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COOPERATION AS A SUSTAINABLE FACTOR INFLUENCING INNOVATION IN REGIONAL DEVELOPMENT: THE CASE OF THE BIOECONOMY IN LATVIA

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Abstract. The scientific literature points out that cooperation increases the capability of an enterprise to engage in innovative activities. Besides, due to a change in the concept of regional development, much greater focus in growth in territories is placed on human capital, and the essential role of education and knowledge in innovation is stressed as well. Sustainable innovation is not only an economic category, and it mainly involves a social process where cooperation plays a great role. The research aim of the paper is to assess cooperation as a factor influencing sustainable innovation in the regional aspect based on the case of the bioeconomy industry in Latvia. The development of the bioeconomy represents transition from fossil to renewable sources, and it encompasses important industries of the economies of the regions of Latvia: forestry and agriculture. In Latvia, bioeconomy industry enterprises were quite cautious in their innovative activity and mainly focused on existing innovations that they adapted to their needs, and their innovative activity was observed only within their region. A positive fact is that most of the enterprises highly rated their cooperation with scientific and research institutions in developing innovations. The promotion of cooperation is one of the objectives that specialists of the Entrepreneurship Centres of the planning regions of Latvia have to deal with, yet their capacity is not sufficient for the promotion of cooperation among innovative enterprises in the region in the context of sustainability.

Keywords: cooperation, innovation, regional development, bioeconomy, sustainability.

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1. Introduction

The goal of any national and regional policy is to achieve steady and balanced economic development. For several decades, the promotion of innovation has been considered to be an important instrument in achieving such a goal. However, it has been frequently admitted that innovation is a complicated and multifaceted process that is unimaginable without cooperation among various organisations and institutions. For this reason, innovation in the context of sustainability is perceived not only as an economic category but also as a wellbeing and environmental category. In making innovation policies at the European Union level, the central role is played particularly by education and research institutions as a source of knowledge, although the entrepreneurship sector is the one that completes this process by commercialising the knowledge. Since the beginning of the 21st century, an essential role in national innovation policies has been played by national innovation system

concepts. However, it has to be noted that innovation system components: enterprises, education and research development, the national institutional framework or the legal framework and finances are mainly analysed within the system, while placing less focus on interaction and cooperation.

As regards the performance of the innovation system of Latvia, according to reports by the Innovation Union, a small number of innovative enterprises in the country and a lack of cooperation have been the key weaknesses over several years. According to a report by the Central Statistical Bureau of Latvia, only a fourth of innovative enterprises had cooperated with other enterprises, institutions or other partners. Besides, the share of investment in research and development (CSB) by the entrepreneurship sector was low (27.6%), which was two times lower than the average in the EU Member States (55%) in 2014. This indicates that previous activities in Latvia did not promote the engagement of enterprises in the innovation process and the existing conditions did not contribute to the expansion of cooperation and system sustainability.

The research object of the paper is cooperation as an element of introduction of sustainable innovation. The research aim of the paper is to assess cooperation as a factor influencing sustainable innovation in the regional aspect based on the case of the bioeconomy industry in Latvia. The specific research tasks are as follows: 1) to review the scientific literature on the role of cooperation in sustainable innovation in regional context; 2) to assess cooperation among enterprises of the bioeconomy industry in Latvia in relation to innovation; 3) to assess the role of entrepreneurship centres in the promotion of cooperation in the regions of Latvia.

2. Theoretical discussion

The scientific literature focuses on innovation from the perspectives of various science branches – economics, sociology, technology management, marketing and psychology – and each science branch examines the innovation differently; therefore, research studies lack the context of sustainability. Economic research studies view innovation as a factor contributing to productivity and economic growth, and enterprises are seen as economic actors, focusing on the entrepreneurship environment fostering innovation (Oganisjana et al. 2017; Akhter 2017; Čirjevskis, A. 2017). Research studies employ investment in research and development (R&D) as well as the number of submitted patents as indicators, yet the indicators are not directly associated with the key phase of the innovation process – the introduction of an innovation (Gopalakrishnan, Damanpour, 1997).

The Organisation for Economic Cooperation and Development has developed guidelines for an international methodology for the collection and processing of data on innovation. The Organisation defines innovation as the implementation of a new or significantly improved product (good or service) or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations. This definition is referred to in policy documents of various levels (OECD, 2005). However, the World Bank stresses that “innovation and research are individual processes, and not always an innovation emerges in the research process. Any innovation emerges in the entrepreneurship sector that brings it into the society, and the success of it depends on the responsiveness of the society; for this reason, innovation is mainly a social process” (World Bank, 2010). In Latvia, innovation is often defined as a process in which new scientific, technical, social, cultural or other ideas are embodied in a good or service that is demanded and competitive in the market (National Innovation Programme 2003-2006, Law on Scientific Activity). If compared with the above-mentioned definitions, the definition widely used in Latvia is narrower and mainly focuses on product innovation, not stressing the role of the social process. Compared with the mentioned alternatives, as noted by Latvian scientists, innovation or the innovation introduction process has to be more effective. It has to encompass organisational and environmental sustainability elements (Dobele L., Grīnberga-Zālīte G., Kelle L., 2015).

Social focuses have changed not only in relation to economic growth in the country as a whole but also in individual territories of the country. It was explicitly obvious in regional policies in the last three decades when regional development paradigms changed. In the past, the central focus in regional development theories was the location of a region and available resources, whereas nowadays an increasing role is played by human capital. A number of authors (Florida, 2003; Sleuwaegen, 2014; Karlsson, Johansson, 2008) have researched the creative

activity of individuals as a cornerstone of regional growth. The influence of the creative human class on innovation has been also proved by other authors (Batabyal, Beladi, 2016; Sleuwaegen, 2014) who stated that there was a causal relationship between the activities of the creative human class and innovation results. This means that two sustainable development dimensions are stressed in innovation development: economic and social.

Richard Florida, a researcher of social and economic theories, emphasises that in regional development context, the key pillar is “3Ts” – technology, talent (individuals with higher education and the creative class) and tolerance to diversity. To foster economic growth and innovation, according to him, all the mentioned aspects have to be developed in a region (Florida, 2003). There are some authors who criticise this creativity-based concept for development, pointing out that the integration of this approach in policy-making contributes only to the well-educated and wealthiest part of society, thereby increasing inequality (Bontje, Mustard, 2009), as well as it is stressed that efforts in commercialising creativity in less developed regions could lead to some kind of degradation of cultural values (Eversole, 2005). Nevertheless, the authors of the paper believe that this criticism is based on cases where the “3T” approach is misunderstood and used inappropriately, emphasising only part of this concept. Furthermore, an important factor for the promotion of innovation in a region is tolerance or openness to new ideas, diversity and ability to cooperate. In regions where the innovation level is low, it is important to establish a system that contributes to both social and innovation-related factors, thereby forming a sustainable innovation system in which both available economic resources and the society of the region (the community of residents and their ability to cooperate) play an equal role.

In establishing national- or regional-level innovation systems, the Triple Helix concept is often taken into account, which focuses on synergies among three pillars: research, entrepreneurship and public administration (Herliana S., 2015). This concept highlights the important role of education and research institutions in innovation, as the institutions contribute to knowledge that is the basis for innovative development. The Triple Helix theory supports the establishment of new institutions from the existing structures of the education system, industry and the government to create, spread and apply knowledge in order to contribute to cooperation. Both in the context of regional development and in entrepreneurship, cooperation among various institutions becomes increasingly popular. Part of academic research focusing on innovation considers the link between cooperation and innovation. The role of cooperation in innovation has been extensively researched already since the early 2000s. Tether (Tether, 2002) stresses that cooperation in the innovation process means the engagement of all stakeholders in joint activity, and ordinary contract work, which does not involve the active participation of the partners, is not considered to be cooperation.

Already at the beginning of the 21st century, Becker and Jürgen (Becker, Dietz, 2004), who researched the manufacturing sector of Germany, discovered that cooperation with other enterprises and organisations increases the opportunity to commercialise new products and the number of cooperation partners makes a positive effect on the development of new products by an enterprise. Recent research studies too in European countries refer to the positive effects of cooperation on innovation results – the launch of new products on the market and the submission of patents (Antolin-Lopez et al., 2015) –, and enterprises that cooperate with their customers and academic institutions and are cluster members have greater opportunities to introduce radical innovations (Zastempowski, Przybylska, 2016). In high-technology industries, cooperation and involvement in scientific research activity positively affect all kinds of innovation (Simonen, McCann, 2008).

What actually is understood by the term cooperation? The term cooperation used in Latvian is defined as joint activity and mutual assistance aimed at achieving common goals. However, in English there are two terms: cooperation and collaboration, which have slightly different meanings. According to group teaching theory, the term cooperation refers to knowledge exchange among team members, while the term collaboration relates to strong ties and high trust (Nissen, H. et al., 2014). The meaning of the term used in Latvian is closer to that of the English term cooperation.

Academic research studies admit that cooperation increases the capability of enterprises to engage in innovation activities because through cooperation the enterprises get access to resources that supplement their internal resources; besides, it also allows reducing costs and risks (Noseleit, Faria, 2013; Tether, 2002). In their research

studies on motivation to begin cooperation and the choice of partners for creating innovations, a number of authors (Miotti, Sachwald, 2003; Cespedes-Lorente, et al., 2015) focus on the concept of entrepreneurship resources and add the aspect of enterprise strategic goals to the concept. For example, if the goal of an enterprise is to reduce its costs and risks by using economies of scale, it is going to choose to attract similar resources; however, if its goal is technological change management, the enterprise will attract the lacked resources that supplement its resources (Noseleit, Faria, 2013). Market-oriented enterprises often enhance their products through cooperation with their customers, suppliers, consultants and other producers, while entrepreneurship-oriented enterprises create both product enhancements and radical innovations, choosing higher education and specialised public institutions as cooperation partners (Cespedes-Lorente, et al., 2015). It is also pointed out that although there are a lot of advantages for cooperation, not always cooperation projects are successful (Antolin-Lopez R. et al., 2015). A failure, of course, can serve as a hindering factor for the wish of other enterprises and organisations to engage in cooperation projects. Cooperation is often preferred by large enterprises (Gallego et al., 2013, Tether, 2002), enterprises from high technology industries or fast-growing industries (Miotti, Sachwald, 2003) and enterprises focusing on higher-level innovations (Tether, 2002). This means that cooperation is important in the capability of any particular enterprise to introduce innovations; it is an additional resource assisting the enterprise to reduce its costs, thus contributing to its development potential.

The innovation capacity of enterprises is important not only at the level of individual enterprises but also at regional level, forming a regional innovation system. In Norway (Dahl, Rodriguez-Pose, 2015), disparities across regions were discovered when researching cooperation ties geographically – at regional, national and international levels. Regional cooperation was effective in the regions where research and development intensity was higher, while international cooperation was significant in the regions with a higher proportion of well-educated labour. The case of Norway shows that cooperation within one region not always yields expected results if the region lacks a sufficiently high level of research and experience. This means that a new knowledge is not spread among organisations, which would assist them to create new innovations. However, if the region has a well-educated labour force, the knowledge could be acquired if cooperating at national and international levels. International cooperation partners provide access to knowledge that is specific to and typical of the nation about technological matters, sales market specifics and other issues. However, the case of the USA stresses the role of a region particularly in the field of finances. Totally, the USA accounted for a third of global investment in R&D (research and development). In 2006, it reached 2.6% of the GDP of the USA and amounted to USD 340 billion, and most of the investment was made by entrepreneurs, yet the share of the investment by the government was also high – 35% –, and most of the public funding came from federal budgets (Рыхтик, 2011). Regions could co-fund sustainable innovations through supporting research and development projects implemented by enterprises of the regions (Grinevica et al., 2016). The role of innovation is multifaceted in the context of regional development, and every territory may choose the most appropriate kind of support regarding how to promote cooperation, particularly among business, research and public administration.

3. Research design

The authors conducted a study at the end of 2016 and the beginning of 2017 to assess cooperation as a factor important for sustainable innovative development. The authors chose the enterprises from the bioeconomy industry, as their economic activity covered the entire territory of the country and such enterprises were sufficiently represented in all five planning regions of Latvia: Kurzeme, Zemgale, Latgale, Vidzeme and Riga. The study involved also specialists from entrepreneurship centres of the planning regions who were in charge of entrepreneurship promotion measures in the regions. Furthermore, in the context of the circular economy, it is of great importance for enterprises from the bioeconomy industry to cooperate and employ a new knowledge in the creation and introduction of sustainable innovations. The bioeconomy is based on three key principles of sustainable development: nature, the economy and society and represents transition from fossil to renewable sources. It involves a closed cycle for product circulation, in which the waste from one process is an input for another process. Growth in the bioeconomy provides opportunities for growth in the national economy of Latvia based on its strongest key industries: forestry and agriculture. The bioeconomy sector, on the one hand, is very comprehensible and simple, as it consumes inputs coming from nature and the environment, while on the other hand, if compared with other industries, it requires specific knowledge and skills to achieve growth in the sector by means of innovations and ensure sustainable use of natural resources.

The interview method was employed to identify expert opinions and attitudes through phone and Skype interviews as well as direct structured interviews, and the data were entered into a single database. An interview questionnaire meeting quality standards was developed for data processing and summarisation. In total, there were interviewed: 1) 45 entrepreneurs from the bioeconomy industry from various regions of Latvia; 2) heads (specialists) of the Entrepreneurship Centres of the five planning regions. The economic activity fields of the interviewed entrepreneurs were as follows: production and processing of primary products of crop and livestock origin; production of wood and wooden products; forestry and logging; fishing and the production of aquaculture products; energy production from biomass of agricultural and/or forestry origin; rural tourism; production of fertilisers and plant protection products.

The entrepreneur interviews were conducted in the period from 1 December 2016 to 15 April 2017. In view of the fact that the creation and introduction of an innovation requires comprehensive and broad competences, the entrepreneurs were asked questions about gaining experience and cooperation with scientific and research institutions. The interviews of the Entrepreneurship Centre heads were carried out in March-April 2017. The interview questions related to activities performed by the Entrepreneurship Centres, market demand, industries etc. The interviews involved the entrepreneurship specialists from: LUC (Latgale Entrepreneurship Centre), ZUC (Zemgale Entrepreneurship Centre), VUC (Vidzeme Entrepreneurship Centre), KUC (Kurzeme Entrepreneurship Centre) and RUC (Riga Entrepreneurship Centre).

4. Research results

An analysis of the locations of scientific and research institutions shows that universities providing studies in bioeconomic specialities are located in Zemgale region (the central university is Latvia University of Agriculture) and the regions of Riga and Latgale where a number of research institutes operate within the universities. A few research institutes specialised in bioeconomics are present in the regions of Vidzeme and Kurzeme where the institutes are available in a smaller number than in the other regions.

An analysis of the intensity of cooperation with the scientific research sector and universities showed that 42% of the entrepreneurs lacked sufficient information, 40% pointed out that they had sufficient information about opportunities for cooperation with researchers, while it was difficult for 18% to answer, as they were not interested in such cooperation opportunities.

More than half of the interviewed entrepreneurs had cooperated with the scientific research sector, while 44% never cooperated with universities and the scientific research sector. Those entrepreneurs who had some cooperation, obtained information about such opportunities from university teaching personnel during their studies, in conferences and seminars, from university trainees, their children studying at universities, on the Internet, from producer associations, from competitors when seeking similar cooperation examples as well as from cooperation partners.

Of the entrepreneurs, six used scientist assistance to develop a new product or enhance existing ones, nine were involved in EU co-funded research projects, while seven were consulted by scientists on how to enhance their economic processes. One entrepreneur pointed out that his cooperation with researchers failed because they were not sufficiently interested in the problem to be tackled; another entrepreneur revealed that his cooperation was unsuccessful because there was no good information exchange during their work. The entrepreneurs pointed out that the reason of unsuccessful cooperation was the lack of time for the parties involved as well as the fact that scientists wished results but did not want to make practical efforts.

In total, 62% of the interviewed entrepreneurs pointed out that they would cooperate with scientists and researchers with pleasure, while 38% were not interested in such a kind of cooperation. Those entrepreneurs who would cooperate with scientists and researchers in future preferred using several kinds of cooperation, which are presented in Figure 1.

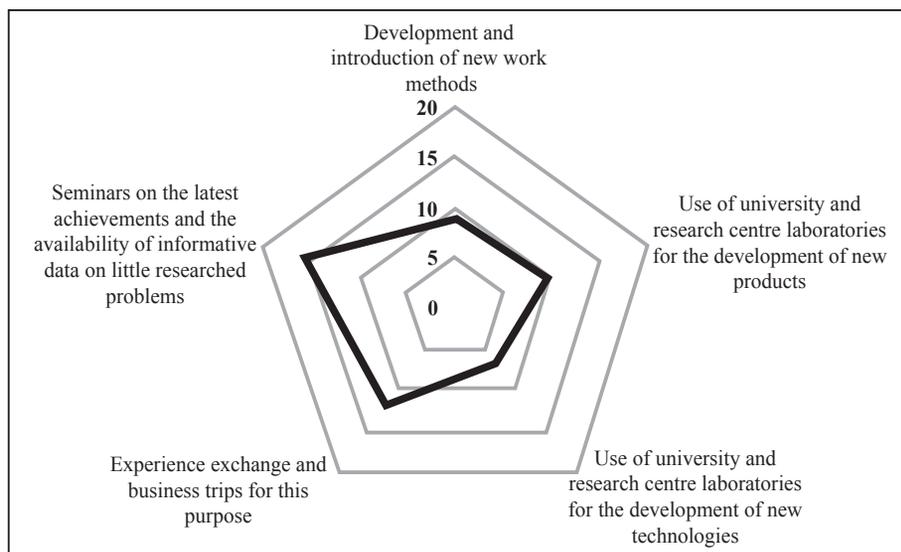


Fig. 1. Preferred kinds of cooperation with the scientific research sector for bioeconomy industry enterprises in Latvia

Source: authors' construction based on the interviews of bioeconomy industry entrepreneurs conducted in 2016/2017

The majority of the entrepreneurs preferred attending seminars on the latest achievements in science and using an opportunity for experience exchange activities; the next most popular entrepreneur wish was the use of university and research centre laboratories for the development of new products. Besides, the entrepreneurs wished to use an opportunity to test new technologies at the university and research centre laboratories. A small portion of the bioeconomy sector entrepreneurs pointed out that cooperation could take the form of exchange of opinions about product quality as well as marketing activities and further development.

When questioned about whether new goods or services were planned to be introduced in a medium-term (1-3 years), 60% of the entrepreneurs answered affirmatively, while 40% had not envisaged it in their current business plans. Those who pointed out that they planned to introduce new goods and services mentioned the lack of time as the most essential barrier to why they had not done it until then because the development, testing and launch of a new product on the market took a long time, followed by the lack of funds, the unavailability of labour, the lack of an economic feasibility study and the lack of competence to introduce innovations. In fact, a great deal of the problems could be solved if using cooperation partners. The entrepreneurs justified their reluctance to change and/or broaden their field of economic activity in the nearest future by their current narrow specialisations, the insufficiency of resources (particularly the utilised agricultural area), the need to stabilise their current production and marketing positions; besides, the entrepreneurs were reluctant to change anything or had an opinion that changes created additional disorder. As regards their current cooperation partners, the entrepreneurs from the bioeconomy industry appreciated the most cooperation with their friends and acquaintances, as well as input suppliers and service providers. In their opinion, cooperation with universities and research institutions was less important, and the majority of the entrepreneurs did not use cooperation opportunities at all or did it less than once a year. Information exchange with local governments and financial institutions was also practised relatively rarely, and in most cases it was done semi-annually when there was a need for services provided by the mentioned institutions.

Expressing their opinions about their enterprise development opportunities in their regions, in Latvia and at cross-border level, the entrepreneurs rated the opportunities as rather good; besides, they were more optimistic about expanding their businesses locally in their regions than nationally or internationally.

In the regions of Latvia, individual institutions were established within the administrations of the planning regions of Latvia – Entrepreneurship Centres –, the key objective of which was to promote entrepreneurship in the regions and become intermediaries between entrepreneurs and other institutions, thereby contributing to cooperation as well. For this reason, specialists from the regions were interviewed within the present research.

Answering a question about the role of Entrepreneurship Centre heads (specialists) in contributing to the development of innovative enterprises in the regions, the specialists unanimously pointed out that consultants could potentially play an essential role as intermediaries among innovation stakeholders, i.e. as cooperation partners. The head of LUC stressed that a consultant who understands the needs of a particular entrepreneur and actively participates in informing the entrepreneur about opportunities meeting his/her needs often provides a serious stimulus for the development of the particular enterprise. However, the head of VUC pointed out that VUC-implemented projects, which sought best practices to be implemented in Latvia, played a greater role in the development of innovative enterprises. The key activity areas of the Entrepreneurship Centres, which are aimed at developing innovative enterprises, are presented in Figure 2.

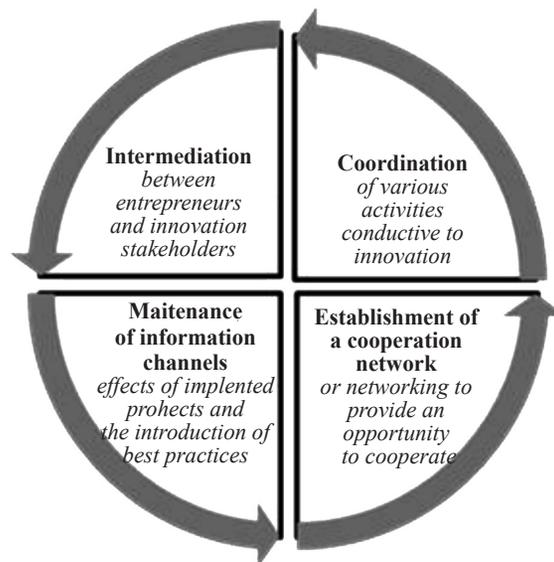


Fig. 2. Activity areas of the Entrepreneurship Centres aimed at developing innovative enterprises in the planning regions of Latvia

Source: authors' construction based on the interviews of Entrepreneurship Centre heads (specialists) conducted in 2017

An analysis of the factors hindering or constraining the expansion of entrepreneurship and particularly the establishment of sustainable innovative enterprises in a region allows concluding that the reasons are diverse. The RUC specialist pointed out that the cooperation infrastructure was poor, as there were several organisations that implemented individual activities or a set of activities, yet they lacked a strategic cooperation framework and the coordination of the activities. The KUC head noted that the key problem or barrier regarding the expansion of entrepreneurship was the lack of individuals in the region and the fact that as many national institutions as possible have to be moved outside Riga region. The VUC head informed that there was a lack of support instruments that have to be developed based on the needs and obvious advantages of the regions. More decentralisation methods should be employed in developing territorial development strategies and support instruments for entrepreneurship. At the same time, there was a lack of small-scale financial instruments with 100% support intensity, as such instruments could considerably affect the commercialisation of innovations and the transfer of technologies between research institutions and businesses. The ZUC head pointed out that many local authorities still lacked purposeful long-term plans that could contribute to the sustainable innovative development of the environment for entrepreneurship as well as the proportion of youth engaged in entrepreneurship was low, which could be due to quite negative information about the environment for entrepreneurship in Latvia.

The Entrepreneurship Centres did not focus on certain industries to be especially developed, as entrepreneurship plays an essential role in any area or industry in the regions. Consultations provided by LUC were given mostly to enterprises related to such industries as wood processing, metalworking, textile and food production. Besides, a great deal of the enterprises belonged to the bioeconomy sector. However, at KUC, enterprises of no dominant industry were consulted; the industries were diverse – beginning with worm production through to charging stations for electric automobiles worth millions. Interested individuals representing home production and tourism and a few ones engaged in wood processing visited VUC and ZUC for advice. Stable cooperation with new social and crea-

tive industry entrepreneurs was established at RUC – the Entrepreneurship Centre located in the capital city. The most popular entrepreneurship areas served by the Entrepreneurship Centres are presented in Figure 3.

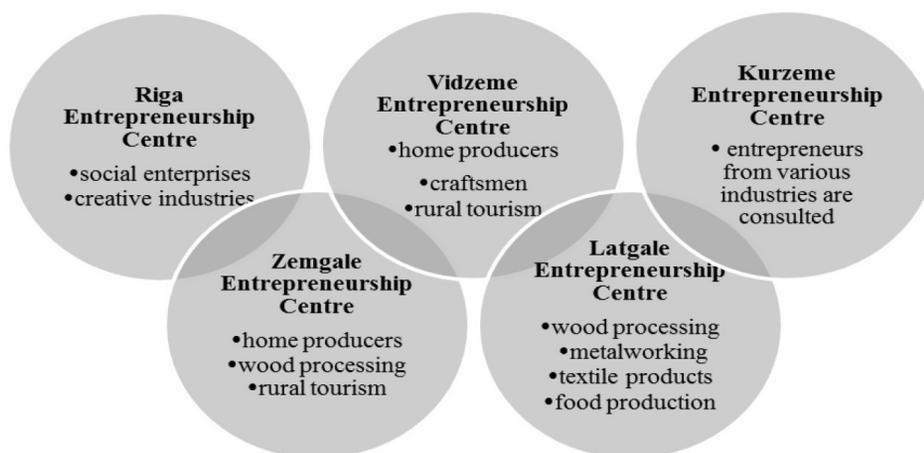


Fig. 3. Most popular entrepreneurship areas served by the Entrepreneurship Centres in the planning regions of Latvia

Source: authors' construction based on the interviews of Entrepreneurship Centre heads (specialists)

When questioned about whether the specialists of the Entrepreneurship Centres cooperated with scientific and research institutions, the answers were that in general no cooperation existed. For example, RUC cooperated with scientific and research institutions within a cross-border project of the European Union. Even though this cooperation was not stable and systematic, it could be one of the most important responsibility areas for the specialists of the Entrepreneurship Centres in future. LUC cooperated with Daugavpils University and Rezekne Academy of Technologies within some activities, and its cooperation was in the field of employee training. KUC pointed out that scientific and research institutions wished funding for their cooperation, as services provided by their research institutes were costly. VUC cooperated with scientific and research institutions within the high-quality food cluster. ZUC used opportunities for cooperation with Latvia University of Agriculture, while asserting that the situation was as follows: the scientists were not able to meet the demand of society for their services.

Conclusions

Scientific discussions on the role of cooperation in innovative development point out that it is important not only to assess economic gains but also to stress the role of the social process in which cooperation is one of the forms of it. It is of great importance in the context of regional development because of the change in regional policies, as there is transition from the priority role of resources (raw materials) to the potential of society (human capital), thereby highlighting the sustainable development context in innovation.

In Latvia, bioeconomy sector enterprises consider the role of cooperation with scientific and research institutions in innovative development to be important, and a great deal of them had cooperated at least once and planned to do it in future; the obstacles to it were their narrow specialisations and limited financial resources, as well as the reluctance of the entrepreneurs themselves to change anything in their economic activity. The cautiousness of the entrepreneurs was also indicated by the fact that they associated their chances to expand their businesses with only their regions and did not see opportunities for their businesses in the other regions of Latvia or even abroad. This consideration could be viewed as important for the local region, but in a long-term it does not contribute to value added in that territory.

The cooperation of the entrepreneurs with scientific and research institutions, which was coordinated by the Entrepreneurship Centre specialists in the planning regions of Latvia, was fragmented. There was a lack of a strategic cooperation framework and coordination; at the same time, it has to be noted that the government's policy was weak, which resulted in a misbalance of geographical distribution of the population between the

capital city's region and the other regions of Latvia. This problem creates a threat of human capital outflow from the other territories of Latvia, thereby reducing the potential of sustainable innovative development in the regions of Latvia, which cooperation opportunities depend on.

In relation to the research problem, the following problems have to be tackled now in Latvia: first, the distribution of regional functions has to be changed, granting much greater powers to the regions, including the use of financial resources for the attraction of residents and the development of sustainable innovative processes; second, bioeconomy sector entrepreneurs have to be motivated to engage in innovative development, not only implementing imitation innovations but also radical ones, which are impossible without cooperation with the scientific research sector.

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