



ST. ISTVÁN UNIVERSITY OF GÖDÖLLŐ

**EXAMINATION OF SUSTAINABILITY OF AGRICULTURE
AND ITS MEASUREMENT POSSIBILITIES**

PH.D. THESES

GÁBOR LAKI

Consultant:

Dr. Ferenc Szakál, C.Sc., professor

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Doctoral school

name: Management and Organization Sciences

discipline: management and organization sciences

leader: Dr. István Szűcs, DSc.

professor, Doctor of Agricultural Sciences

St. István University of Gödöllő, Dep. of Economic Sciences

Consultant: Dr. Ferenc Szakál, C.Sc.

professor

Department of Agricultural and Environmental Sciences
Institute of Environmental and Landscape Management

Leader of research program

Consultant

TOPICALITY OF THE RESEARCH'S SUBJECT

The practical meaning of sustainable agriculture and the roles of the agriculture in the rural development are much debated questions. Consequently, there are many different points of view exist to interpret the sustainable agriculture's meaning. It is very difficult to approach these interpretations because last two decades, the sustainability and the roles of sustainable agriculture are become themes so discussed that there is a great number of literature on put into practice the sustainable and multifunctional agriculture and of different definitions for it but still no generally accepted definition exists and suggestions for the practical realization of the sustainability concept in agriculture is very scarce. At the same time many different positions exist on these issues and many experts and responsible politicians express their dissatisfaction at the delay in reforming agricultural policies including the CAP of the European Union. Consequently it is clear also that the relations between agriculture and rural areas can not be explored clearly. Despite of the existing efforts no real progress has been achieved so far in reforming agricultural policies and in integrating different policies (e.g. agricultural policy, agri-environmental policy, rural development policy) which are existing simultaneously and they could result in opposite line.

In the other hand, during the last two decades the sustainable development and the sustainability of agriculture have become so fashionable research fields therefore there is a vast number of literature about these but many of all scientists repeat controversial generalities in their works without practical suggestions how to realize their concepts in practice.

Despite of a great number of literature it has to spend a lot of time understanding the concept of sustainability that can realistically define the three (ecological, economic and social) dimensions of sustainability referring to agriculture. This is the base of real integrated approach which can clarify the question "how to understand the sustainability of agriculture, what are that functions needed to preserve that agriculture could meet requirements of sustainability, and which resources and what quality and quantity we need to preserve in order to the agriculture could contribute to development of rural areas?"

Several Hungarian and international publications have come out and high level EU resolutions have been passed that emphasize the necessity of an integrated approach. However, we have hardly made a step forward in this matter at EU level. While more and more experts and conferences deal with the development of rural areas, nowadays it seems, everybody is trying to avoid giving answers to the fundamental questions. In many cases, even the experts of rural development take it as a step backwards to bring up the idea of integrating different policies. Consequently, agriculture, nature management, environmental policy, farming methods, rural lifestyle and culture and infrastructure, etc. function and are developed separately from each other, according to their own guiding principles. This separated process does not create developed rural areas that are capable of moving forward, it may only create "scarcely-inhabited city-like settlements". **This kind of 'rural development' may never be economically efficient**, also more and more 'rural development subsidy' is needed to keep up the level already reached. Therefore, it is impossible to give either an economic or a social reason for **compensating the economic drawbacks** of misinterpreted rural development (e.g. higher expenses of transport and other services, owing to the lower number of population and other

economic disadvantages deriving from smaller dimensions). In the meantime, rural areas are gradually losing the positive features that were once much appreciated by the society.

The competitiveness of rural areas can only be enhanced by the complete utilization of their own natural and human resources. Developments based on outer resources (e.g. industrial instruments, technologies and expertise) and setting up a standard of living in the country close to that of the city do not enhance rural competitiveness, but they only conserve it together with the dependency on the cities.

The frequently-quoted ‘sustainable agriculture’ has several roles apart from effective and competitive production, such as offering positive provisions indispensable for and acknowledged (compensated) by the society. If we have a closer look at this connection, we must realize the ‘viable’ countryside cannot exist without ‘viable’ agriculture; however, developing agriculture is not the only way to develop the countryside. Available data clearly show that **the national-economic importance of agriculture (2-3% on average throughout Europe) and its contribution to the support-capacity of rural areas cannot be increased despite developing attempts, but merely ‘sustained’, which necessitates the careful reconsideration of the already-existing rural development conceptions.**

This recognition is supported by the analysis made by the EU for their planned 2007-2013 budget in which experts admit: despite all the developing attempts and the higher payouts to be spent on agro-environmental protection in various, not production-oriented agricultural activities, the proportion of European rural population making a living on agriculture is gradually decreasing as well as the value added by agriculture. These phenomena support the recognition that **we cannot expect agriculture** solely to solve the problems of rural areas. At the same time, agriculture can only play a significant role in rural life if it regains its tasks already lost or given-up, and contributes to a growing extent to developing rural areas and raising standard of living in the country. Namely, the aim of agriculture cannot be production-growth or making the most net proceeds in agricultural enterprises.

The purpose of research on agricultural sustainability is to work out adequate agricultural policies to meet practical needs and create production methods in accordance with these policies. The reason why this is a slow process is that in Hungary as well as in the rest of Europe present-day agricultural subsidy systems are still bound to production functions. The indicators that are in use nowadays do not provide sufficient and realistic information about the efficacy of production considering the criteria of agricultural sustainability. Also, their complexity makes it impossible to collect data at economy level. To resolve these problems, I suggest using an integrated indicator which is based on the heuristic search of farmers, and through its ‘integrated impact’ it will promote the whole economy to move towards sustainability.

RESEARCH PRINCIPLES AND PURPOSES

Throughout centuries agriculture was developed by specialisation and division (disintegration) of functions. In the past decades these tendencies have exceeded the economically-justified extent. That is why the close connection between agriculture, nature resources and the social conditions of rural areas has become unbalanced. As a result, agricultural activity has done grave harm to the natural environment as well as to social conditions. It is also losing its capability to contribute to the sustenance of rural population. Certainly, the development of agriculture is an irreversible process and it should not be an accepted goal neither economically nor socially (e.g. using manual labour again instead of up-to-date motorized technologies). **The important role of agriculture in the past life of rural areas cannot and need not be restored**, but a multifunctional approach to agriculture may have great significance in practical implementation.

The changes resulting from the development of agriculture are manifested in the social structures of settlements. While the structure of early settlements was adjusted to the given agricultural assets of the area, the gradually growing early towns and cities added further functions to the already-existing agricultural-community functions such as the function of defence, trade and social functions. This is how **some well-situated 'rural' settlements rose above the others and took a leading position**; parallel with this, they slowly broke away from the rural environment they had emerged from. In order to give an overall assessment of these processes, it is worth investigating how far the progress has come, that is **what role rural communities play in the life of European cities**, and what kind of message is carried in this role for future generations. Namely: Is the countryside important enough for us to sustain it? If we know the answer to these questions, we also know how to interpret sustainability in agriculture, whether agriculture and the system of rural areas related to it are sustainable at all. We must not forget that the **European (including Hungarian) society is to undergo a radical transformation that may lead to the disappearance of many now-existing rural communities**. This is in contrast with all the criteria of sustainability.

Several excellent authors have tried to put a proper light on the essence of sustainable agriculture, and describe the system of connections between agriculture and rural areas. However, different authors represent different points of view as to what the problems are. In my research, it has become certain at an early stage that **one root of the problems is that so far no one has been able to (willing to) define the concept of sustainability practically, in an operative way**, which has generated even greater disputes in the interpretations of agricultural sustainability

In my research, I paid careful attention to the interpretations of sustainability in the development of agriculture in post-war European countries including Hungary. I also looked at how we could characterize this development as a disintegrating process. Right at the beginning I had to face with the difficulties of empirical examinations and of applicable approaches. I did a survey in the three-decade progress of Common Agricultural Policy and in its reforms (e.g. changes, present-day tendencies, constant problems, etc.) before and after the joining from the 3-dimensional aspect of sustainability. It is only after uncovering this problem that we can thoroughly

comprehend the connection system between agriculture and rural areas, its gradual transformation, and then we are able to shed light on the reasons for the changes as well as on the key role of agricultural policy in these tendencies. If we want to put agricultural sustainability into practice, it is essential to define the basic principles and implements that positively influence the relations between agriculture and rural areas. It is even more an important question now that the Hungarian agricultural policy has become part of the Common Agricultural Policy that has intended to keep up the model of sustainable 'European agriculture' introducing several reforms for three decades now.

For interpreting sustainability agriculturally, we must review shortly the indicator system that international organisations created (FAO, OECD, EU, etc.). In this section, I am examining how applicable these indicator systems are to measure agricultural sustainability and which dimension of sustainability they describe. In my essay, I am also proposing the use of a different indicator which, in my studies, has proved to be the most adequate one to measure sustainability at farm level. Firstly, I am clarifying the system-theoretical background of the so-called '*locally added value*' based on heuristic self-organisation. Secondly, I am working out the calculating method of this new indicator. Finally, I am testing its practical applicability.

In my research, I endeavoured to classify different problem areas, so that – by careful examination and summary of the results – I could find the answers to the basic questions of the research. Accordingly, the essay deals with the following topics:

- The connection between agriculture and rural areas
- The connection between agriculture and environment
- The development of agriculture and the role of European and Hungarian agricultural policies in the process
- The interpretation of sustainability, the problems of agriculture's contribution to the development of rural areas
- The global problems of measuring agricultural sustainability, suggestions based on research findings

RESULTS

Having read available Hungarian and foreign special literature for my research, I must state that I did not find a unified point of view accepted by all experts about how to define agriculture, rural areas and what role agriculture plays in their sustenance and development. Although almost all the authors set the integrated approach to be an important requirement, most of them treat sustainability as an environmental problem pushing its economic aspects into the background, and they hardly take social dimensions into consideration.

Concluding from the problem analysis and from the concepts and goals not clarified completely, **I suggest defining rural areas** as the following: on one hand, **as a complex of the environmental, human and man-made resources** (built environment, cultivated land, cultural values, lifestyle, customs, etc.), on the other hand, **as the closely integrated system of agricultural, economic and non-economic human activities** as well as **environmental-, regional- and natural economy**. Thus **agriculture** is a subsystem of rural areas, consequently **it can only be integrated and multifunctional**, meeting the requirements defined by the EU's 'European agricultural model'. This kind of sustainable agriculture has several tasks other than effective and competitive production. These tasks are indispensable and provide acknowledged positive provisions for the society. Uncovering this connection, we find that 'viable' countryside cannot exist without 'viable' agriculture, however the development of rural areas does not equal to the development of agriculture only. Considering the data available and real-life processes, **I must state that the national-economic importance of agriculture** (2-3 % on average throughout Europe) **and its contribution to the development of rural areas cannot be increased despite the attempts of development, but merely 'sustained'**. **This recognition makes it necessary to closely examine and reconsider the rural development conceptions that already exist**. The analysis the EU made for the planned 2007-2013 budget provides us with an evidence for this process. In this, experts admit: despite all the developing attempts and the payouts to be spent on environmental protection in various, not production-oriented agricultural activities, the number of European rural population making a living on agriculture is gradually decreasing as well as the value added by agriculture. These phenomena support the recognition that **we cannot expect agriculture solely to solve the problems of rural areas**. At the same time, agriculture can only play a significant role in rural life if it regains its tasks already lost or given-up, and contributes to a growing extent to developing rural areas and raising standard of living in the country. Namely, the aim of agriculture cannot be production-growth or making the most net proceeds in agricultural enterprises.

The ongoing deterioration of rural areas and the diminishing importance of agriculture is not a nature-resource distribution or an environmental problem fundamentally, so the agro-environmental programmes can only slow down this process temporarily, but **cannot grow agricultural and rural support-capacity significantly**.

I reckon that **the damage done to the integrated structure of rural areas cannot be connected to an era or a date**; their one-sided dependency on urban settlements has evolved for centuries. **Owing to the lack of conscious development policies in the field**

of industry and provision, these rural areas lose their capacity to grow (viability). In these areas, depopulation is an irreversible process and we can give a more or less realistic estimate as to how long it will take. At the same time, effective and **multifunctional agriculture could provide** a small fraction of rural population with a living. **We need comprehensive social reforms** to give employment to people who are compelled to leave present-day Hungarian and European agriculture in search for other work. We must take notice of the fact that the traditional professions in agriculture and industry, which have centuries of history, are disappearing or at least being transformed while new types of provisional activities are coming into existence.

I find that rural areas are developed and function well only if they can produce the greatest possible welfare from the natural, human and man-made resources available. Therefore, **the state of development cannot be measured by the usual GDP index.** Although it is hard to work out a practically applicable indicator to measure welfare, as a first step, **we must modify the GDP index** as the following: **negative impacts** in rural areas (decreasing and aging population, environmental damage, loss of cultural values, etc.) must be taken into consideration as **value-decreasing items**, while **positive provisions** (development and maintenance of environmental, natural and regional resources, cultivation and maintenance of architectural and other cultural values) must be assessed as **value-increasing items**.

The integrated goal of could be contributing to rural welfare to the greatest possible extent. We must create a practical indicator to measure this contribution. In my essay, **I am proposing the use of ‘locally added value’**, the applicability of which may be justified by practice. **I am convinced that subsidy related to the increase of locally added value can; in fact, increase the support-capacity of rural areas, and it can also make the exploitation of local resources more effective.** The suggested indicator – based on heuristic self-organisation – may also involve all the goals of agriculture that have defining relations with all the basic elements of agriculture. Consequently, any change to this basic indicator would result in change to the whole agriculture.

From my research findings that have practical use I would like to underline the following:

- 1. The sustenance and development of rural areas can only be based on the definition and social acknowledgement of their special features and values.**
2. Although **agriculture** remains an important subsystem of rural areas in the future, **we cannot expect it to sustain rural areas in itself.** However, its contribution may be increased.
3. Greater contribution can only be carried out if it is **sustainable and developed in a multifunctional way.** In accordance with this, the old way of relying on outer (mainly industrial) instruments and output should be changed, and the effective use of local natural and human resources should be emphasized (so-called ‘resource-utilizing agriculture’)
- 4. Instead of overcomplicated and costly indicator systems, we need a simpler and integrated indicator** to measure agricultural sustainability, **which is capable**

of describing overall changes. I suggest that this should be the **locally produced added value (LPAV).**

- 5. In order to use LPAV in practice, data registering and accountancy should be modified accordingly.**
- 6. Increasing LPAV could also be a suggested base for subsidizing agriculture.**

NEW SCIENTIFIC FINDINGS

Based on the contents and the methodological principles applied in my essay, I have come to the following conclusions that are either new or of new type:

1. In the dissertation I gave an introduction and an overall assessment on the possibilities and problems of putting sustainable agriculture into practice.
2. Using the method of systematization, I uncovered the connections functioning between agriculture and rural areas, and thus I could make clear suggestions about the implementation of a so-called 'resource-utilizing' agricultural model that would promote the development of rural areas.
3. I pointed at insufficiency in the indicator system that is now recognised and widely-used for measuring international sustainability. My suggestion was to work out and introduce a simpler integrated indicator (LPAV) which is, however, capable of measuring the changes of the whole system.
4. I defined the calculation method of the 'locally produced added value', and revealed its insufficiencies.
5. Taking into consideration these insufficiencies, I proposed new data registry and accountancy serving as a basis of LPAV (that is measuring the productivity of sustainable agriculture).
6. I also proposed the introduction of a new LPAV-based agricultural subsidy system

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