Andrzej Piotr Wiatrak

REGIONAL SMART SPECIALISATIONS IN AGRIBUSINESS

It is assumed that regional smart specialisations are a good tool for regional structural transformations, hence the need to provide some insight into how they function. Therefore, the aim of this article is as follows: to provide information on the nature, scope and grounds for the development of regional smart specialisations, with special emphasis on agribusiness. In discussing these issues, the following points are presented: the nature and objectives of regional smart specialisations, the foundations of regional smart specialisations in agribusiness and their analysis, taking selected Polish voivodships as examples. The basis for this article was provided by data processing methods, i.e. analysis and synthesis, and logical inference methods, in particular induction. The examination carried out shows that Poland lacks both a systemic approach to the preparation of smart strategies in voivodships and a sufficient diagnosis of conditions when such strategies are being devised, treating them as a financial assistance instrument or an obligation to implement the EU policy in this regard. The scope of smart specialisations of voivodships covers different areas, mostly economic but also environmental and social spheres, especially if these are interrelated as exemplified by agribusiness. In all voivodships, there are smart specialisations in agribusiness, yet they generally concern sustainable agriculture and environmentally sustainable food processing.

Keywords: innovation, knowledge, partnership, strategy, development.

1. INTRODUCTION

Regional smart specialisations are now one of the instruments to influence the development and structural changes in the European Union. They are based on the strengths and needs of a given region as well as the partnership of interested stakeholders and their development priorities. Their goal is to activate development drivers, implement innovation, bring about structural transformations in regions and increase regional competitiveness. They are prepared by all EU regions, although with varying degrees of success. Such strategies have been developed by all voivodships, but they have not been widely disseminated. Therefore, it is worth considering what can be changed in this regard so that the actions taken foster the building of regional smart specialisations.

Given the topicality of the subject being discussed, including the expected role of such specialisations in regional structural changes, this article attempts to outline these issues systemically, focusing on the nature, scope and grounds for the preparation of regional
smart specialisations, with particular emphasis on the economic sector chosen, i.e. agribusiness. The concentration is on agribusiness because of its role in meeting the basic needs of society, but also its role in the economy of all Polish voivodships. The aim of this study is primarily cognitive, but also – as a supplement – applicative, as it concerns better use of the instrument under consideration. The article draws on the related literature and an analysis of regional smart specialisations in Polish voivodships, including in particular Małopolskie, Mazowieckie and Podkarpackie Voivodships. The basic methods employed include analysis and synthesis and logical inference methods, in particular induction. This study was produced as part of works on the topic “Conditions of innovation policy and its implementation” financed from statutory funds of the Faculty of Management, University of Warsaw.

2. THE NATURE AND OBJECTIVES OF REGIONAL SMART SPECIALISATIONS

The issue of specialisation of countries and regions has been investigated for years from various angles, covering foreign trade, foreign investment, available resources and their use, costs and competitiveness, implemented programmes, strategies and development initiatives (e.g. clusters), etc. These matters are referred to by the concept of smart specialisation, which is one of the tools to implement *Europe 2020 – A strategy for smart, sustainable and inclusive growth* in the EU. “Smart specialisation strategy means the national or regional innovation strategies which set priorities in order to build competitive advantage by developing and matching research and innovation own strengths to business needs in order to address emerging opportunities and market developments in a coherent manner, while avoiding duplication and fragmentation of efforts.” Such an approach stems from the fact that the partnership of stakeholders (especially the key ones) and various policies (e.g. innovation, investment, employment, environmental etc.) are taken into account when devising these strategies and that the policies are directed towards exploiting global competitive advantages.

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The assumptions of this concept are not new and rely on prior solutions, in particular such as:

- the concept of cluster, whereby mutual cooperation of enterprises in a particular sector and also their collaboration with research units and business support institutions promotes specialisation, development and competitiveness;
- the staples thesis, whereby development can be started through production specialisation, i.e. focusing on the products that can be the most competitive in external markets;
- the concept of flexible manufacturing, whereby small and medium-sized enterprises are able to modify production quickly, enter a market niche and adapt to the changes that unfold, thus consolidating a new manufacturing specialisation, particularly through cooperation.

These and other concepts point to the need for cooperation among enterprises and joint action. Cooperation among enterprises will bring better effects if the spheres of science and administration are involved to mutually support each other and compete with others in order to seize the existing opportunities more efficiently. This approach is reflected in the elementary assumptions of smart specialisations:

- establishing a relatively large area of research and innovation to enable effective competition with others and use the economies of scale and scope;
- concentrating activities on those areas of science, research and innovation that will be adequate for the resources and skills of a region and will contribute to the strengthening of its competitive advantages;
- implementing general purpose technologies, such as nowadays: semiconductors, advanced materials, photonics and nanotechnology, which may act as enabling technologies, create opportunities for change, development and application of new technological solutions;
- selecting and implementing smart specialisations not through administration but entrepreneurial discovery, i.e. a bottom-up learning process among entrepreneurs and indicating which areas of science and technology to develop.

The concepts of smart specialisation are smart at least for the following reasons. Firstly, they result from the cooperation of various stakeholder groups, including local stakeholders. Secondly, these strategies are devised through bottom-up learning. Thirdly, the conditions are created to support their elaboration and development through the provision of appropriate information and infrastructure. Fourthly, they promote the implementation of various types of innovation and stimulate private sector investment. And finally, fifthly, all these activities are undertaken in a particular environment that has its own goals and therefore requires a realistic approach to their development, taking into account local strengths and

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capacities and the competitiveness of the environment. This ensues from the fact that the aims of regional specialisations are as follows:

- to make innovation a priority for all regions;
- to develop and implement strategies for economic transformation tailored to regional capacities, abilities and needs;
- to mobilise investment and launch development and innovation processes of an area and change its functional structure;
- to tackle economic, social, environmental, climate, energy etc., challenges facing a region or a part thereof;
- to get partners more closely involved and create synergies through their cooperation.

Summing up, regional smart specialisations may be an idea for implementing innovation policies if they are well prepared and based on:

- the resources of a region,
- areas of its competitive, especially comparative, advantage,
- regional partners,
- the use of public support.

3. FUNDAMENTALS OF REGIONAL SMART SPECIALISATIONS IN AGRIBUSINESS

Innovation is a cornerstone of the functioning of the EU economy. This is emphasised in its subsequent development programmes, including the current ones resulting from *Europe 2020 – A strategy for smart, sustainable and inclusive growth*. The tools for putting these plans into effect are the Innovation Union and the European Innovation Partnerships, which, through the cooperation of various public, social and private actors, undertake actions to implement innovations countering the negative effects of activities to date, especially in the economic sphere. One of the priority areas to be supported is the agricultural sector, which should consume less water, fossil fuels, mineral fertilizers and plant protection products in order to ensure food supply, while making better use of the complementarity between crops and livestock rearing, organic waste management, renewable energy generation etc. It is assumed that “a shift required from the agricultural sector, needed because of increasing urgency for resource efficiency, will result in primarily producing more food in a more sustainable way, but also in supplying a variety of different societal services and bio-based products, related to health, leisure, land management, waste management, feed, fibres and renewable energy.”

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Partnership “Agricultural Productivity and Sustainability” programme was developed with activities focused predominantly on:

1. increased agricultural productivity, output, and resource efficiency to save resources and the environment (especially natural resources), reduce the losses in agricultural production and make use of biological progress;
2. innovation in support of the bio-based economy in the whole food production and supply chain through the promotion of environmentally sound technologies, e.g. integrated biological plant protection, the reduction of greenhouse gas emissions, the use of biomass, bio-fermentation, bio-refinery, recycling etc.;
3. biodiversity, ecosystem services, and soil functionality through improved land management, integrated agro-ecological systems, natural methods of ecosystem protection etc.;
4. development and deployment of innovative products, devices and services, alongside with establishing a sustainable and efficiently managed food supply chain;
5. food quality, food safety and healthy lifestyles – through actions mentioned in the previous paragraphs on the one hand and through information and education in this respect on the other hand.

The actions taken are diverse, but they share an innovative approach that promotes sustainable management in agribusiness combined with the use of biological and ecological drivers of development. At the same time attention is paid to the improved use of organisational drivers of development through production management and distribution systems and an efficient information and monitoring system that enables integration of the various links of the food chain. Organisational drivers of development and innovation implementation in agribusiness also include cooperation and collaboration, among others, at the local and regional levels, where the potential for economic and social dynamics is the biggest. Indeed, it is there that production resources, and above all human resources that determine development, exist. Therefore, it would be beneficial to highlight the existing opportunities for development and investment, to adjust the size of operations and operational methods to production resources held and farming methods preferred (e.g. through application of environmentally friendly technologies) and to motivate the community to use such resources and methods. Consideration should be given to the fact that food- and nutrition-related issues are fundamental, which makes the consensus on development directions so important. The tools for these actions and implementation comprise regional smart specialisations that target a specific area and its resources, including specific and marginal resources linked to agribusiness, to name a few. Simultaneously, smart specialisation strategies, as the preferred mode of action, can both stimulate private investment and foster more efficient and effective use of public funds, together with aid funds. "They can help regions to concentrate resources on few key priorities rather than spreading investment thinly across areas and business sector. They can also be a key element in developing multi-level governance for integrated innovation policies. Moreover they have to be closely linked with other policy domains and

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require an understanding of regional strengths relative to other regions and of the possible gain for inter-regional and trans-national cooperation"\(^\text{14}\).

4. ANALYSIS OF SMART SPECIALISATIONS IN AGRIBUSINESS EXEMPLIFIED BY SELECTED VOIVODSHIPS

All voivodships have prepared regional smart specialisations, addressing their type, scope and implementation method. The analysis of these strategies shows that their names are diverse and mostly refer to specific sectors and areas of activity (e.g. agriculture, bio-economy, energy, or quality of life). All of these strategies contain a reference to agribusiness, though to varying degrees, encompassing all or some of its elements either directly or indirectly – when characterising smart strategies that have been only loosely connected with agribusiness to date (e.g. energy, health, quality of life, tourism). The link between agribusiness and new domains results from the challenges facing the economy and society today but also from the nature of smart specialisations, the aim of which is to enter new areas, improve operational efficiency, and so on.

Smart strategies in the 3 analysed voivodships confirm their diversity and scope, as reflected by the following list\(^\text{15}\):

1. Małopolskie Voivodship:
   - Modern, sustainable agriculture:
     - precision agriculture, automation and process control in agriculture,
     - plant protection methods improving the safety and quality of vegetable raw materials,
     - innovative technologies ensuring the development of animal breeding and biotechnology and health safety of food,
     - modern mechanisation, management, organisation of processing of agricultural raw materials,
     - equipment for harvesting and storing agri-food products that reduces losses in storage and transportation and increases product durability in the food chain,
     - modern methods and tools for monitoring, control and assessment of the quality of vegetable and animal raw materials,
     - technological and IT solutions aimed at shortening the supply chains to consumers,
     - innovative technologies promoting the quality and health-improving properties of food and supporting increased nutritional awareness of consumers,

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– development and implementation of tools, technological and organisational solutions that support the activities regarding the transfer of knowledge from research centres to farming practices and cooperation between entities in the agriculture environment,
– optimising the use of water resources in agriculture.

• “Healthy” food and nutrition:
– food production and food processing technologies for improving the composition and nutritional value of food,
– functional foods and foods for special medical purposes,
– innovative analytical tools and methods for monitoring food quality,
– food packaging, storage and distribution technologies targeted at extending shelf life and maintaining high quality,
– modern solutions for the distribution of high-quality food aimed at shortening supply chains,
– production technologies for food with unique qualities resulting from traditional production methods, including organic and regional food.

2. Mazowieckie Voivodship:

• Safe food:
  – high-quality food and biotechnologies,
  – minimising the impact of agriculture on the environment,
  – using by-products of agri-food production and processing,
  – consumer safety,
  – functional foods (agri-food sector, medical sector, chemical sector, biotechnology)
  – monitoring systems for agri-food production,
  – production automation in agribusiness,
  – management of the food products supply chain.

• High quality of life:
  – advanced dietetics through, inter alia, agri-food sector and biotechnologies.

3. Podkarpackie Voivodship:

• Quality of life:
  – sustainable agriculture,
  – environmentally sustainable processing,
  – production and processing of food of the highest biological and health quality,
  – regional and traditional products.

Agribusiness contains the following elements: agricultural production, agri-food processing, storage and logistics, sales of agricultural products and food, and production of machinery and equipment for agriculture and the food industry. This list suggests that all these elements are present in the investigated smart regional strategies. The sectors and domains covered by specialisation in agribusiness in individual voivodships are varied. Taking into account the frequency of their inclusion, the most important areas of specialisations can be indicated:
– agricultural production,
– food processing,

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safe food and nutrition,
management in agribusiness,
technologies for agribusiness.

Individual agribusiness areas, just like agribusiness elements, are closely related. Smart strategies in the voivodships under examination (but also in other voivodships) most commonly refer to agricultural production and processing of agricultural products. These issues are covered by smart specialisations in all voivodships as such specialisations are targeted at changing production technologies and manufacturing techniques. These strategies focus primarily on technologies that are friendly to the environment but also to people and their health; these are both traditional and modern technologies that allow the application of organic production methods (eco-innovation). Most of them promote modern technologies that enable automation in agribusiness and foster the development of precision agriculture and the use of new equipment for harvesting and storing agricultural products and food. This approach is the result of socio-economic and environmental policies, but is also motivated by the need to protect natural (renewable and non-renewable) resources. This need is reflected particularly in agricultural production due to its connection with the natural environment. Furthermore, given the natural and biological character of agricultural production, special attention should be paid to the organisational order that determines how a farm is organised and food produced, and also how socially responsible and compliant agricultural production is ensured – the issues that are more and more frequently attracting increased attention.

All voivodships have included food processing, although most commonly the emphasis here is on the health aspect of food, extension of food shelf life and its high quality, functional foods and foods for special medical purposes. The third group of smart strategies – safe food and nutrition – is closely linked with the previous groups of strategies and is most often the result of them. Actions to support nutritional awareness raising among consumers may be an additional element.

Management in agribusiness forms another group of smart strategies. The incorporation of management in these strategies is most appropriate since there is much to do in this field in Poland. Such strategies are focused on production management systems, ranging from information and IT systems, through the system of monitoring and control of food production and distribution, to the assessment of the quality of agricultural products and food. Risk management in agribusiness, reducing losses in food production and storage, direct sales etc., are other aspects covered. These activities are aimed at shortening food supply chains, thereby ensuring high quality, and improving management efficiency at the same time.

The last area of smart specialisations, i.e. technologies for agribusiness, is not specifically highlighted in most voivodships. In only a few of them it is present within the field of machinery and equipment as the production of machinery and equipment for agriculture and the food industry (e.g. in Podlaskie Voivodship). Looking at individual smart specialisations, one can reflect on how they will be implemented since many of them refer to implementation of innovative technologies, modern mechanisation, automation in agribusiness etc. – targets which should be achieved through production of machines and equipment for this sector. Therefore, it is worth considering whether these should become a smart specialisation. Concentrating on import solely is a good solution, but for a short period.

The number of smart specialisations for agribusiness in the examined voivodships is relatively large, and indeed they are only a selection from the set of all specialisations. This means that individual voivodships choose too many smart specialisations, although these
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are to be based on priorities. It can be presumed that each voivodship supports existing economic sectors and areas, calling such support smart specialisations. This situation might have resulted from the fact that it was administration that was chiefly involved in the preparation of these strategies in most voivodships, with insufficient participation of other stakeholders (business, research communities and society).

5. CONCLUSIONS

The analysis conducted shows, in particular, that:

1. Smart specialisations – a new instrument of the European Union – may be a significant element of the development of voivodships provided that they set key priorities based on existing resources and community involvement and that their implementation enhances development capacities and competitiveness;

2. The success of specialisation measures depends primarily on the partnership and involvement of stakeholders in the preparation and implementation of these specialisations, including not only businesses but also research units and administration;

3. In Poland, it is administration that still plays the major role in devising smart strategies, with limited involvement of business, universities and research institutes, also because of insufficient dissemination of knowledge about this development instrument and its advantages;

4. What is also missing is both a systemic approach to the preparation of smart strategies in voivodships and a sufficient diagnosis of conditions when such strategies are being devised, with them being treated as a financial assistance instrument or an obligation to implement the EU policy in this regard;

5. The scope of smart specialisations of voivodships covers different areas, mostly economic but also environmental and social spheres, especially if these are interrelated as exemplified by agribusiness;

6. In all voivodships, there are smart specialisations in agribusiness, yet they generally concern sustainable agriculture and environmentally sustainable food processing – as an effect of the European Innovation Partnership implemented in the European Union countries;

7. There are no regional smart strategies for the production of machinery and equipment for agriculture and the food industry, while structural changes in agribusiness rely on new technologies and their application;

8. The number of smart strategies in voivodships, including for agribusiness, is relatively high, which may indicate that some of them are smart in name only;

9. Actions for promoting smart strategies in agribusiness should be continued in the future, as they concern issues linked with food security of the country and voivodships. Therefore, this development mechanism is worth disseminating, as is promoting the Innovation Partnership.

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**REGIONALNE INTELIGENTNE SPECJALIZACJE W AGROBIZNESIE**

Przyjęto założenie, że regionalne inteligentne specjalizacje są dobrym narzędziem przemian strukturalnych regionu, dlatego istnieje potrzeba przybliżenia ich funkcjonowania. W związku z tym cel artykułu określono następująco: przybliżenie istoty, zakresu i przesłanek przygotowywania regionalnych inteligentnych specjalizacji, ze szczególnym uwzględnieniem agrobiznesu. Omawiając tą problematykę ukazano kolejno następujące zagadnienia: istotę i cele regionalnych inteligentnych specjalizacji, podstawy regionalnych inteligentnych specjalizacji w agrobiznesie oraz ich analizę na przykładzie wybranych województw. Podstawą wykonania artykułu były metody przetwarzania danych, tj. analiza i syntez oraz metody wnioskowania logicznego, a zwłaszcza indukcja. Przeprowadzona analiza wskazuje, że w Polsce brakuje systemowego podejścia do przygotowania inteligentnych strategii w województwach, nie przeprowadza się dostatecznej diagnozy uwarunkowań przy ich opracowaniu, a traktuje
się je jako instrument pomocy finansowej lub obowiązek realizacji polityki unijnej w tym zakresie. Zakres inteligentnych specjalizacji województw obejmuje różne obszary, naj-
częściej dotyczące sfery gospodarczej, ale także sfery środowiskowej i społecznej, zwłaszcza
jeśli są ze sobą powiązane, czego przykładem jest agrobiznes. We wszystkich wo-
jejewództwach są inteligentne specjalizacje dotyczące agrobiznesu, przy czym najczęściej
dotyczą one zrównoważonego rolnictwa i ekologicznie zrównoważonego przetwórstwa
żywności.

Słowa kluczowe: innowacje, wiedza, partnerstwo, strategia, rozwój.

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