organizations for risk sharing, price negotiation, marketing, or lobbying for public support have been difficult because of high transacting costs and diversified interests of individual farmers (old-young; larger or smaller size; specialized or diversified etc.).

Different fractions of the unregistered farms are with unequal sustainability. Unlike other forms of organization the life cycle of one-person (family) farm is greatly determined by the age of the entrepreneur. Thus, farms are unsustainable when farmers are close to the end of working age, and they have no heir wishing to take up the farm or have more than one successor wanting

⁶⁵ Typically marketing against credit, inputs and/or extension supply.

⁶⁶ having a significant political representation.

to get the enterprises⁶⁷. Moreover, incentives for long-term investment in specialized assets for increasing sustainability is low for older farmers since there is no secondary market for farm-specific assets (such as investments in human capital, training, know-how, good reputation, organizational modernization, positive externalities). For that reason a good number of small-scale commercial farms will operate at low sustainable level (at present or smaller scale) given that most of farm managers and laborer are old in age⁶⁸.

The EU integration and CAP implementation will also foster the restructuring of commercial farms according to modern market, technological, and institutional standards. Most small-scale livestock farms will hardly meet the EU (hygiene, quality, veterinary, phito-sanitary, environmental, animal welfare) standards and have to cease the formal commercial activity by the end of 2009. Only few livestock farms will be able to increase their present size with additional specialized investments in modern technologies, food safety, animal welfare and environmental protection. That would enhance their capability to compete, meet strict institutional restrictions, and participate in various public support programs. Increased scale of operations will also require some stable forms for governing of marketing such as cooperation or tight contracts with dairy and meat processing industries.

A process of consolidation and modernization is taking place in some horticultural farms as well. In years to come market, contract, and institutional uncertainty will be steadily diminishing while access to public support programs augmenting with application of CAP measures. That will further enhance sustainability of smaller-scale intensive family operations. In some cases, small partnership, group farming or vertical integration by buyer (e.g. processor, exporter) will be used to achieve rapid concentration of capital and labor.

Tobacco farms are located in mountainous and less-developed regions with little farmland and no alternative job opportunities. They will continue to enjoy high public support because of the political power (preferential production or regional support policies). However, due to the global tendency for declining demand and restriction in production (quotas) the restructuring of this sub-sector is inevitable. Thus modernization and diversification with no significant changes in mode of organization (specialized small-scale family operation) will occur.

The strong competition will be predictably connected with decreasing the number of small commercial farms of various types as a result of take-overs, joint ventures, failures, or non-market orientation. There will be also a parallel tendency toward specialization into productions for “niche markets” and products with special quality (specific origins, organic products, eggs from freely-breed chicken, meat with low fat level, grape for special wines). That will require investments with increasing or high specificity to a particular buyer(s), and “integrated” management of farming, processing industries, food chains, exporting (associated with specification of production technologies, products quality and quantity, time of harvesting and delivery etc.). Besides, some diversification of enterprises into related activities (trade with origins, agro-tourism etc.) as mode for dealing with market risk should be expected. And finally, high inter (cite, capacity, quality etc.) dependency will require expansion of the modes for vertical integration with downstream industries [Bachev and Nanseki].

Preliminary assessments of likely impact of CAP implementation in Bulgaria indicate that income, technological, environmental and social discrepancies between farms in different sub sectors and regions, and between small holdings and larger operators, will further augment [Bachev, 2008]. The enhancement of sustainability of small-scale commercial farms would be considerably accelerated through a third-part public involvement in training and extension education, assisting in farm association, and increasing accessibility to various support programs

⁶⁷ Disputes between heirs about agricultural lands are widespread and that is a major factor for the big fragmentation of land ownership and farms in Bulgaria.

⁶⁸ Farm managers older than 45 and 65 are 85% and 40% accordingly [MAF].

(improving transparency, decreasing bureaucratic procedures, providing preferences for small-scale enterprises and disadvantages regions).

At the same time, restructuring a large portion of smaller-scale and subsistent farms will have no positive effect. There has been a significant diminution of institutional and market uncertainty in recent years. However, most of the factors that brought to existence subsistent and semi-market farming persist – high economic insecurity and unemployment, low income and purchasing power of households, limited demand for agrarian resources and products, uncertainty associated with market supply of food (freshness, safety, quality, price). The situation has even worsened as a result of the present global economic and financial crisis. Most subsistent farms have no intention of increasing their size because of other major occupations and income source, limits of household demands and resources, the advanced age of farmers etc. Transaction costs to enlarge farms through outside supply of additional land, labor, finance and marketing are extremely high (no entrepreneurial capital exists). Vast costs for studying and respecting new institutional restrictions (laws, regulations; quality, veterinary, eco, animal welfare etc. standards) and for establishing “relations” with agrarian bureaucracy (registrations, certifications, paper works) is also restrictive. Moreover, more than a half of employed in agriculture are in pre-retirement or retirement age [MAF]. That puts serious restrictions on effective farm adjustment and enlargement - low investment activity and entrepreneurship, limited training capacities, no alternative employment opportunities.

On the other hand, there is practically impossible for Government to enforce the official standards in that huge informal sector of the economy. What is more, there is a strong political pressure to relax application of EU rules in non-market farm transacting (respect voters interests). Therefore, the majority of subsistent farms will be highly sustainable in years to come.

CONCLUSION

Deepening the labor specialization and exchanges between agents opens up enormous opportunities for economic growth. However, it is also associated with significant transaction costs which might disturb sustainable development. In the traditional (Neoclassical Economics) framework with no transacting costs there is only one mechanism for governing of agrarian development. “Free market prices” (and market competition) effectively coordinate and stimulate the entire activity of resource owners, entrepreneurs, and consumers. Accordingly all farms constantly “adapt” to price movements and social demand being equally efficient and sustainable. Rare cases of market “failures” are also recognized (“negative externalities”, “tragedy of commons”) but a perfect “government intervention” is seen as a remedy. All that leads to an interrupted global sustainable development.

In the real economy, there are additional important factors affecting individual choices and agrarian sustainability (namely institutions and transacting costs), and a great variety of effective governing mechanisms. The institutional environment is a crucial factor, which eventually determines the “type” of development and the “level” of agrarian sustainability. The individual agents tend (have) to govern available resources in the most economical way adapting to institutional environment and minimizing total (production and transaction) costs. Depending on personal characteristics of agents and the critical attributes of each activity, there will be a spectrum of effective structure for organization of agrarian resources, activities and exchanges – some will be governed by “invisible market hand”, other by special contract forms, some by “visible manager hands” or within complex hierarchies, other will be supported by a third-party etc. Accordingly, at any given period of time, farms and agrarian organizations of various type and size would persist (sustain) in agriculture - subsistent, family, cooperative, corporative etc. Furthermore, the sustainable development does include a fundamental modernization of farming structures – size adjustment, transformation, coalition, and disappearance of farms.

Our new framework helps us better understand the factors for sustainable development and the “Government’s role” as well. The analyses of transaction costs identify an immense range of “market failures” associated with unspecified or badly specified property rights; inefficient system for enforcement of absolute and contracted rights; high uncertainty and dependency of activity, and low appropriability of rights. The economic agents deal with market deficiency developing different non-market forms for effective governance (contracts, internal modes, collective actions etc.). Nonetheless, private sector also “fails” to safeguard individual rights and carry out certain activities at effective scale. That is particularly true for human and eco-rights, technological and infrastructural development, environmental conservation activity etc. Thus there is a strong need for a third-party public involvement in market and private transactions through institutional modernization, assistance, regulation, hybrid or public organization.

However, diverse forms of public interventions are with unequal efficiency and the most efficient one is to be selected taking into account the overall transaction costs and contribution to sustainable development. What is more, at present stage most public interventions increasingly require concerted actions (multilateral and multilevel governance) at local, regional, national, transnational, and global scale. Nevertheless, “government failure” is also possible, and inappropriate involvements, under or over-regulations, mismanagement, corruption etc. are widespread around the world. Agrarian sustainability is significantly compromised when market and private sector fails, and no effective public intervention takes place.

The comparative institutional and transaction costs analysis of the environmental governance in Bulgarian agriculture let us specify the driving factors for emergence and persistence of environmental problems (risks), and make more realistic forecast about the eco development. Contemporary development of agriculture is associated with specific (and quite different from other European states) environmental challenges, some of them reaching up to the point of no or limited management. That has been a result of the specific institutional and governing structure evolving in the sector during the past 20 years. Our analysis also shows that implementation of the common EU policies will have unlike results in “Bulgarian” conditions. In short and medium term it will enlarge income, technological, social and environmental discrepancy between different farms, sub-sectors and regions. In a longer-term environmental hazard(s) caused by the agricultural development will enlarge unless effective public and private measures are taken to mitigate the existing environmental problems. What is more, the specific structures for effective governance of farming (such as subsistence farming, production cooperatives, small-scale commercial farms, and large business firms) will continue to dominate in years to come. Nevertheless, a significant improvement of public (Government, EU etc.) interventions is needed in order to enhance sustainability of prospective farms and sustainable agrarian development.

The identification of efficiency, complementarities, and sustainability of different modes of environmental governance has a substantial importance for amelioration of public policies and individuals and collective actions. Firstly, it helps anticipate possible cases of market, private sector, and public (community, Government, international assistance) failures, and design appropriate modes for public intervention. In particular, it facilitates formulation of specific policies and institutional framework to overcome the existing environmental problems, and safeguard against the possible eco-risks, and avoid the severe environmental challenges in other developed countries. Next, it could assist individual and collective actions and organizational modernization in agrarian sphere for successful adaptation to changing economic, institutional and natural environment.

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