STOWARZYSZENIE EKONOMISTÓW ROLNICTWA I AGROBIZNESU
Roczniki Naukowe • tom XIV • zeszyt 6

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THE CONCEPT OF SMART SPECIALISATION IN THE DEVELOPMENT OF AGRIBUSINESS SECTOR ON THE EXAMPLE OF CLUSTER OF INNOVATIONS IN AGRIBUSINESS IN MAZOVIA PROVINCE

KONCEPCJA INTELIGENTNEJ SPECJALIZACJI W ROZWOJU SEKTORA AGROBIZNESU NA PRZYKŁADZIE KLASTRA INNOWACJI W AGROBIZNESIE W WOJEWÓDZTWIE MAZOWIECKIM

Key words: smart specialisation, clusters, innovation, agribusiness sector
Słowa kluczowe: inteligentna specjalizacja, klastry, innowacje, sektor agrobiznesu

Abstract. The paper presents the analysis of the pre-requisites, conditions and assumptions of the concept of smart specialization as both economic concept of knowledge based growth and real policy tool for the EU regions to the year 2020. It also makes a diagnose of Mazovia province with regard to smart specialization capacities and attempts to find out if the Cluster of Innovations in Agribusiness created for development of Mazovia's agribuisness sector based of innovations answers to the challenges of smart-specialization.

Introduction

The importance of research and development (R&D) is significantly growing in reaching the competitive advantages for countries, regions as well as for companies. It is argued that R&D throught innovation diffusion has become already a global game. In depth studies [Thursby, Thursby 2006; Globalization of Science... 2011, How Regions... 2009a, Science, Technology... 2011a, Regions and Innovation... 2011b] show that European companies are increasingly looking outside Europe for their R&D, and overseas companies are less and less inclined to base their R&D in Europe. Additionally there was an increase in US R&D investment in countries like China and India, at Europe's expense. Decisions about where to base research capacities are primarily made according to the availability of new ideas and technologies, highly skilled increasingly flexible and mobile, where they move is far from random. So called star scientists will move to where they can work with other star scientists, or with high-tech firms. Corporate R&D will gravitate to strong universities. Innovation service providers will appear close to large R&D companies. This process in recognized and named as an agglomeration, and it gives rise to benefits for those participants that are in a position to profit from the pool of knowledgeable human resources, ideas, services, and infrastructures that accumulates in the particular region. This in turn acts as a powerful force in attracting new R&D capacities from foreign countries.

Therefore, it was understood that if Europe is to be still a serious competitor in the global game of R&D location, policies need to be accordingly adapted. Forey and van Ark [2007] distinguished two main areas in which Europe is hampered in its efforts to attract international R&D. Firstly, the fragmentation along national lines is a brake on the process of creating world-class centres of excellence. It has prevented a more natural development, through agglomeration, of centres of excellence. If allowed to flow freely across national barriers, the best resources in a particular field would find each other and create a centre of gravity. Secondly, there is a tendency across countries and regions in Europe to look to emulate what successful regions or countries do, instead of trying to find an original area for expertise.

With this respect it needs to be emphasized that in the European Union (EU) most countries can be considered "small", a model involving national development of scientific expertise across the same sort of areas is likely to be inefficient. Equally, the wide-spread use of local tax credits and other subsidies aimed at promoting the formation of R&D-intensive clusters are likely to hinder the agglomeration process. This means that the EU is not reaping the economic benefits of these agglomerations. What was identified as needed instead are mechanisms for finding original and new areas of expertise. There

are benefits to be gained for the whole of Europe in moving towards an R&D system based on greater European-wide specialisation [Forey 2006].

The process is not just in a theoretical or academic discussions. Its formation is taking place on all levels of policy decision making: European, county as well as regional and it results will become effective once new financial perspective for the years 2014-2020 will be implemented. Since the adoption of the Lisbon Strategy, transition towards a knowledge economy has become a pivotal policy area for the EU. The member countries of the European Research Area (ERA) and the EU Commission have put innovation at the top of the policy agenda. The Lisbon Strategy includes the ambitious 3% target for national R&D intensity and national government have turned this into their own national goals. Governments have begun new initiatives and new policies to increase spending on R&D by both public and private sector. Supporting R&D and, thus, invention and innovation is just a first step. To achieve additional employment and income growth, R&D must be transformed into new products, processes and technologies which are adopted by firms, households and governments.

Materials and methods

The main objective of the paper is twofold. First it is aimed to analyze the pre-requisites, conditions and assumptions of the concept of smart specialization as both economic concept of growth and real policy tool for the EU. Additionally the objective was to make a diagnose of Mazovia province with regard to smart specialization capacities and find out if the Cluster of Innovations in Agribusiness created for development of Mazovia's agribuisness sector based of innovations answers to the challenges of smart-specialization. The main research tool were literature review and comparative analysis.

R&D specialization in competitive growth of regions

Analyzing the concept of knowledge based economies and their competitive growth Soszyńska [2012] pointed out that economies based on knowledge are developed in the countries or regions where significant investments for productive capital, infrastructure and R&D were issued. Moreover the more country or region is open to both create and absorb new technological knowledge the higher its economic growth. But the farer is the country or region from world's technological frontier the rate of growth using knowledge and innovation (if sufficient conditions will be met) is higher.

The literature emphasized also that the rate of growth of a country is determined by its initial level of development, the creation of new knowledge within the country and the absorption and exploitation of knowledge independently of where it is created. While knowledge creation shifts a notional technological frontier outward knowledge absorption moves the firm closer to the frontier. Particularly knowledge spillovers have been identified as important drivers for development in endogenous growth models [Veugelers, Mrak 2009].

With this regard many of the endogenous growth models suggest that countries develop along their own growth path. Through the presence of increasing returns, most often included in the model by broadening capital to including knowledge or human capital, it is possible to offset the tendency toward convergence. Increasing returns or externalities generate perpetual growth by keeping the marginal productivity of the accumulated factors from going to zero. The endogenous growth literature identifies commercially oriented innovation efforts as a major engine of technological progress and productivity growth [Worldbank 2010].

As indicated by McCann and Ortega-Argiles [2011] the particularly differences in the development model is seen when analysing the productivity gap between the US and Europe. The literature review done by the authors attempts to identify the key factors which underpin the productivity gap, and part of the explanation appears to be related to transatlantic differences in labour market performance including differences the quality of human capital, the rigidity of the European labour markets, differences in the adoption of new managerial practices and organizational investments or differences in the availability of venture capital. They identify that the US economy is slightly smaller than the EU economy, but US firms and labour markets enjoy greater scale advantages due to much higher levels of internal market integration. The EU Single Market was created precisely to foster such advantages, and while there has been much progress for example in goods markets, energy markets, transportation markets and some financial markets, in many service industries in particular the EU markets are still highly fragmented.

As a response to this issue the European Research Area (ERA) was established as a mechanism for engendering EU-wide integration and scale advantages in activities generating and disseminating knowledge. The policy aimed at promoting European R&D and EU-wide knowledge spillovers via the development of knowledge-intensive agglomerations and cross-border network systems of researchers,

universities, entrepreneurs and innovators. As such the ERA was aimed both at promoting knowledge-integration integration and also maximizing dissemination in many of the very sectors which currently lack EU-wide integration.

The concept of Smart Specialisation

With the upcoming programming period 2014-2020, the European Commission is designing new mechanisms for a more effective allocation of Structural Funds among European regions. In particular, the allocation of Innovation Related Structural Fund Resources, which in the past was connected to the development of a Regional Innovation Strategy, could be subject to compulsory delivery by the regions of Smart Specialization Strategies. Smart Specialization Strategy (S3) is a new concept developed by the DG Regio, based on the DG Research & Innovation work, aimed at identifying regional economic niches, being them a recognized excellence in comparison to other regions, within a specific territory (national or European). Smart Specialization Strategies could therefore facilitate the channelling of EU Innovation Structural Funds towards key regional innovation assets, where existing, therefore maximizing their impact on regional competitiveness. Smart specialisation is an important policy rationale and concept for innovation policy. It promotes efficient, effective and synergetic use of public investments and supports countries and regions in strengthening their innovation capacity, while focusing scarce human and financial resources in a few globally competitive areas in order to boost economic growth and prosperity. It concentrates resources on the most promising areas of comparative advantage [Regions Matter... 2009b]. In terms of the socio-economic context in which the smart specialisation process is understood to operate the smart specialisation argument employs the concept of a domain [Soete 2009]. The basic idea which drives the smart specialisation logic is that entrepreneurs will search out the smart specialisation opportunities within their domain. Therefore, policies which promote such entrepreneurial search processes are to be encouraged.

The smart specialisation concept reflected the implicit assumptions that different countries and regions would tend to specialise in different knowledge-related sectors, depending on their capabilities. At this point the emerging patterns of specialisation in knowledge-related activities were understood to depend primarily on the existing national, sectoral and technological innovation systems, and the interplay between soft and hard capital, as it is these which determine the long-term competitive advantages [Foray 2012]. These systems were therefore also assumed to determine the patterns of interregional and cross-border knowledge and R&D cooperation networks which emerge. If the outcome of the ERA was that a small number of countries or regions increased their domination of all knowledge-related activities, then the ERA will not have served the EU in a manner which consistent with the territorial and social cohesion principles of the Lisbon Treaty.

As such, in terms of the Lisbon growth agenda, smart specialisation was conceived of as a way to reconcile unrestricted agglomeration processes with a relatively balanced distribution of research capacities and capabilities across Europe. Over the last couple of years the role of smart specialisation has become central to economic development and growth policy-thinking in Europe. Smart specialisation has been highlighted by the European Commission as a central pillar of the "Europe 2020 Strategy", as discussed in the recent communication "Europe 2020 Flagship Initiative Innovation Union" and the "EU Budget Review". The Europe 2020 Strategy is intended to act as an umbrella organizing framework under which all EU policies will operate over the coming decade. In particular, the concept has now been highlighted as a central element in the development of a reformed European Cohesion Policy, which is based on the principles of 'smart growth', 'green growth' and 'inclusive growth'. The way in which a smart specialisation strategy is envisaged to operate as a central theme in a post-2013 reformed EU Cohesion Policy is explained in "Regional Policy Contributing to Smart Growth in Europe". The argument is that regions will be required to identify the sectors, the technological domains, or the major arenas of likely competitive advantage, and then to focus their regional policies so as to promote innovation in these fields. In particular, the argument is crucial for the regions which are not on a major science-technology frontier.

The original smart specialisation concept emphasised the importance of R&D, and in particular in high technology sectors. However, as one moves through the nine policy briefs produced by the Knowledge for Growth expert group [The Knowledge for... 2006-2012] it is possible to discern a marked shift away from the early emphasis on R&D, and in particular on multinational R&D, through to institutional and governance issues relating to science, and finally towards technological specialisation based on the adoption, dissemination and adaptation of General Purpose Technologies (GPTs), primarily understood as ICTs, across a wide range of sectors. However, it should be understood that the idea of smart specialisation does not call for imposing specialisation through some form of top-down industrial policy that is directed in accord with a pre-conceived "grand plan". Nor should the search for smart specialisation involve a foresight

exercise, ordered from a consulting firm. It is suggested an entrepreneurial process of discovery that can reveal what a country or region does best in terms of science and technology. That is a learning process to discover the research and innovation domains in which a region can hope to excel. In this learning process, entrepreneurial actors are likely to play leading roles in discovering promising areas of future specialisation, not least because the needed adaptations to local skills, materials, environmental conditions, and market access conditions are unlikely to be able to draw on codified, publicly shared knowledge, and instead will entail gathering localized information and the formation of social capital assets [Forey 2012].

The discovery of specialisation domains has high social value because it helps to guide the development of the region's economy. But the entrepreneur who makes this initial discovery will only be able to capture a very limited part of his investment's social value because other entrepreneurs will swiftly move into the identified domain. Furthermore, entrepreneurial individuals that are well-placed to explore and identify new activities often will not have sufficient external connections to marketing and financing sources and are likely to find themselves in a weak position when negotiating with these external parties for the resources need to expand their young enterprise, reducing their incentives to enter in the first place. Thus there is a potentially serious incentive problem that is not susceptible to resolution by resorting to protection via intellectual property rights. The resulting tendency toward under-investment in this particular type of "discovery process" warrants considering what corrective role can be filled by public policy measures to support greater engagement on the part of locally situated entrepreneurs. As such, in terms of policy logic, the smart specialisation was intended to help the design of policy interventions, such as SME incentives, which promote new inventions via the adoption, dissemination and adaptation of GPT, and specifically ICTs. The shift is from R to D. Beyond trying to address incentive problems, policy makers should accept that their role in selecting the right areas for specialisation may be a more modest one than is usually envisaged when support for infant industries and support for technology start-ups are under discussion. Public entities, universities or other institutions can play an important infrastructural role by providing and collating appropriate information about emerging technological and commercial opportunities and constraints, product and process safety standards for domestic and export markets, and external sources of finance and distribution agencies. Assisting local entrepreneurs to coordinate in forming mutually reinforcing connections and pool generic knowledge that will accelerate this discovery process are considered also as helpful activities [McCann, Ortega-Argiles 2011].

Some examples would be biotechnology applied to the exploitation of maritime resources; nanotechnology applied to the wine quality control, fishing, cheese and olive oil industries; information technology applied to the management of knowledge about and the maintenance of archaeological and historical patrimonies. By so doing, the follower regions and the firms within them become part of a realistic and practicable competitive environment defining an arena of competition in which the players are more symmetrically endowed, and a viable market niche can be created that will not be quickly exposed to the entry of larger external competitors. The human capacities and resources formed by the region, thanks in particular to its higher education, professional training and research programmes, will constitute specialised assets, in other words the regions and their assets have mutual needs and attraction for one other – which accordingly reduces the risk of seeing these resources go elsewhere [Foray et al. 2012].

Smart Specialization strategies

Technical change and innovation have been powerful engines for enhancing 'dynamic' specialisation advantages of firms and industries and constructing 'differences' vis-à-vis competitors, achieving cumulative growth, rents and power. In a period of crisis, specialisation strategies can be conducted in ways that also enhance innovative specialisations and competitive advantages in the post-crisis period, facilitate repositioning strategies and underpin answers to severe global risks (e.g. energy shortage, climate change). Specialisation strategies are based on technical change and innovation and they contain options and policy risks. Therefore, strategies have to consider the heterogeneity of research and technology specialisation patterns in the EU as well as divergent policy goals. Also, a distinct and adapted strategy is required responding to the related risks and opportunities. The policy action should consider a risk management approach and draw on the concept of portfolio management adjusted to RTD policies. External and internal divergences justify different mixes of approaches to specialisation rather than one-size-fits-all strategies.

The EU's strategies are focusing on three major challenges [Giannitsis 2009]:

– to make the EU "the most dynamic and competitive knowledge-based economy in the world",
– to narrow internal discrepancies and enhance convergence,
– to deal with global risks and prevent large systemic risks in areas of major public concern such as energy and climate change.

The issues are complex in their nature and are linking effective governance, coordination of research and technology policy, knowledge building and the shaping of productive processes. In addition, knowledge and technology factors are not related to specialisation in a linear way, making the game of who can create competitive positions complicated. In fact, technology factors are integrated into the different parts of the complete value chain of firms in very different ways. The success depends on how technology inputs interact with very diverse locally available labour forces, capital or other inputs and, in particular, the prices of these. The reality shows that firms can achieve diverse combinations between technology and the various elements of their value chain and construct very different and unpredicted specific or niche competitive advantages. Different goals call for different technology- and innovation-related specialisation strategies. Three main strategies have been identified by Giannitsis [2009]:

1) Strategies for technological leadership (strategies aiming at the frontier),
2) Catching-up strategies for (fast or slow) followers,
3) Preventive strategies to address global risks.

Other types of strategies are proposed by Forey at al. [2011]. They argue that smart specialisation strategies will depend on the regional context and this will often lead to structural change. Some of examples of structural changes derived from different strategies mentioned by these authors are as follows:

– transition: this is the transition from an existing sector to a new one and such a transition is realistic and potentially profitable given the existing commons of that existing industry, i.e, the collective R&D, engineering, and manufacturing capabilities that form the knowledge base for development of the new activity;
– modernisation: this is the technological upgrading of an existing industry, involving the development of specific applications of a General Purpose Technology (ICT, nanotechnology, biotechnology, etc.) to improve efficiency and quality in an existing (perhaps traditional) sector;
– diversification: in such cases the discovery concerns potential synergies (economies of scope, spillovers) which are likely to materialise between an existing activity and a new one. Such synergies make the move towards the new activity attractive and profitable;
– radical foundation of a new domain: the discovery here is that R&D and innovation in a certain field have the potential to make some activities progressive and attractive whereas they were not so before; such radical foundation involves the co-emergence of an R&D/innovation activity and the related (and future) business activity; while some assets are present as well as market opportunities, no industry, or a very weak one, makes it difficult for a knowledge-intensive activity related to these assets to emerge spontaneously.

The implementation of all types of strategy can take a more targeted (pro-active) or a more neutral (re-active) form. In particular, strategies to enhance specialisation in emerging technological fields (type a and b) raise a dilemma between selection and non-selection in the policy-making process. It can be argued that the goal to aim at the frontier and to address global challenges seems to favour a policy mix with more pronounced targeted approaches, while catching-up strategies call for rather more horizontal policy mixes. However, it would be misleading to consider specialisation policies in absolute and/or dichotomic terms. In fact, even neutral policies include selections. What determines the success is the pragmatic mix between active and neutral approaches and the interactions between policy and its environment. Additionally, the more technologically advanced the environment is, the more these strategies coexist within the same national space, as they serve the parallel goals of the same actor. In addition to the production of technology, specialisation policies should also give emphasis to diffusion aspects, which are often underrated. In the presence of weak trickle-down mechanisms, new technologies and knowledge will have a limited success in leveraging new specialisation, competitiveness and growth. Diffusion of technologies, for different reasons, is crucial for both, convergence strategies and strategies aiming at the frontier. Additionally, it needs to be noted that smart specialisation does not prevent regions from maintaining and supporting economic sectors whose knowledge sources and activities are not located in the same region or in readily accessible regions, but may count for a significant proportion of employment in the regional economy. However, these specialisations are more risky in the long term as they do not benefit from the particularisation of the knowledge base and will be more vulnerable to external competition.

Cluster of Innovations in Agribusiness in Mazovia Province

In Poland on 13 July 2010, the Council of Ministers has adopted the National Strategy of Regional Development 2010-2020: Regions, Cities, Rural Areas (NSRD). The NSRD combines together the seemingly contradictory development interests of Poland. Both these related to strengthening the competitive potential of the regions on the national and international scale, as well as interests preventing excessive and socially and politically unacceptable disparities between and within the regions. The new Strategy

answers the challenges that the concept and policy of smart specialization Europe wide developed. Therefore a new model of regional policy was adopted. Its major assumption covers introduction of mechanism stimulating competitiveness on a regional, national and international scale, which will be accompanied by the mechanisms disseminating the development processes from the fastest developing regions to other areas of the country [National Strategy... 2010].

Mazovia Province, similarly to its economic position, is the strongest Polish regions regarding the innovation and R&D activity. The Mazovia 's R&D leadership is remarkable as the region accounts for 43.1% of Polish GERD with almost €1b and 1.07% of the regional GDP spent on R&D, as compared with Polish average of 0.57% in 2007 [Statistical Yearbook... 2010]. Moreover, Mazovia is a leading region in terms of expenditures on innovation activity for product and process innovations by industrial enterprises: In 2008, it spent €1,46b, which accounts for 21% of all Polish innovation expenditures. Out of 1,157 R&D units in Poland (university units and private R&D centres), 335 are located in Mazovia, with conciderable majority of them in Warsaw. In addition, the region has the highest number of employees in the R&D sector: 26% of country's researchers, i.e. 25,489 out of 97,474 (including technicians and supporting staff) of employed in Mazovia. The high research and innovation performance is also reinforced by the fact that more than 20% of all patent applications, and around 26% patents granted in Poland are from Mazovia [Science and... 2010].

However in the EU context Mazovia is far ahead from the EU 27 average with regard to R&D indicators [Regional Innovation 2012]. Thus new Development Strategy for Mazovia with regard to smart specialization has been developed. The vision of Mazovia development is directing Mazovia as a competitive region in a European and global perspective and constitutes a serious challenge for the province in view of Poland's membership in the EU since 2004 as well as ongoing process of globalization, shaping of information civilization and a quick scientific and technical progress. Strengthening the competitiveness of the Mazovia province will contribute to development of many aspects of social and economic life, and consequently to the improvement of living standards of the inhabitants. The aim of the Development Strategy for the Mazovia is to transform the province into a region which will be featured by high competitiveness in relation to other European regions, sustained social, economic and spatial cohesion, high quality of human resources and improvement of living conditions of the inhabitants. The province aims to develop an advanced market economy till 2020 with a dominant position of service sector and will match the highly developed European regions in terms of sectoral structure of employment. It will make the basis for Mazovia to be recognized as one of the major poles of development in Central and Eastern Europe. The branches which serve a knowledge-based economy and the development of information society will constitute a basis for the future economic structure of the province. There will be centres of advanced technologies set up in the region with a clearly outlined specialization based on the leading branches of economy and research, development and implementation infrastructure. As a result the region will be incorporated in the European Research Area and European Area of Knowledge. At the same time, the branches of economy which meeting the needs and aspirations of local communities, will be developed. It is assumed that in Mazovia the transformations in the agrarian sector and rural areas will take place, which will cause a strong decrease of the share of agriculture in the population's income structure. There will be two-way changes in agriculture conditioned by demographic factors and the situation on the job market, taking into account both a leading role of specialized branches of farm production and farms which are inclined to sustainable development. The processes of diffusion of development impulses, different types of innovations, which take place in the region will contribute to the activation of agriculture, rural areas and agribusiness sector [Development Strategy... 2006].

As the researches of Maciejczak [2012] show the Polish agribusiness sector, also in Mazovia region, is at an early stage of building their competitive position and generate development based on knowledge and innovations. Intensifying action is necessary to support the R&D activities of agribusiness companies themselves or their co-operation with research centres. At the same time investments in personnel, not only creating progress, but also the commercializing it in terms of innovation, and then managing them, is a challenge for policy development. It needs to be however noted [Maciejczak, 2010] that with regard to innovativeness of agribusiness sector in Mazovia there is much efforts needed to develop knowledge based approach and fully benefit from innovation diffusion, as the benefits could be multiple [Takács-György 2011]. The ongoing policy works in Poland with regard to strengthening this process assumes selection of so called class-clusters that will serve as engines of development and growth [Raport z czwartego 2012].

To answer to the challenges of smart specialization of Mazovia in 2012 with regard to agribusiness sector there was created at Warsaw University of Life Sciences – SGGW in Warsaw project "Cluster of Innovations in Agribusiness" which received the EU's financial support under the Regional Operational Programme for 2007-2013 for Mazovia (Priority I, Measure 1.6. Promoting cooperative relations on a

regional level). The main objective of the project is to transfer knowledge to the wider business community (science to business – S2B), increase the efficiency of technology and knowledge transfer between the cluster participants, and consequently increase the innovative potential of the region. The project aims to create links of regional corporate functioning within the broader field of agribusiness. Initiation of cooperation within the Cluster will also aim to create an effective policy tool for development, raising levels of innovation and competitiveness of agribusiness enterprises of Mazovia. As a result of the project there will be created an internet platform for innovation in agribusiness, with the goal to provide information that establishes cooperation and implementation of joint initiatives and innovation. In addition, Cluster will provide advisory and consultancy services for the agribusiness industry of the province of Mazovia. The services will be provided in two modules: Food Safety and Food Professional.

Conclusions

The conducted analysis allows to the following conclusions:

1. The R&D based development in the knowledge based economies is driven by creating appropriate conditions to diffusion and co-existence of innovations as a basis for the competitive advantages of countries and regions in a global scale.
2. The concept of smart specialization is a bottom-up approach to accelerate knowledge based development of regions with the assumption for policies to implement a set of strategies aimed on linking entrepreneurial activities in a key competitive areas with the creation, absorption and diffusion of new ideas thought innovations.
3. Mazovia province has a great R&D potential that focused on the agribusiness sector, which plays an important role in the region, could benefit with significant knowledge-based growth. Such development needs to be facilitated institutionally not only from policy support point of view but more importantly from day-to-day activities. The Cluster of Innovations in Agriculture is able to ensure such facilitation and work as a class-cluster for Mazowia's agribusiness development.

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Streszczenie

Przedstawiono analizę warunków i założeń koncepcji inteligentnej specjalizacji zarówno jako koncepcji ekonomicznej wzrostu opartego na wiedzy, jak i rzeczywistego narzędzia polityki rozwoju na rzecz regionów UE do 2020 r. Podjęto również próbę diagnozy województwa mazowieckiego w zakresie możliwości inteligentnej specjalizacji analizując, czy Klaster Innowacji w Agrobiznesie stworzony dla rozwoju sektora agrobiznesu na Mazowszu w oparciu o innowacje odpowiada na wyzwania inteligentnej specjalizacji.

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