Living labs in integrated agriculture and tourism activities: Driving innovations for sustainable rural development

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Abstract: Among the number of the approaches and types of proinnovation structures the living lab concept gathering momentum in last years is one of the most promising in the processes of developing goods and services full-filing consumer demands. The active involvement of end-users in research and innovation life-cycle is a prerequisite for raising competitiveness and improving business environment. It is a way of entrepreneurship encouragement and meeting challenges of assuring safety, quality and sustainability in all the spheres of economical life. The paper explores the living labs concept and makes SWOT analysis for the use of the living labs approach in developing sustainable agriculture and tourism sector in rural areas in Bulgaria. It scrutinizes the important questions of establishment and management of such structures. The study considers the use of the approach in a broader aspect through its role in driving innovations for sustainable rural development. The last one, as well as rural regions revival, has been intensively discussed in the examined country but the ways of achieving it are difficult to be found. Thus, the investigation concerns the opportunities for the use of the living labs approach and its feasibility in integrated agriculture and tourism activities.

Key words: living labs, sustainable rural development, innovations

1. Introduction

In modern time the shift from a product-based economy to a user-centred one brought to many challenges before companies concerning innovativeness and flexibility issues in market positioning. The importance of technological factors and users' feedback in innovation processes leads to the development of the living labs concept in recent years as open innovation intermediaries. The development of rural areas in Bulgaria is the key issue in many legislative and strategic documents and priorities are set to enhance attractiveness and strengthen development. The opportunities which are provided by agriculture, food industry and tourism make them the sectors with greatest significance in the processes of overcoming rural depopulation through sustainable economic and social development (goods and services according to end-us-

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ers demand in conditions of sustainable use of resources). In seeking ways of competitiveness raise and entrepreneurship encouragement the concept of living lab is explored making SWOT-analysis for the use of the living labs approach in developing sustainable agriculture and tourism sector in rural areas in Bulgaria. Then, establishment and management challenges are described through a model proposed for these structures.

2. Materials and methods

A short review of the living labs concept and SWOT-analysis for the use of the approach in developing sustainable agribusiness and tourism development in rural areas in Bulgaria were made. In the SWOT-analyses the assessments were made by the scale from 1 to 10 (1 the lowest, 10 the highest score) in a table. Then the results were summarized and put into a figure.

In addition, a round table discussion with experts in the field of agribusiness and tourism was organized who assessed 5 statements of the authors according to the scale from 1 to 5 (1 the lowest, 5 the highest score). Finally, a model was developed for setting up and functioning of such structures involving key actors in the implementation of activities.

3. The living labs concept

During the last years, the concept of living labs as environments of user driven and collaborative innovation has received much attention (Schaffers et al., 2012). The term 'living lab' (LL) was given at the first time in 2003 by William Mitchell from MIT, Media Lab and School of Architecture and City Planning. He defines this new concept as a research methodology for sensing, prototyping, validating and refining complex solutions in multiple and evolving real life contexts (Mabrouki et al., 2010). Now, there are many definitions in the literature united by the presumption that users of goods and services should participate at the very early stages of their development and drive and contribute to innovations rather than being just consumers and objects of innovations. Living labs have the endeavour to support actors such as SMEs by offering a neutral arena where stakeholders can meet and co-develop innovations in real-world contexts (Stahlbrost, 2012).

The risk of new product development investments is that they are wasted if users and customers do not accept their results. Living labs set out to involve users early on in the process to reduce this risk (Katzy et al., 2012). The resources that a living lab provides are: physical facilities for co-design, test-beds, collaboration tools supporting the interaction among the stakeholders of an innovation initiative, knowledge management platforms and human resources supporting the living lab services (García-Guzmán et al., 2013).

This new concept is also represented as innovation environments where stakeholders form a partnership of enterprises, users, public agencies and research organizations (Mabrouki et al., 2010). Living labs are open innovation infrastructures shared by several stakeholders (García-Guzmán et al., 2013). Particular roles for the groups of companies, research institutions and policy makers include: universities—initial research of the technical infrastructure/ implementation of the living lab, collaboration with government regarding funding, development of services/ products to be tested on the living lab; private sector—collaboration with government regarding funding of projects, commercialization of product/ service, collabo-

ration with universities and government regarding research required; public sector—initial funding to establish living lab infrastructure, on-going funding to stimulate innovation and testing on the living lab (Cosgrave et al., 2013).

Living labs provide a novel approach to foster innovative thinking within a user-centric environment (French et al., 2013). Typically living lab projects are led by local governments or private firms with the aim of driving innovation or new product development (Cosgrave et al., 2013). ICT could potentially enable information sharing and thus facilitate and improve a knowledge-based production (Wolfert et al., 2010). Usually living labs are heavily subsidized by government or international grants, and supported theoretically by academics and companies with specific interests (Cosgrave et al., 2013). Living labs promote an alternative innovation paradigm: the end-user's role shifts from research object to a pro-active position where user communities are co-creators of product and service innovations. It should be distinguished from other approaches such as test beds (laboratory environment) or field trials (Wolfert et al., 2010). Schuurman, De Moor, De Marez and Evens (2011) define living labs as a research approach where users are considered as co-partners in the process of innovation and where they can materialize their own needs, aspirations and wishes in their real-life context through their active involvement. This is sometimes referred to as the living lab-philosophy: to turn users from being traditionally considered as a problem into value creation (Schuurman et al., 2011).

As the living lab concept is strongly related to the user driven innovation principles, it is essential to address user involvement during the whole innovation lifecycle in the projects managed in a living lab (García-Guzmán et al., 2013). Five basic principles for conducting living lab operations are proposed—value, openness, realism, influence, and sustainability that can be used to assess the impact of living labs (Stahlbrost, 2012). In LL, innovation from start to finish is embedded in the real-life context of users and all organizations involved in a network are collaborating from the start of innovation (Wolfert et al., 2010). Living labs become an innovation area where users co-create with developers and researchers (Cosgrave et al., 2013). Living labs are complex innovation organizations, requiring not just physical facilities but also careful development of key relationships and networks (García-Guzmán et al., 2013). Open innovation is a vital element of the knowledge-based economy (Wolfert et al., 2010). The living lab-concept is closely linked to the notion of 'open innovation', the 'interactionist' stance regarding user research and concepts from the social shaping of technology such as 'social learning' and 'innofusion' (Schuurman et al., 2011).

Open innovation is in fact a collective term for several trends that have been recognized by researchers for quite some time. These trends include the role of lead users and the organization of R&D in network relationships (Wolfert et al., 2010). Levén and Holmström (2008) (cited by Schuurman et al., 2011) identified four factors that have facilitated the decline of the closed innovation model in favour of open innovation: 1) the existence of critical sources of knowledge outside the research laboratories of large companies; 2) knowledge flows between (competing) companies caused by changing job positions of employees which take their knowledge with them; 3) the increasing number of possibilities for developing ideas and technologies outside firms (e.g., through spin-offs); and 4) the increasingly important roles played by other actors in the value chain, such as customers and users, in contemporary in-

novation processes. Companies are demonstrating a greater openness to external knowledge and to new organization models and principles, with a view to accelerating innovation. Open innovation is often contrasted with a closed innovation model, based on the development of innovations within an R&D department (Wolfert et al., 2010). Living labs may be influenced by university research and government initiatives, and other foreign investment can also direct the types of experiments coordinated. Companies also have an interest although are often not equipped with the funds to support the project (Cosgrave et al., 2013).

Thus, living labs are infrastructures that turn ideas into innovations with high level of transfer into practice and usefulness. 'Living lab is a research methodology for innovation that challenges the whole research and innovation process in real-life conditions by human, social, cultural, organizational and institutional aspects, and has an impact on sustainable service, business and technology development' (Mabrouki et al., 2010). Evolving from observing the living patterns of users and having varying applications from home environment and industry orientation to education and training, now the living lab concept is more and more used in ICT sector and its integration to other branches of national economies. The current study pays special attention to the application of the concept in rural development through integrated agriculture and tourist activities for driving innovations for sustainable development. Agri-food enterprises operate in a complex and dynamic environment. To meet increasing demands of consumers, government and business partners, enterprises continuously have to work on innovations of products, processes and ways of cooperation in agri-food supply chain networks (AFSCN) (Wolfert et al., 2010). The sector of agriculture and food is focused on assuring food quality and safety. Rural development is marked by the goal of sustainability in the conditions of the new knowledge-based economy.

4. Results and discussion

SWOT-analysis for the use of the living labs approach in developing sustainable agriculture and tourism sector in rural areas in Bulgaria (Table 1) identifies strengths and weaknesses, opportunities and threats and makes assessments of the statements.

Table 1. SWOT-analyses

	STRENGTHS		WEAKNESSES	
INTERNAL	Driving innovations in agriculture and tourism	9	Money consuming	10
	Demand-driven development of agriculture and tourism	10	Time consuming	8
	Raising competitiveness of agriculture and tourism	8	Lack of experience in establishment and management	9
	Agriculture and food industry products positioning on inner markets	10	Lack of experience in intersectoral collaboration	8
	Encouraging entrepreneurship in rural areas	10	Low effectiveness of science-business relations	8

	OPPORTUNITIES		THREATS	
EXTERNAL	Funding by the EU programmes	9	Lack of start or on-going funding	10
	Achieving goals of sustainable development	10	Rural areas depopulation processes	10
	Economic growth and revival of rural areas	9	Structural failures	9
	Considering history, culture and traditions of regions	10	Failed projects	9
	Connection to ICT-innovations	10	Unwillingness/ distrust of some stakeholders to participate	9

S o u r c e: Authors' own elaboration.

The results from the summarized scores in the SWOT-analysis show that the opportunities are combined with a high potential of the system to use them but the threats could neutralize the strengths (Figure 1).

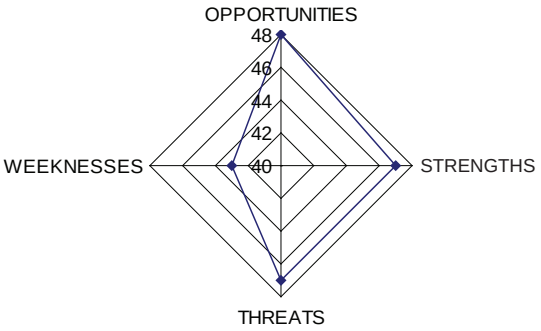

Figure 1. Summarized results of SWOT-analyses

S o u r c e: Authors' own elaboration.

A round-table discussion was organized with 6 experts who assessed the opportunities of application of the living labs concept in agribusiness and tourism sector in Bulgaria. The results (Figure 2) show that experts give high evaluations to the five chosen statements, although some doubts are connected to the opportunities for raising competitiveness and encouraging entrepreneurship in rural areas, assessment of the living labs as a concept for managing research and driving innovations, and opportunities for sustainable development of rural areas in Bulgaria. The main concerns during the discussion were that the economic development of the country and the insecurity in doing business and investments would impede those activities. Moreover, authors and experts stated that the state has no official policy or support for now and the concept is not known or popular among academics and publics. On the other hand, however, there is the fast development of tourism and agricultural sectors in the country which creates many opportunities for rural regions' revival. The application of the living labs concept in conditions of world open competition would give many competitive advantages.

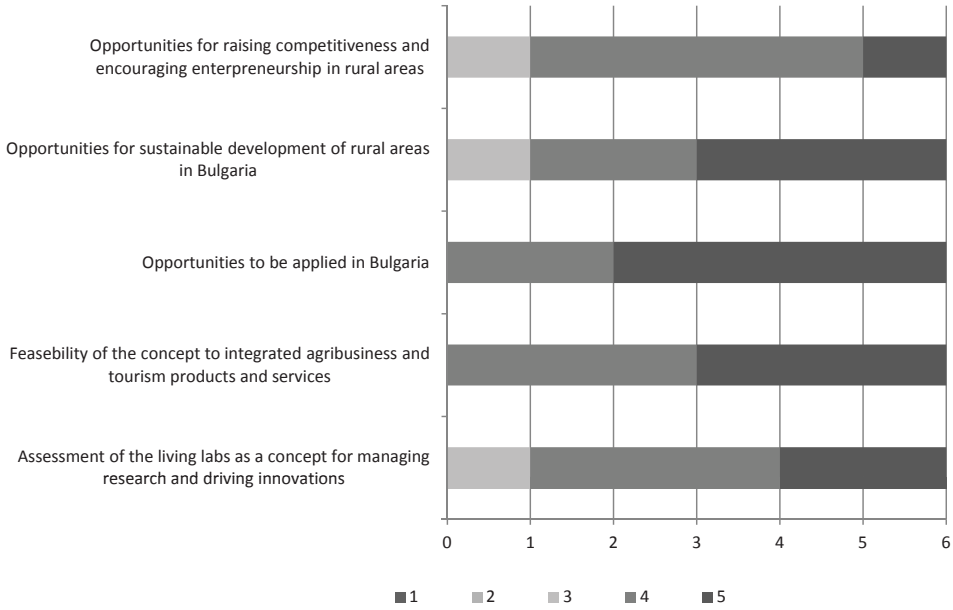

Figure 2. Results of the round table discussion assessing 5 statements by the scale from 1 to 5 (1 the lowest, 5 the highest score)

S o u r c e: Authors' own elaboration.

According to the proposed model (Figure 3), the creation of a living lab should be preceded by analyses involving all the actors and identifying key and practical problems. Then aims and strategies could be formulated containing general statements of solutions and rendering account to all the participants' motives and needs. In the establishment, functioning (innovation development processes) and management all the parties are involved according to their competences and opportunities. Government and its bodies, institutions or agencies, including local authorities, should arrange the right legislative framework and policies, as well as some financing. The main leadership and financing should be charged to business—agriculture, processing and food industry and tourism. Research and education institutions are the ones providing knowledge. Non-governmental organizations could provide necessary public awareness in the civil society and public relations. End-users should be motivated for active participation in the open innovation processes. They play a key role in the feedback system too. Keeping their motivation level is a main task in the functioning of the living lab.

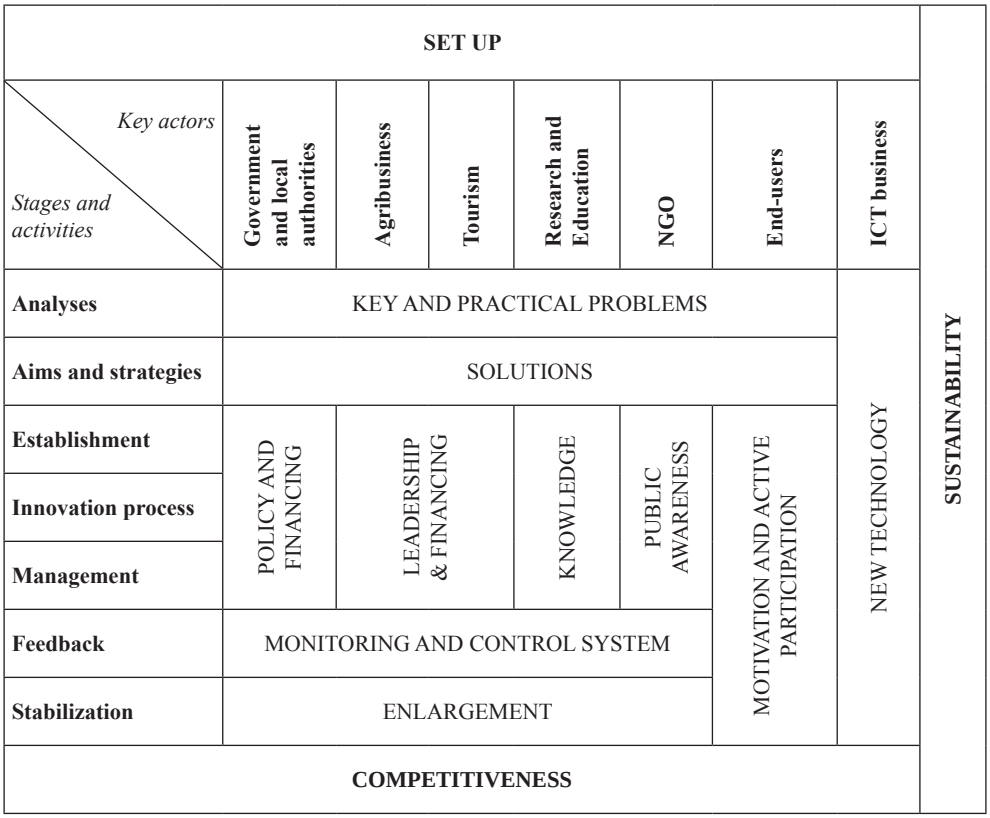

Figure 3. Model of set up and functioning of a living lab in integrated agriculture and tourist activities for sustainable rural development

S o u r c e: Authors' own elaboration.

Another relevant point is organization and management of a living lab and involvement of end-users in the innovation lifecycle—ideas, design, development and validation. The issues of project financing, market positioning and venturing are posed to developers (business) in connection to stabilization and sustainability of the living labs. Researchers manage research and user-driven innovation in connection to flexibility. That way living labs assure sustainability of innovations.

The study does not intend to go further on the principal and the concrete management structures and types of legal organizations of such living labs which are out of its scope. As a remark, the authors would like to add that bearing in mind the territorial size of the country and its geographical, economic and social characteristics, there could be just a few living labs in the considered sectors but having a broad spectrum of activities and scale of interference.

The involvement of the ICT business through new technology is of extreme importance in contemporary world. It is involved in all stages and activities.

The innovation lifecycle phases in a living lab should be properly identified and managed starting from the incubation of ideas and projects, through design of products and services, technical development, until validation of prototypes and technology transfer. From the organizational point of view a living lab besides the necessary infrastructure, financial and human resources, should be equipped with internal rules of management and functioning including monitoring procedures and active participation of end-users.

5. Conclusions

In contemporary globalizing world one of the most prominent and mutually connected goals governments and international institutions have, are those of sustainable development, knowledge-based economy and transfer of innovation. The connection science-business is a subject of many discussions and financing schemes in European and national programmes, and especially the building of innovation infrastructure. In all these processes the user-centred approach in innovation research is the leading one but the organization and implementation of activities is a tricky task.

Living labs are innovation structures uniting research organizations, business and end-users in design and development of new product and services. The concept could be successfully implemented in national documents for assuring sustainability of innovation in agribusiness and tourism. As open innovation intermediaries, living labs take into account technological factors, as well as cultural, historical and geographical characteristics of regions in multidisciplinary collaborative work. The user-driven innovation approach put some important challenges connected to organizational concerns and participants' feedback. Living labs could function as open platforms in close connection to ICT innovations providing flexibility and sustainability. Collective innovation development by researchers, developers and end-users considers new forms of managing research and innovation. The issues of setting targets and boundaries, financing and outcomes, involvement of key actors should be discussed in close connection to specific sectors, regions or countries.

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„Żywe laboratoria" w zintegrowanych działaniach agroturystycznych. Siła napędowa innowacji dla zrównoważonego rozwoju obszarów wiejskich

Abstrakt: Spośród wielu metod i typów struktur proinnowacyjnych koncepcja żywego laboratorium nabrała w ostatnich latach rozpędu i jest jedną z najbardziej obiecujących w procesie rozwoju produktów i usług spełniających wymagania konsumentów. Aktywne zaangażowanie użytkowników końcowych w badania cyklu życia jest istotnym warunkiem podniesienia konkurencyjności i poprawy otoczenia biznesowego. Jest to również promocja przedsiębiorczości i sposób na pokonywanie trudności w zakresie zapewnienia bezpieczeństwa, jakości i stabilności we wszystkich sferach życia ekonomicznego. Artykuł przedstawia koncepcję żywych laboratoriów oraz analizę SWOT użytkowego podejścia do koncepcji żywych laboratoriów i ich wkładu w rozwój zrównoważonego rolnictwa na obszarach wiejskich sektora turystycznego Bułgarii. Stawiane są kluczowe pytania w kwestii tworzenia i zarządzania takimi strukturami. W artykule rozważane jest stosowanie, w szerszym aspekcie, tej koncepcji poprzez jej rolę w pobudzaniu innowacyjności na rzecz zrównoważonego rozwoju obszarów wiejskich. Ożywienie rozwoju wspomnianych obszarów jest tematem wielu dyskusji w Bułgarii, trudno jednak znaleźć odpowiednio efektywne sposoby jego osiągnięcia. Dlatego też artykuł prezentuje możliwości dotyczące stosowania koncepcji żywych laboratoriów i jej wykonalności w zintegrowanych działaniach na rzecz rozwoju rolnictwa i turystyki.

Słowa kluczowe: żywe laboratoria, zrównoważony rozwój obszarów wiejskich, innowacje