

## RURAL COMPETITIVENESS THROUGH INNOVATION IN ROMANIA - OPPORTUNITIES AND RISKS -

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**Abstract:** *Innovation is the key driver of competitiveness, wage, job creation and long-term economic growth. The process of innovation involves interactions among a wide range of actors in society, who form a system of mutually reinforcing learning activities. Innovation system can be defined as a network of organizations, enterprises, and individuals focused on bringing new products, new processes, and new forms of organization into economic use, together with the institutions and policies that affect their behaviour and performance. The paper investigates the organisation and functioning of the Agricultural Knowledge System in Romania. On the basis of qualitative and system analysis approaches, we critically examined the set of public and private organisations dedicated to research, education and extension, and their interaction with knowledge users (traditional farmers) and the main system failures and strengths in the innovation process in agriculture were identified. The empirical research in this study had a heuristic value.*

**Key words:** *innovation, agricultural knowledge system, Romania.*

### INTRODUCTION

The transition from traditional agriculture (productive oriented) to sustainable agriculture can be seen as radical innovation. Innovation is a part of visioning and of the collective capacity to imagine and choose new development trajectories for rural areas – farms, businesses, communities and territories. The process of technological innovation involves interactions among a wide range of actors in society, who form a system of mutually reinforcing learning activities. Innovation system can be defined as a network of organizations, enterprises, and individuals focused on bringing new products, new processes, and new forms of organization into economic use, together with the institutions and policies that affect their behaviour and performance. Government, the private sector, universities, and research institutions are important parts of a larger system of knowledge and interactions that allow diverse actors with varied strengths to come together to pursue broad common goals in agricultural innovation.

The studies regarding innovation reveals that:

(a) the multifunctional character of the agriculture implies the multiplication of roles that farmers have in the society. The new roles (ecologic, socio-cultural, etc.) are assumed as far as the rural society perceives their importance, as well as the benefits generated by this new vision. According to our field study in rural localities from Romania, we conclude that the local human capital characteristics (age, education, occupational mobility) and the diversity of the potential economically exploitable resources are the most important factors stimulating multifunctionality at local level (Tudor, 2009). In a Europe where talks/debates about the agriculture's multifunctionality take place, in Romania there is still the problem of developing the agricultural exploitations system that will satisfy the primary function of agriculture, that of covering the food necessities of the population. Between the Romanian farms systems' structure and their contributions to the employment offer is a strong inter-conditional relation. Although Romania registers over 62% of the occupied rural population in agriculture, this fact cannot be associated in a real way with assuming the role of job offering in rural areas by the agricultural exploitation segment. The existence of a large number of small dimension farms – of subsistence or semi-subsistence – maintains a large volume of population that is under occupied in agriculture. This fact preserves an important part of Romanian rural households at the level of stringent essential need's covering and less in improving the living standard of rural communities' members (Tudor,

2011). The multifunctional development of the Romanian farm's system is not only a politic desideratum, but also a stringent necessity, a chance of improving the living standard of rural population in general. The Romanian farm system's structure is dominated by low and very low dimension exploitations (in 2010, according to the Eurostat data, 73% of the Romanian holdings produced less than 2000 euro standard output<sup>1</sup>/farm/year) that has major implications over the Romanian agriculture's capacity of responding to its economic function and, especially to its social function (shaped as limited chances of access to a decent living standard for the members of agricultural rural household and rural population in general). The reduced economic output level of the small farms constitutes an argument for the need of adopting of some strategies for multifunctional development as a mean through which the farm can contribute to the rural household members poverty risk's attenuation as long as the rural space provides few occupational opportunities outside the farm. The alternative of developing some non-agricultural activities within the agricultural exploitation (processing of some traditional food products for commercial interest, agro- or eco- tourism, small craftsmanship activities etc) based on its resources can generate the supplement of agricultural household member's incomes and achieving the farm's social function (Tudor, 2012).

(b) the information process is not a segmented process;

(c) a strong impact of the information process.

## MATERIALS AND METHODS

The analytical approach, proposed in the present study is based on mix of qualitative analysis methods because it is considered that qualitative methods are most appropriate for studying this phenomenon. The primary data was collected throughout semi-structured interviews, conducted face-to-face, in the period June-August 2014, by researchers from the Institute of Agricultural Economics (IAE), Bucharest under a bilateral cooperation project with Research Institute of Agricultural Economics (AKI), Hungary. The interviewees were selected to represent the full range of participants in the rural and agricultural innovation chains: Farming company; Farmers' cooperation and rural development clusters; Public sector (e.g. ministries); Bridging (e.g. innovation offices); Research; Private sector (e.g. input suppliers). The main topics covered during the interviews were derived from Biró et al. (2014) and targeted the following aspects: Description of the interviewee's organisation; Interpretation of innovation and knowledge transfer, assessment of innovation performance; Determining factors of the introduction, acceptance and diffusion of innovation; Innovation activities of the interviewee's own organisation, business or farm; Tools to encourage innovation; Other comments.

The interview results were processed using qualitative analyses involving the following steps: categorisation, contextualisation, metaphorical substitution, formal analysis and structural analysis.

## CURRENT STATE OF RESEARCH IN THE FIELD

Rural areas and rural communities are more and more seen as a platform and starting point for economic diversification and sustainable development. Farmers still are important social, cultural and economic actors in rural areas, while the non-agricultural population generally represents the majority of inhabitants. The current transformation of the European agriculture and farming sector towards multifunctionality (Huylensbroeck and

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<sup>1</sup>The *standard output (SO)* of an agricultural product (crop or livestock) is the average monetary value of the agricultural output at farm-gate price, in euro per hectare or per head of livestock. There is a regional SO coefficient for each product, as an average value over a reference period (5 years). The sum of all SO per ha of crop and per head of livestock on a farm is a measure of its overall economic size, expressed in euro

Durand, 2003), the growing importance of sustainable technologies that rely on a more efficient use of natural resources, and the reorientation of agricultural production towards non-food markets (such as energy crops) and service provision (Mahroum et al., 2007) involve ‘**vision creation**’ and strategic choices on the part of farmers and rural actors at large. These choices are made in the context of societal transformations that re-structure rural areas. Socio-demographic changes, the counter-urbanization movement, the flowing off of certain knowledge-based industries from cities to rural areas (for example, increasing placement of creative industries and new technology companies in the country), the construction of new spaces between towns and country (e.g. city regions, metropolitan countryside) (Muenchhausen, 2008) and the increased demand for quality of life based on rural amenities are driving such transformations (Knickel et al., 2008; Van der Ploeg et al., 2008) . However, there are global trends as well that affect European farmers and rural communities at micro and mezzo levels. Some examples are migration, climate change, and an increasing scarcity of fossil fuels, the instability of financial markets and the influence of distant regional conflicts. The complexity around strategic choices towards economic and social sustainability requires common vision creation. The question in this context is: who, what, how can bring about farmers to assume and internalize the multifunctional character in their farms and, at the same time, to respect the principles of sustainable development in order to meet this development model.

The transition from traditional agriculture (productive oriented) to sustainable agriculture can be seen as *radical innovation*. Innovation is a part of visioning and of the collective capacity to imagine and choose new development trajectories for rural areas – farms, businesses, communities and territories (see also Downey and Purvis, 2005).

**Value creation**, an approach to agricultural business largely consolidated outside the conventional knowledge systems, has been adopted by an increasing number of farmers in the last years. It is based on the ability to innovate by embodying sustainability into farm products and linking up to consumers willing to pay a higher price for environmental, ethical and taste quality.

International Assessment of Agricultural Knowledge, Science and Technology for Development report (IAASTD, 2009) indicates that Agricultural Knowledge, Science and Technology (AKST) have contributed to increased yields and aggregated wealth. AKST were one of the most important means by which can address the multifunctionality of agriculture by supporting the efforts of actors at different levels—from household to national, sub-global and global—to improve rural livelihoods and the environment in order to ensure equitable and environmentally, socially and economically sustainable development. In the recent specialty literature, the innovative processes are systemically approached and more and more frequent concepts such as “systems of innovation are used”. The process of technological innovation involves interactions among a wide range of actors in society, who form a system of mutually reinforcing learning activities. These interactions and the associated components constitute dynamic “innovation systems” (Fagerberg, 2005). Innovation systems can be understood by determining what within the institutional mixture is local and what is external. Open systems are needed, in which new actors and institutions are constantly being created, changed, and adapted to suit the dynamics of scientific and technological creation (Sumberg, 2005). The concept of a system offers a suitable framework for conveying the notion of parts, their interconnectedness, and their interaction, evolution over time, and emergence of novel structures. Within countries, the innovation system can vary across localities. Local variations in innovation levels, technology adoption and diffusion, and the institutional mix are significant features of all countries.

*An innovation system can be defined* as a network of organizations, enterprises, and individuals focused on bringing new products, new processes, and new forms of

organization into economic use, together with the institutions and policies that affect their behavior and performance. The innovation systems concept embraces not only the science suppliers but the totality and interaction of actors involved in innovation. It extends beyond the creation of knowledge to encompass the factors affecting demand for and use of knowledge in novel and useful ways (Hall et al., 2006). Government, the private sector, universities, and research institutions are important parts of a larger system of knowledge and interactions that allow diverse actors with varied strengths to come together to pursue broad common goals in agricultural innovation. In the systems perspective on innovation, production and exchange of (technical) knowledge and information are not the only prerequisites for innovation; several additional factors play a key role, such as policy, legislation, infrastructure, funding, and market developments (Klein Woolthuis et al., 2005; Hekkert et al., 2007). Furthermore, innovation is not only about creating economic value, but also societal, ethical, environmental and other types of value. The actors involved in the innovation system for agriculture act like flexible and dynamic networks which have been referred to as 'innovation coalitions' by Biggs and Smith (1998), 'innovation configurations' by Engel (1995), or 'public-private partnerships (PPPs)' (Spielman and Von Grebmer, 2006; Hall, 2006). In this approach, public, private and civic society actors have been included in the Innovation System for Agriculture (these actors include, for example, rural (micro) entrepreneurs such as farmers and others who develop economic activities in the rural areas, as well as researchers, consultants, policy makers, supplier and processing industries, retail outlets, customers and NGOs).

However, there is limited research on how to address each function of agriculture (economic, ecologic and social) in an efficient and effective manner. There is a substantial knowledge gap, in fact, concerning the mix of actors from Innovation System for Agriculture supporting efficiently and effectively the implementation of the different functions of agriculture. Also, very little is known about how to motivate conventional systems of production to unlock and undertake new innovation pathways (sustainability). Furthermore, more knowledge is needed on how to close gaps between the need for change and farmers' motivation to adjust, and on how to improve the capacities of innovation agencies and advisory services to effectively support changes (multifunctionality of agriculture). Nevertheless, in order to help the integration of social concerns into farming practices, the private interests of farmers and rural entrepreneurs have to be sufficiently integrated into the research agenda and into the priorities of the extension set of activities. These are only some of the reasons sustaining the need to study the Innovation Systems for Agriculture from their perspective of their capacity to act in an efficient and effective way in implementing the multiple functions of agriculture as a key to ensure the sustainable development of the farm sector.

## RESULTS AND DISCUSSIONS

The knowledge and information dissemination impact meant: emergence of farms with new activities; the formal, institutional behaviours were multiplied; the information needs were multiplied and diversified. The information process is not a segmented process, it rather develops depending on the rural community characteristics, on the innovation adoption specificity. The farmers consider that in order to be relevant and true, the information should take place in certain conditions: information dissemination should take into consideration the agricultural specificity of the zone; dissemination through modern methods; conjugated dissemination – the same information type should be disseminated through several channels.

The analyses by sociologic collections reveal a strong impact of the information process; a change in attitude and behaviour became manifest, as the information

beneficiaries became more exigent, they began to ask for information multiplication or other information types, to modify their technological or organizational practices.

The knowledge and information process should take place depending on the following requirements:

- *true identification of the farmers' information needs*, finding out the information that is truly necessary. It is quite obvious that the information type derives from the „top-bottom development” model where the information contents and format are designed by factors outside the rural community. The alternative use of modernization and development models is necessary. Under the *participatory development pattern the information should be asked for and not merely delivered, regardless of farmers' requirements / expectations*.

- *defining the target group not as a social aggregate, but rather as a sociologic entity defined by certain characteristics. As the information is addressed to farmers, and not to a “generic farmers” it should be conceived, designed, edited and transmitted only in conformity with certain beneficiaries' characteristics*.

A multiple information should take place, so as to ensure a visible impact.

Most interviewed actors in Romania define “innovation” as a *novelty* that helps to solve up an existing problem, to improve a product or a service, to increase the economic performance of a product or process, etc. In the case of governmental actors there is an overlapping between the meaning of the “*innovation*” *concept and the transfer of knowledge*. This implies that the valorisation of innovation creation process in agriculture is minimized in the case of public power and of innovation end users. The interpretations of the “innovation” concept are generally tributary to the evaluations of the benefits that the respective organizations might have if they implement the innovation process. The interpretations of the investigated actors represent instrumentalizations of the innovative process, resulting from their institutional attributes.

Generally, the potential direct beneficiaries of the knowledge transfer (farming company, farmers' cooperation cluster) and the innovation diffusers consider that it is the foreign/multinational firms/companies (agricultural input manufacturers and suppliers) that produce innovation, while also ensuring an efficient transfer of necessary knowledge for its implementation. The positive valorisation of the large foreign companies, of their significant role in knowledge transfer was mainly found in the case of farmers (farming company, farmers' cooperation cluster), of input suppliers. The same actors also valorised the market role in the process of innovation creation and knowledge transfer. *In conclusion, in Romania, the efficient system of innovation and of its transfer is based on only two actors: farmer and foreign company. There is a superficial, attenuated relation between the Romanian research and farmers, with no social and/or economic efficiency*.

The state role in innovation manufacturing and mainly in innovation transfer is positively valorised by the actors who represent the public system (research organizations and regional governmental organizations) that consider that the state has the role of mediating the innovation transfer at territorial level by facilitating the meeting between the innovation suppliers and the final beneficiaries, through fairs, exhibitions, information caravans, etc.

The interviewed persons' opinion is that both innovation and its implementation can be put into practice only by the foreign companies, and the large and medium-sized farms from Romania are the available beneficiaries (territorial government entity, farmers' cooperation cluster, farming company).

In Romania, the hierarchy of organizations/institutions that mediate the knowledge/innovation transfer is managed by the *multinational companies that manufacture and supply inputs*, followed by the *universities and research institutes, research stations* and different institutions that represent the *Ministry of Agriculture and Rural Development*: territorial entities with administrative functions (county agricultural

directorates, town halls), entities with agricultural and rural development support functions (development agencies, agricultural payments agencies, advisory agencies).

While most interviewed persons consider that the main channel for information transmission to innovators is of institutional nature, the farming companies – final beneficiaries of innovation transfer – designate two main information sources for the innovations they are implementing: *the agricultural input supply companies* and the information exchange with *other farmers who have implemented a technical or technological innovation*.

Generally, in Romania, *the knowledge transfer takes place on vertical channels, from top to bottom*, being initiated by integrators or manufacturing innovation institutions, these being doubled by the horizontal circulation of information, through communication between farmers themselves.

The hierarchy of the knowledge transfer practices is dominated by the exchange of experience closely followed by the demonstration plots, good practice models, conferences, training courses, agricultural fairs. *The main disturbing factors of the innovation transfer* differ according to the perception of interviewed actors, namely:

- *the innovation offices/agencies* consider that there are several different factors that hinder innovation transfer, namely: lack of finance, fear of novelty, lack of information, legislation, state;

- *farming company* – the disturbing elements are identified in the state institutions, financial scarcity and the non-functional relations existing between the farmers and the state in particular;

- *the research organizations, governmental entities and cooperation clusters* consider that the farm and farmer characteristics (absence of agricultural education and of vocational training, economic farm size) generate significant obstacles in the process of innovation diffusion and acceptance.

*The measures encouraging innovation* are associated to those from the National Rural Development Plan: vocational training and knowledge diffusion (M-111), modernization of agricultural holdings (M-121) and supporting semi-subsistence agricultural holdings (M-141). Knowing these measures denotes that the actors become aware of the possibilities provided by the state institutions, on one hand, and of the limited support provided by the public programs for agricultural and rural innovation, on the other hand. In the hierarchisation of the desirable means for the improvement of the innovation/knowledge transfer, the investigated actors from Romania count on the *governmental institutions* (public power) assuming the innovation promoting role in the first place. The second pillar of encouraging AKIS operation in Romania is the *crediting system*, followed by *cooperation* and the *knowledge and information base*. In this context, the tender system is evaluated as a tool with low innovative value by the interviewed Romanian actors.

The increase of innovation acceptance and of the knowledge transfer efficiency is associated to farm physical size:

- for the *low-sized farms*, most opinions focus on the bi-dimensional idea: financial and technical state support and establishment/modernization of associative forms. There is a noticeable dual perception that combines the traditional perspective (the paternalist state that has to create multiple support through capital infusion, technical assistance, and support to training/information) with a modern perspective (emergence and development of associative forms benefitting the increase of innovation capacity and knowledge transfer).

- for the *large-sized farms*, the diversity of the modalities to increase the innovation capacity and the acceptance of the innovative products flow is much higher and targets the entire process of innovation transfer and implementation. The association with production

functions between farmers is considered as a reliable modality to increase innovation acceptance by most interviewed persons. It is also worth mentioning the opinion according to which the large-sized farmers should be *stimulated, encouraged* (by fiscal facilities and access to EU funds inclusively) in the design of *medium- and long-term investment strategies* that should include *vertically integrated development projects (production – processing – sale)*.

- for the *cooperation forms* the factors increasing the innovation capacity are external to the organizational structures, being represented, in the Romanian interviewed persons' opinion, by the logistic and financial support and by mutual interest.

It is obvious that in Romania, the tools by which the innovation capacity and the knowledge diffusion network efficiency can be increased are perceived as being an attribute of the state, on one hand; on the other hand, they are perceived as being the result of the associative process, which is stimulated and supported by the state.

## CONCLUSIONS

Generally, in Romania, *the knowledge transfer takes place on vertical channels, from top to bottom*, being initiated by integrators or manufacturing innovation institutions, these being doubled by the horizontal circulation of information, through communication between farmers themselves.

The potential direct beneficiaries of innovation (farming company, farmers' cooperation cluster) and the innovation diffusers generally consider that it is the foreign/multinational firms/companies (agricultural input manufacturers and suppliers) that produce innovation, while also ensuring the efficient transfer of necessary knowledge for its implementation. The same actors also valorised the role of the market in the process of innovation creation. Similarly, the interviewees (territorial government entity, farmers' cooperation cluster, farming company) also believe that innovation and its implementation can be put into practice only by foreign companies, and that the large and medium-sized farms in Romania are the beneficiaries.

Knowledge transfer in Romania is deficient for the following reasons:

- *Lack of continuity*: foreign companies that have left the country (farming company's opinion);
- *Lack of consistency*: it is sporadic and unorganised (farmers' cooperation cluster's opinion);
- *There is no adequate vocational training*: deficiencies of the vocational training process and of continuous education programmes (research organisation's opinion);
- *Lack of efficient communication*: insufficient information/knowledge, inadequate to address real needs (opinion of input suppliers, farmers' cooperation cluster).

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