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INNOVATION-BASED RURAL DEVELOPMENT

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ABSTRACT
Innovation-Based Rural Development
The main changes in rural development result from the newly defined rural development goals, which are the result of focusing on the space and not so much on the agricultural sector alone. In the transition countries, innovation is of key importance, not only at entrepreneurial and production levels but also at organisational, motivational and leadership levels. Technological changes and implementation of new communication technologies have been the major driving force for developing the rural area as an integrated space. Development initiatives are generated in the local environment. Initiatives are being interconnected, including policies by different economic sectors at a multi-institutional level. The crucial requirements for success are: innovations, flexibility, competences, efficiency and synergy, which lead to a deviation from unilateral sectorial dependency to broad inter-sectorial cooperation and an integrated approach. The capacity of regions to support learning and innovation processes is a key source of competitive advantages. Human capital is essential driver of rural innovation. Innovation is not merely about technology – it is about change in human behaviour.

KEY WORDS
innovative rural region, integrated space, flexibility, lifelong learning, efficiency, synergy

1. Introduction

"Innovation is the ability to see change as an opportunity – not a threat."
Albert Einstein

In the article, the author presents the importance of innovation for agricultural and rural development. Agriculture and innovations are related ever since agriculture was invented.Through time, innovations, in addition to natural resources and access to natural resources, had a decisive influence on agriculture and rural development. Working with nature, people knew that mutating weeds and pests would win the battle when innovation faltered (EU SCAR, 2012).Innovations in soil cultivation and production, selection and protection of products, and management of climatic conditions (irrigation) led to agricultural products surpluses. Innovations generated diversification of local and regional economies. Goods exchange and trade among tribes emerged and accelerated the development of traffic, the construction of roads and means of transportation.Innovations in agriculture and rural enterprise happened by chance and through the informal but purposive actions of rural people seeking new and better ways of production and organisation. Rural people themselves, therefore, have been a major source of new knowledge and practices – indigenous knowledge and organisation (Poole and Penrose Buckley, 2006).In the last century, agricultural innovation has been professionalised in outsourcing these activities to universities and state activities in applied research and extension (advice), and to professional companies (such as breeders and equipment suppliers). The social return of these activities has been enormous and often far above market rates for investments (Alston,2010;EU SCAR, 2012).

After World War II, the distinction between basic research and applied research became increasingly important (EU SCAR, 2012). This division of labour was also linked with a linear model in the chain from basic knowledge to innovation, be it "science-push" or (later) "demand-pull". This picture was of course an oversimplification, but supported by the social sciences (Smits et al., 2010). During the 1950s and 1960s, much emphasis was placed on encouraging farmers to operate more efficiently and effectively and on encouraging private sector investment in agriculture. This period saw dramatic technological changes in the land-based industries. Mechanisation was followed by the application of new agrochemical technologies. These technological changes profoundly altered the nature of farm work, cropping and husbandry practices and patterns of agricultural land use. They were highly orchestrated by the state through publicly funded agricultural science and R&D and a state-funded agricultural advisory service, as well as grants and subsidies to "oil the wheels" of change (Mahroum et al., 2007).

The process of de-industrialization began in the middle of the 20th century in the United States and in the 1670s and 1980s in the developed European economies.Bryden (2000) notes that considerable changes occurred in forms, content and management of agricultural policies in many EU and other OECD countries during the 1980s and 1990s. We witnessed the restructuring of production activities and new problem solving approaches. Only after EU expansion in the Mediterranean area, significant differences in agricultural development among regions in the EU revealed (Bryden, 2000). It was important to consider regional specificities to be able to solve problems.Former agricultural policy was the targeted, sectorial one, as its main goal was to increase the production. Developed non-European countries (G20, Cairns group, developing countries) criticised European agricultural policy and demanded the closure of production-oriented refunds for the agricultural sector.

New rural development paradigm was formed in the past decades, based on examples of good practices and changes, both in the economic and geopolitical areas. The main changes result from the newly defined rural development goals, which are the result of focusing on the space and not so much on the agricultural sector alone. The main tools to achieve these goals are investments rather than the refunds. The paradigm defines approaches to tackle challenges faced by the rural areas and is based on searching for possibilities resulting from unused potentials at regional and local levels. Common Agricultural Policy (CAP) presents a key legislative basis in the context of which the means for more balanced development of country and rural regions in the enlarged European Union are systemically provided.The CAP has moved away from price support and market interventions towards payments for delivering environmental objectives through agri-environmental schemes. These reforms have stimulated new innovations in land-based industries by opening up agriculture to international market pressures, leading to an increasing emphasis on the quality rather than the quantity of food produced (Mahroum et al., 2007; Europe 2020; Horizon 2020; CAP after 2013).Innovationthen appears as an initiative of the local actors whobring a new solution to the specific challenges the area faces. This is why understanding the nature of the innovation in rural areas is greatly facilitated by the careful and systematic analysis of the practices of the local actors themselves (Farrell et al.,1997).

For transition countries, including Slovenia, we find that the agricultural sector was in the position of economic inferiority until the period of the social changes at the end of the 1980s. The industrialization was at the forefront, and rural areas underwentdeagrarisation, which resulted in depopulation and aging of rural population.The reason for this lies in the fact that before transition, agriculture was managed in a planned manner.

Private farms were small in size and did not receive public assistance for their development, while every attempt at entrepreneurial approach was disabled by barriers, both in the form of allowed size of private farms and limited access to mechanisation. State policy supported development of socially-owned holdings which were large agricultural holdings with specialised, sustainably focused production. Due to the manner of managing them, they were inefficient and their productivity was low.

They monopolised the market and were not exposed to market competition, as the agricultural product prices were regulated and food import was under state control in both respects, quality- and quantity-wise. Only with the transition to a market economy and with the new rural development paradigm, positive development trends, which are comparable to those in developed countries, have taken place in rural areas.

2. Innovation in the context of diversification of rural development

"Innovation is a product, service or process that is new for a certain locality and can serve better to satisfy the needs of the community and support sustainable development."
Valdis Kudins, Latvian Rural Forum

Definitions of the agricultural knowledge system (AKS) have changed over time, with changing ideas about agriculture. There is a history of changing visions of the AKS and policies towardsthe AKS. Leeuwis and Van den Ban (2004) claim that the AKS concept originated in the 1960s, driven by an interventionist agricultural policy that sought to coordinate knowledge and innovation transfer in order to accelerate agricultural modernization. In many countries, this concept was implemented through a strong integration, generally at national level, of public research, education and extension bodies, in many cases under the control of the Ministry of Agriculture. Since the 1970s, official organizations such as the OECD and the FAO haveintroduced the concept of "agricultural knowledge and information systems" (AKIS) in policy discourses (EU SCAR, 2012).

The traditional science-based, linear approach to recognising and measuring innovation does not recognise the breadth of innovation that may take place in rural areas and thus a broader definition is required. Innovation in rural areas may be much wider than product innovation, and may incorporate new ways of living, travelling, working and collaborating. Rural innovation may be about different ways of working – perhaps using technology – or of encouraging human capital development.

It may involve new forms of collaboration – for example, drawing together land-based, retail and tourism businesses into networks, or new relationships formed among producers, retailers andconsumers – which can create considerable value for the local economy (Mahroum et al.,2007).Drabenstott and Henderson (2006) propose two key ingredients for a rural development strategy: (1) the twin forces of innovation and entrepreneurship and (2) a critical mass of human, financial and social capital to support evolving innovative and entrepreneurial activity.

In the transition countries without proper entrepreneurial tradition innovation is crucial not only at entrepreneurial and production levels but also at organisational, motivational and leadership levels. Studying regional development problems of Podravje (Lorber, 2005) we noted that exogenous development model did not develop cooperation between local and national partners when forming regional policy and also neglected the importance of activating own innovative potentials and development initiatives. It also neglected the large potentials for interregional cooperation and building a recognisable regional identity (Lorber and Žiberna, 2014).

Innovation is a contemporary factor in assuring regional competitiveness. On the global market, the differences in production costs of basic products are so large that finding new, similar product rather than competing on the old one is essential. The New Rural Paradigm, which is of vital importance in land use and rural development changes, suggests that local people will have to drive this process;the national, regional and rural governments will play a major role in supporting this bottom-up development effort (OECD, 2012;Voutilainen and Wuori, 2012).

3. Creative rural solutions and innovative methods

Creative rural solutions and innovative methods are also being encouraged through the EU's Recovery Package, which has been introduced to deal with the global economic crisis. Innovation is the key concept of the LEADER Community Initiative which aims to "support innovative, demonstrativeand transferable operations illustrating the new paths thatrural development could follow". Since the launch of the second phase of the Initiative, many local action groups (LAGs) and other collective actors have been looking at the "innovative" dimension of the action they are backing or implementing, and in some cases even reflecting on what innovation actually means. It is not easy to identify the innovative nature of a rural development action; this depends on the geographical, economic, social, cultural, etc. situation of the area (Farrell et al.,1997).

Willingness to work in a new way with a holistic approach, the identification and application of new ideas and techniques and search for a broad consensus among stakeholders of different sectors of the economy are extremely important. These types of innovative action are often facilitated by knowledge transfer among regions (Lorber, 2003).

Actors in an agricultural innovation system (AIS) innovate not in isolation, but through interacting with other actors − farmers, firms, farmer organizations, researchers, financial institutions and public organizations − and the socioeconomic environment. In other words, agricultural innovation is an organizational phenomenon influenced by individual and collective behaviours, capabilities for innovation and enabling conditions. Interaction, coordination and collective action are based above all on the actors' capacity to identify opportunities for innovation, assess the challenges involved, and access the social, human and capital resources required for innovating, learning and sharing information (World Bank, 2012).

4. Innovation in the context of changes - from specialisation to diversification of local economies

"Innovation is searching, finding and sharing."
Rob Janmaat, Netherlands Rural Network

Knowledge is now recognised as a key ingredient underlying the competitiveness of regions, nations, sectors and firms. At its most fundamental level, the knowledge-base of an economy can be defined as the capacity and capability to create and innovate new ideas, thoughts, processes and products, and to translate these into economic value and wealth (Huggins and Izushi, 2007).

The old paradigm of agricultural development was intended to reduce disparities, increase agricultural income and enlarge competitiveness in agricultural production. It was largely targeted at the agricultural sector.The accomplishment of these objectives was characterized by the top-down approach. Agriculture depended on the external factors, which decided on the amount and purposeof the use of refunds. Often the effects of the refunds showed up more as obstacles than actual development promoters. The consequences of intensive agricultural production were large specialization and hyper production.Social changes and EU enlargement effected the changes in the new common market. The presence of cheap labour and/or energy changed locational factors of the rural area within the EU. Companies looking for this type of comparative advantage relocate outside the Union.

Within new development perspectives of agricultural development new objectives have been created. Thus, the goal of reducing disparities has been replaced by the goal of creating a competitive rural area as a whole.Special attention has been given to identify local strengths and to use untapped resources. Extended objective concentrated on the comprehensive space − the countryside.Agricultural sector is no longer crucial in rural development, in the foreground arenow interrelated various sectors of economic activities related to agriculture and rural areas, including rural tourism, recreational activities, production activities, and information and communication technologies. The key to achieve development goals are investments both in infrastructure and in new forms of economic activities, including supplementary activities of individual agricultural holdings.

5. New interactions between the local context and global context

"In the context of globalisation, innovation is a must for all regions, whether rural or not."
Angel Gurria, Secretary General, OECD

The global context generally presents a dilemma for rural areas. New opportunitiesfor the development are not always easy to detect. The lack of reaction to the new constraints that appear may have a domino effect and lead to a weakening of the area's identity, a decline in its population, a deterioration of local services, etc., as has already occurred in many rural areas (Farrell et al., 1997).

Until the 1970s, a number of rural areas were still relatively isolated; today, a series of factors is encouraging and increases opening to the outside world. The construction of the European Union and the establishment and strengthening of the Single Market ended the isolation experienced by certain regions. The construction of transport infrastructure in the middle of the second half of the 20th century caused better transport accessibility. The fall of the Iron Curtain and socio-economic changes in emerging countries in transition enabled isolated rural regions to enter the common EU market.

New information and communication technologies enabled direct connections among individuals, businesses, areas and distant markets. New information systems and establishment of broadband communication networks made it possible for individuals and businesses to access necessary information, establish e-sales and e-marketing, so they can make the most of the market niches. Advancedcommunication systems and transportation infrastructure encourage businesses to find space and lower rents, and locate in rural areas.

6. The development of new internal synergies

"Creativity and innovation can help decrease bureaucratic burden and increase bottom-up approaches."
Marie Trantinova, Czech Republic

Success of investments is conditioned by the use of natural and cultural potentials of local communities and is largely dependent on human capital. Therefore, the concern for lifelong education is a fundamental need. With an interdisciplinary and holistic approach at all levels of management different local stakeholders, both public and private, including non-governmental organizations and citizens' initiatives, may achieve internal synergy in the implementation of new development opportunities and demands.The new rural development paradigm enables the development of high quality local products and ancillary activities on farms, connecting of producers, and joint marketing and presence in new markets.

Investments in infrastructure, access to broadband networks andfavourable land prices attract small businesses, which create new employment opportunities. CAP encourages the transfer of ownership of farms to younger family members.All these measures have beneficial effects on innovative activity in rural areas at all levels, from individuals to the local authorities with an interdisciplinary Quadruple Helix approach.

In some regions, the current economic and social crisis is leading rural populations to seek alternative solutions to the problem of underemployment and unemployment, other than exodus to the city or emigration. Young people are finding less and less work in towns where the cost of living is, moreover, high. The European Union and the Member States find themselves faced with the stagnation of public budgets, which leads to a better evaluation of the impact of the use of public funds, to the possible management of these funds in conjunction with other private or voluntary partners, to the reduction of the considerable investments and, as a result, to the promotion of smaller projects.

In the same way, the disengagement of a certain number of respected activities that before were public responsibilities initially caused certain services to disappear. Gradually, an adjustment was made, leaving more scope and possibilities for local actors to take the initiative to manage domains traditionally covered by the public sector (health, education, population services, etc.).

7. Conclusions

For transition countries, including Slovenia, it is typical that rural innovations in the past might be characterized as innovations more by necessity than by opportunity. Innovation in rural development relies heavily on the skills, motivation and ideas of rural people. There is ample evidence that rural people are very creative and/or innovative, despite the common paradigm that to possess these skills one must be educated. Therefore, we should shift paradigms and ask what we can learn from the rural experience. As we have shown above, we can learn a lot, notably from rural populations' capacity to innovate, stimulate economic development and improve the quality of life in the countryside.

Technology is bringing unprecedented changes in rural areas. There are four main categories of technologies affecting rural areas, sometimes positively, sometimes also negatively: transportation technology, geographical information systems (GIS), computational technology, and information and communications technology (OECD, 2007).

Over the last two decades, growth policies at the EU level have been formulated to encourage research, innovation and knowledge transfer. This has also been the strategy to obtain economic growth in the rural regions of Europe. The Europe 2020 strategy is a formalization of existing research with this focus and, among other things, points to the importance of embeddedness, relatedness, and connectivity as preconditions for attaining economic development and convergence among regions in Europe (Naldi et al., 2015).

Innovation in a rural setting differs from the pattern observed in urban environments. It is therefore not surprising to see rural innovation in agriculture, and that innovation continues, with the forms of agriculture arising now designed to produce high-quality products or to reconnect farmers and urban dwellers in "community supported agriculture". Rural communities are changing, adapting, innovating, inventing new rural forms and emerging as multifaceted ruralities (Jean, 2014).

The success of further, innovation-based, Slovenian rural development will depend on rejuvenation of ownership structure of farms (from 2007 to 2013,< 45 year + 8 % and > 55 year – 9 %, SORS,2017) and intergenerational cooperation. In this process, wider community investment in infrastructure construction, focusing on the proliferation of broadband connections, will play a major role (the number of agricultural holdings using computers for managing agricultural production increased by ten times in the last ten years: from 1% in 2000 to 10% in 2010)(SORS,2012).

Implementation of the CAP and the Europe 2020 agenda is closely related to lifelong educationand is a prerequisite for the success of rural development. In 2010, 64% (2000, 84%) of family farms were managed by managers without formal agricultural education (they had only practical experience in farming), and 27% (2000, 8%) of managers had only courses in agriculture, but no formal education (SORS, 2012). Promoting individual entrepreneurial mindset, which by basic definition means identifying any need and its fulfilment, leads to openness to innovation, the dissemination of knowledge, experience and cooperation. Business-oriented knowledge institutions depend on individuals and their innovative approaches. Progress can only be achieved through permanent education and by following scientific and practical experiences, comparable to those in more developed environments. An upgrade of learning and research contents at all levels of education is needed.

Stimulation of entrepreneurship, inter-sectorial partnership and active role of educational institutions will connect the urban and rural area and reverse the trend of depopulation and unfavourable age structure of rural environments.The positive results of introducing the new common agricultural policy in Slovenia are the changes in average size of agricultural holdings (2000- 5,6 ha; 2015 - 6,8 ha). The number of middle-size and large agricultural holdings is increasing. Introduction of knowledge, innovations and new forms of farming helps to improve the quality and the quantity of the products (number of eco farms in 2000 – 333; 2010 – 2218 and 2015 – 3.417). At the same time, farms are becoming multifunctional and are introducing additional, non-farming activities (http://www.turisticnekmetije.si/en/), which increases their income and affects improvement of living conditions in the rural area (share of agriculture in Slovenian GDP: 2010 – 1,7% and 2015 – 2,1 %).

The crisis in other economic sectors in urban centres affects the migration of population to the rural areas, primarily those with formed infrastructure and good accessibility to urban centres. The conditions vary from one municipality to another. Municipalities which have adapted to changes and were able to take advantage of their human capital as well as their natural resources, experienced fewer negative demographic changes, which also reflected in their respective land use, development and integration between sectors and improved public services. The problems obstructing faster development of Slovenian rural areas are: lack of adequate knowledge, lack of examples of good practice and lack of political will. When it comes to knowledge, the most problematic issue is the insufficient role of geographers and lack of their inclusion in local action groups, which are one of the important instruments to implementing the common European agricultural policy.

The future in sustainable development of Slovenian rural areas lies in development of autonomous development perspectives and discovering domestic potential as well as in integrating with other regions. In the open-market system, rural areas with unfavourable production structures are faced with international competition. They can improve their competitiveness by producing high quality agricultural crops and products, using adequate marketing strategies and by rediscovering the multifunctionality of agriculture – ecologic- and organic food production. Sustainable rural development is enabled by returning to old, environment-friendly production- and processing technologies. Obtaining these goals requires support to regional education centres. Further education and promotion of entrepreneurial mind-set will help increase the proportion of pluriactivity and diversification of family farms. Further reduction in number of farms and increase in average farm size will, along with higher productivity, form a basis for subsequent rural development.

6.References

Alston, J. 2010: The Benefits from Agricultural Research and Development, Innovation, and Productivity Growth, *OECD Food, Agriculture and Fisheries Working Papers,* No.31, Paris

Bryden, J.M. 2000: Is there a New Rural Policy?*International Conference on European Rural Policy at the Crossoads.* University of Aberdeen, Kings College.http://scholar.google.si/scholar?q=john+m+bryden+is+there+a+new+rural+polocy&btnG=&hl=sl&as_sdt=0%2C5.

Drabenstott, M., Henderson, J. 2006): A New Rural Economy: A New Role for Public Policy.*Center for the Study of Rural America*.
http://www.kansascityfed.org/publicat/mse/MSE_4_06.pdf.

Farrell, G., DeBorchgrave, C., Durieux, E., François, M., Lukesch, R., Saraceno, E., Soto, P., Thirion, S., Champetier, Y., Janot, J-L. 1997: Innovation and Rural Development.*The Observatory Dossiers,No.2, European Observatory Leader*, Brussels.

Huggins, R., Izushi, H. 2007: Competing for Knowledge: Creating, Connecting and Growing. London: Routledge

Jean, B., 2014: A new paradigm of rural innovation: learning from and with rural people and communities.*ERSA Conference*. St-Peterbourg, Russia.

Leeuwis, C., Ban, A. V. D.2004: Communication for rural innovation: rethinking agricultural extension. *Oxford Blackwell Science*.

Lorber, L., Žiberna, I. 2014: The Influence of the New Rural Development Paradigm on Changes in Land Use: The Case of Pomurje Region.*Podravina: časopis za multidisciplinarnaistraživanja*, Vol.13, No.26, p. 20-38,Samobor.
http://hrcak.srce.hr/index.php?show=clanak&id_clanak_jezik=194146

Lorber, L. 2005: Regional development problems of Podravje.*Podravina: časopis za multidisciplinarnaistraživanja,*Vol.4, No.8, p. 107-120. Samobor.http://hrcak.srce.hr/index.php?show=clanak&id_clanak_jezik=116624

Lorber, L. 2003: Prenos znanja in tehnologij kot spod bujevalec regionalnega razvoja = Transfer of know-how and technology as stimulator for regional development. *Podravina, časopis za multidisciplinarnaistraživanja,*Vol.2, No.3, p. 76-89, Samobor.

http://hrcak.srce.hr/index.php?show=clanak&id_clanak_jezik=117501.

Mahroum, S., Atterton, J., Ward, N., Williams, A. M., Naylor, R., Hindle, R., Rowe, F. 2007: Rural Innovation.*NESTA*, London. 77 p.

Naldi, L., Nilsson, P., Westlund, H., Wixe, S. 2015:What is smart rural development.*Journal of Rural Studies 40*. p.90-101, Elsevier.

Poole, N., Penrose Buckley, C. 2006: Innovation challenges, constraints and opportunities for the rural poor.

https://www.ifad.org/documents/10180/346d2bfa-8853-41d5-bcfd-03ff144effd9

Smits, R.E., Kuhlmann, S.,Shapira, P. 2010: The Theory and Practice of Innovation Policy – *An Inter-national Research Handbook*. Edgar Elgar.

Voutilainen, O., Wuori, O. 2012: Rural development within the Context of Agricultural and Socio-economic Trends – The case of Finland.*European Countryside*, No.4.

Sources

CAP after 2013: http://ec.europa.eu/agriculture/cap-post-2013/index_en.htm.

Europe 2020: http://ec.europa.eu/europe2020/index_en.htm.

EU Rural Review, 2009: Creativity and Innovation in EU Rural Development.European Commission.*The Magazine from the European Network for Rural Development.*

EU SCAR 2012: Agricultural knowledge and innovation systems in transition – a reflection paper. Brussels.

http://ec.europa.eu/research/agriculture/scar/pdf/akis-draft.pdf.

HORIZON 2020,

http://ec.europa.eu/research/horizon2020/index_en.cfm?pg=h2020.

Innovation Union2020,

http://ec.europa.eu/research/innovation-union/index_en.cfm.

OECD 2006: The New Rural Paradigm: Policies and Governance.*OECD Rural Policy*

Reviews, ISBN 92-64-02390-9.

OECD 2007: Innovative Rural Regions. The role of human capital and technology.Cáceres, Spain, 8p.

www.oecd.org/gov/regionaldevelopment/caceres.

OECD 2012: *Innovation and Modernising the Rural Economy*.8th Conference on Rural Development, Krasnoyarsk, Russia,
http://www.oecd.org/rural/krasnoyarsk/Innovation-Modernising-Rural-Economy.pdf.
SORS – Statistical Office of the Republic of the Slovenia, 2012:The 2010 Agricultural Census – Every Farm Counts. Ljubljana. http://www.stat.si/StatWeb/File/DocSysFile/1164
The World Bank 2012:Agricultural innovation systems: an investment sourcebook.Washington, 684 p.