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## **INNOVATIONS IN RURAL SPACE: FROM MODERNISATION TO NETWORK INNOVATIONS**

### **Abstract**

The process of globalization has fundamentally changed the significance of innovations in the development of rural areas. The modernisation paradigm in agriculture has been replaced by the post-productivist regime, which means a change of the innovation order. The linear diffusion of the innovation model is being replaced by a network, endogenous model. The former concentrated on adaptation of innovations and operated at the macro-social level; the latter focuses on processes of social learning of innovation and on the creation of hybrid social networks at the micro-social level. In the modernisation paradigm, innovations were created outside of the agricultural sector. In the endogenous model, the significance of social innovation and participation of different social actors are crucial. The main purpose of the paper is to analyse how the new network model of innovation is being creating and what groups of social actors participate in the process of change.

### **Key words**

post-productivist paradigm, territorial frame of innovations, linear innovation model, network innovation model, rural development, social innovations

### **Introduction**

The question formulated in the title emphasizes changes in the innovation model in rural development processes, indicating changes from the linear to the network model of innovations. Innovations are necessary for the stimulation of development processes. This pertains also to the development of the food economy and of rural areas, which developed in the past their own, autonomous innovation system. This situation was caused by the lack of interest on the part of institutions that implement innovation in the transfer of technologies to agriculture and in the modernisation of rural areas. The policy of the state supported rural development and modernisation projects and financed agricultural innovations taken from the broader social surrounding.

The changes observed in the social context of agricultural innovations, caused by population growth and escalated urbanization processes [1], require an integrated approach to agricultural innovations and a redefinition of the term "agricultural innovation system," which was hitherto identified with "agricultural extension". In the 1980s, the paradigm tying innovation to technology was subjected to criticism and replaced by a participation paradigm involving farmers in cooperation with experts. A report from the World Bank, an institution important for supporting the diffusion of rural innovation processes, names six structural changes redefining the social context for innovation in agriculture. They are as follows:

1. Markets, not production, increasingly drive agricultural development.
2. The production, trade, and consumption environment for agriculture and agricultural products is becoming more dynamic and evolving in unpredictable ways.
3. Knowledge, information, and technology is increasingly generated, diffused, and applied through the private sector.
4. Exponential growth in information and communications technology has transformed the ability to take advantage of knowledge developed for other purposes.
5. The knowledge structure of the agricultural sector in many countries is changing markedly.
6. Agricultural development increasingly takes place in a globalized setting" [2].

Structural changes need social innovations, which are crucial for social participation, information and knowledge exchange. It is observed that innovations may create positive externalities and be an instrument preventing negative externalities, such as environmental pollution in agricultural production and food economy [3: 11]. In rural development discourse, social aspects and problems become the centre of interest. The focus is

on social innovations which are of key importance for solving rural development problems observed in regions with aging populations and declining agriculture. This requires new ideas and solutions that technical innovations do not offer. Similarly, one could find new solutions to urban problems, such as unemployment and obesity, if one made use of the agricultural advisory services experience. This would make it possible to construct new patterns of rural-urban relations.

The problems of food safety and health hazards have become the heart of public debate, which has affected CAP (Common Agricultural Policy) reform. The European Commission has published numerous reports [1, 3] analysing the system of innovations and agricultural knowledge. The reports document a need to introduce changes and describe what these changes should consist of.

The purpose of this paper is to describe how a new model of innovation is being created and what social actors participate in it.

### **Conceptual Framework**

The previous linear agricultural innovation model, oriented mainly towards agricultural production increase, does not satisfy the needs of contemporary farmers and does not provide a solution to the challenges of sustainable development of rural areas. In the discourse on rural development, one observes a change of the paradigm and a turn from the modernisation paradigm towards sustainable and multifunctional development. This results in the formulation of new social expectations towards agriculture, which should not only feed the growing population, but should also reduce the adverse impact on the natural environment. Smart, sustainable and inclusive growth requires a new network innovation model and a greater focus on social innovations. Due to the complexity of agricultural innovations, new mechanisms that could stimulate development thereof are required, and such mechanisms are provided by hybrid social networks.

Institutional changes caused by the application of new technologies [3: 21] contributed in the 1980s towards the popularisation of the term “social innovations”. Social institutions change very slowly, since some stakeholders are interested in performing their routine functions and in maintaining the *status quo*. Technical innovations do not solve these problems. The new, endogenous approach to innovations requires the mobilization of local resources and capacity building. The CAP reform and the cross-compliance rules introduced in the EU make access to agricultural subsidies dependent on the implementation of good practices for the benefit of the environment, animal welfare and quality of rural life. This includes the attainment of objectives connected with rural development and the production of public goods, and not only an increase in agricultural production.

As Bettina Bock contended, the notion of social innovation was created as a result of criticism of the traditional understanding of innovation, which was limited to technology, goods, scientific knowledge and economic viability [3: 47; 4]. In the context of rural development, it includes social objectives, which are necessary and desirable to assure the survival of rural communities and meet the challenges of sustainability. However, the notion of social innovations, although commonly used in the context of rural development, is polysemantic and contains a certain normative meaning. The situation is much simpler when one speaks of the development of agriculture, where one still uses the notion of technical innovations referring to product and process innovations. Rural development leads to changes in the social and socio-economic system and is connected with profound social changes [3: 52].

The term “social” in the context of innovations is interpreted as:

- “- the social mechanisms of innovations,
- the social responsibility of innovations, and
- the innovation of society” [4: 57].

Referring to the notion of social innovations, one often emphasizes their links to social inclusion, social cohesion and social capital. The following, often cited in the literature, defines social innovations formulated by the Center for Social Innovation at Stanford University, and may serve as an example of the above, as it names and accentuates these social effects of innovation:

“Any novel and useful solution to a social need or problem, that is better than existing approaches (i.e., more effective, efficient, sustainable, or just) and for which the value created (benefits) accrues primarily to society as a whole rather than private individuals” [5].

Social innovations are defined in a similar manner in EU documents.

### From the linear towards an integrated network innovation approach

The postulate of constructing networks and strengthening interactions in education-research-innovations triangle [3: 14] has been included in the EU modernisation agenda. This problem is as complex as the modernisation of agriculture used to be, and therefore requires an interdisciplinary approach.

The main differences between the linear and network integrated innovation models are presented in Table 1.

Table 1. Two views on innovation policy

	Mainstream macro-economics	Institutional and evolutionary economic systems of innovations
Main assumptions	Equilibrium Perfect formation	Disequilibrium Asymmetric information
Focus	Allocation of resources for invention individuals	Interaction in innovation processes Networks and frame conditions
Main policy	Science/Research policy	Innovations policy
Main rationale	Market failure	Systemic problems
Government intervenes to	- provide public good - mitigate externalities - reduces barriers to entry - eliminate inefficient market structures	- solve problems in the systems - facilitate creation of new systems - facilitate transition and avoid lock-in - induce changes in the supporting structure for innovation: create institutions and support networking
Main strengths of policies designed under this paradigm	Clarity and simplicity Analysis based on long-term trends of science-based indicators	Context specific involvement of all policies related to innovation
Main weaknesses of policies designed under this paradigm	Linear model of innovation (institutional) framework conditions are not explicitly considered	Difficult to implement Lack of indicators for analysis and evaluation policy

Source: Ruud Smits, Stefan Kuhlmann and David Shapiro: *The Theory and Practice of Innovation Policy*, 2010, in: [3: 15] [4]

As presented in the Table 1, both models stress different mechanisms and groups of social actors involved in innovation processes. A reference to social mechanisms in the integrated network model emphasizes the involvement of various actors in solving rural development questions, i.e. those already at the stage of creating innovations, and not only at the stage of their diffusion. It is common knowledge that innovations are firmly rooted in culture and social relations, which is well illustrated by the term socio-technical innovations that emphasizes the inseparability of these two aspects [7]. The social responsibility of innovations involves preventing market failures, the satisfaction of social needs and making assessments with respect to the winners and losers of innovation. This is particularly important in the context of rural development, since certain technical innovations which are profitable for farmers, such as GMOs, are harmful to the natural environment and encounter social resistance. Sustainable development requires socially accepted innovations which are beneficial for the planet, and not only profitable to a small group of producers [8, 9]. Solving many social questions in which social innovations can be used would mean profound changes in values, behaviours and action patterns, which can be accomplished only if rural development processes are accepted and not met with social resistance.

As Bock pointed out: “The construction and introduction of new technologies always involves changes in the interaction of ‘things’ (artefacts), actors and ‘ways of doing’ (institutions) and affects and is affected by how society is organised and functions” [4: 58].

### **Process of Creation and the Essence of the Network Model**

In the 1960s, advisory services and academics used the term agricultural knowledge system (AKS) to organize and illustrate the relations shaped in accordance with the linear innovation model – from science towards practice [3: 23]. Scientific research in the field of agricultural studies was conducted to modernize agriculture, and at that time it was the principal objective of the interventionist agricultural policy. Many European countries developed a closely interconnected system of public scientific institutions and extension services, laying the groundwork for cooperation under the direction of the ministry of agriculture. In the 1970s, institutions such as OECD and FAO supplemented the term adding an “I”, which initially stood for “information”. Subsequently, “information” was replaced by “innovation” and thus the term agricultural knowledge and innovation system (AKIS) was coined [3]. This was not only a change of name. It reflected a wider scope of transformations taking place in agriculture, the organization of education, extension services and market liberalisation. It illustrated changes in the linear innovation model and its replacement with the participative network model. The network model makes it possible to include all stakeholders, and to create networks and an integrated innovation model. Such a change was also fostered by the privatisation of extension services, farmers’ participation in the costs of using these services, as well as by environmental objectives and the problems of life and work quality of rural dwellers becoming points of interest of rural development policy.

Agricultural policy began to support the positive externalities of agriculture, which were questioned with respect to industrial agriculture. It caused a discrepancy between a farmer’s knowledge and the knowledge offered by science and extension services.

A generally recognized formal definition of AKIS is “a set of agricultural organizations and/or persons, and the links and interactions between them, engaged in the generation, transformation, transmission, storage, retrieval, integration, diffusion and utilization of knowledge and information, with the purpose of working synergistically to support decision making, problem solving and innovation in agriculture” [9 in 3: 23]. It can be noticed that this definition relies on a sectoral approach, making use of the term “agriculture”. In a more recent report [3: 24], the term “rural” was already used, which may be interpreted as a broadening of the understanding of the term “innovations”. This is connected with the acceptance of a territorial perspective in studies on innovations in rural spaces and with accentuating social purposes. It is emphasized that this is a sign of the rejection of the linear innovation model [3, 4, 8] and of the emergence of the network paradigm, which better reflects the challenges of sustainable development.

In the network paradigm, the group of actor-participants of the innovation process is expanded to include both individual as well as collective actors from outside science and advisory services. Farmers, NGOs, public and local government officers, as well as entrepreneurs act in support of sustainable rural development. New groups of actors bring different interests, objectives, values and expectations into the network. Interactions and relations between the participants of this process are of key importance for information exchange and innovation learning. Currently, innovations are not only narrowly understood productivist objectives, but are also used to implement public goals. Their creation and diffusion are decided by financing mechanisms, institutional infrastructure, social networks and market structure. Social networks may have various structures and may focus on local, state or global networks. The term *LINSA (Learning and Innovation Networks for Sustainable Agriculture)* describes the networks, coalitions for innovations, configurations, and Private-Public Partnerships [3: 25]. The network innovation model emphasises social creation and knowledge sharing between various actors, which makes it possible for previously marginalized, niche actors to be included in the networks. In addition, various rural development support systems, such as banks and institutions that finance and pursue rural development policy, as well as producers’ associations, have also been included in the network. Although this causes problems with coordinating operations, it also allows for the creation of innovations.

The learning process is vital for obtaining of satisfactory results and can take various forms, including imitation and joint activities.

Changing the innovation model means broadening the notion of innovation and including social, organizational and marketing innovations. Actions covered can be undertaken in various spheres of social and economic life and are not limited to the sphere of agricultural production and services. Public discourse has been enhanced by new notions exceeding the previous discourse frames, such as food safety, public health, alternative food production and distribution networks, and the vulnerability of global markets.

### **Social innovations as a rural development driver**

Shaping a new innovation model reinforced the connection between rural development and social innovations, and new factors decisive for their diffusion appeared. As researchers assert [see 10: 37], previous work on this topic looked to answer what social innovations were, paying less attention to the determinants of their diffusion, involvement of social actors and the meaning of social innovations in rural development processes. More recent papers discuss these issues [10, 11, 12] and indicate the connection between social innovations and rural development. This connection consists of the building, activation and use of endogenous resources, which can be used to solve social problems found in a given region, to improve the living conditions of rural dwellers, and to cause positive social effects which will be beneficial for the entire community, and not only for selected individuals. The development of cooperation and social networks empowers endogenous social resources. According to Neumeier, indispensable conditions of a successful social innovation are:

- “1. it is innovative with regard to the user, context or application;
2. it meets needs more effectively than pre-existing alternatives;
3. it provides long-term solutions; and
4. it is adopted beyond the initial group/network that developed it” [10: 35].

As follows from the above, whether a new solution is successful is decided both by its novelty as well as its diffusion and the scope of its impact, which depend on collective learning, communication and coordination processes. Thanks to these processes, new social actors participating in rural development processes, located both in the rural space and beyond, are included in the cooperation network.

Reviewing the literature enables us to isolate three kinds of factors decisive for social innovations being successful [10: 37]. They include factors decisive for the course of the innovation process isolated by Rogers [13], such as the exchange of information between various actors and the perception of innovation subjectively defined as a novelty. The second group comprises factors determining the actor network manoeuvre space outside of the innovation process. These factors shape structural capabilities and limitations resulting from the social context, culture, legal system and organizational structure. They may be conducive for rural development or be a source of barriers. Factors rendering social innovations successful are described more often than barriers [10: 38]. Overcoming these barriers requires the participation of institutions managing rural development processes in networks and making use of past experience of collective efforts. If there is no such experience, it is difficult to initiate the process of innovation. The third group of factors include those that affect the actual participation process. The factors described are inter-related, and it is not always possible to separate them.

Another important component is the social diversification of the innovation recipients, i.e. farmers and rural dwellers, with respect to such socio-demographic variables such as gender, age, relationship to agriculture – professional (main source of income) or hobby (a life style element), and the character of agricultural practices – conventional, organic, sustainable. Categories of farmers demonstrate different attitudes towards innovations and have various access to the system of innovations. Innovation support is most often dedicated to large, intensive farms and designed in such a manner that other farmers are excluded from the system [3: 30], since state institutions are not interested in supporting them.

As Neumeier contends: “at an individual, community and regional level, social innovations are at the core of neo-endogenous rural development and as such an important prerequisite for its success” [10: 37].

The progress of the diffusion of innovations process also depends on the type of innovations. The Oslo-Manual, a frequently cited source, names four types of innovations: product innovations, process innovations, marketing innovations and organizational innovations [14: 31-35].

Social innovations that are the subject of this paper could be classified as organizational innovations, but the remaining types of innovations connected with the rural areas economy, both with the agricultural production sector, as well as with the area of the developing services economy, are also important for rural development. Changing the context of agricultural innovations and forming a new innovation order have been described by Brunori and collaborators [11]. They highlighted the role of regulations introduced on the food market and the values of consumers to which farmers react.

### Conclusions

Treating social innovations as a panacea to all rural development issues is problematic [15]. A single social innovation can be successful, but its social effects could be unexpected. The success of social innovations in rural development, as pointed out by Neumeier [10], depends on many factors external and internal to rural areas. Internal factors, such as the commitment and creativity of rural communities, are incapable of being controlled by external institutions. This results in a sceptical assessment of the potential of rural policy with respect to the intentional initiation or steering of rural social innovation process, although it is capable of creating space for actions of various actors involved in innovation networks. Social innovations have different social effects in regions rich with resources where they can be conducive for creating new resources and mobilising internal development potentials. In such regions, social innovations increase the adaptation capabilities and provide new development opportunities. Social innovations will, however, have different consequences in peripheral and marginalized regions where they can prove to be too weak of an impulse to foster development. Many rural regions are poor in internal resources, so it is hard to believe that social innovations and a new network model of innovations will be effective. A strong dependence on the social context shows how difficult it is to formulate general recommendations with respect to the better use of social innovations in the processes of rural development.

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