Roman Chorób

Determinants of development of innovative integration links between agriculture and food industry

Selected issues

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Determinants of development of innovative integration links between agriculture and food industry. Selected issues (on the example of Podkarpackie Province)

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This book is dedicated
to my beloved wife Elżbieta
for her invaluable support, reassurance
and time devoted to children
during my drafting this monograph

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INTRODUCTION

Agribusiness is a part of economy where is the greatest potential for development of any integration links. Integration processes in agribusiness give rise to advantages and certain limitations in the decision making process. They can be considered from the point of view of the integrator and integrated farmers, but also from the point of view of integration systems (vertical and horizontal) and the entities outside these systems, e.g. processing plants not engaged in contractual vertical integration or the farmers outside the producer group.

In the effective development of farms in the region and local food industry units the important role is played by integration relations – the more advanced they are, the better the development of these entities. Adaptation to the market economy and the integration links occurring between the above-mentioned entities can take many forms and can proceed at a different pace and in a number of ways. The course of these processes depends on many factors such as the size of the farm and the structure of land use, the purpose and direction of production, the production capacity of the food industry, the rules of conduct in relations between the participants of market relations, the scope and intensity of state intervention and so on.

The membership of Poland in the European Union significantly affects the situation of agricultural commodities producers and processors and many other economic entities. The accession to the EU is associated with the increase of competition in the agri-food market, both from producers of the raw material as well as from its processors. The chances of Poland on the markets of other member states should be sought in reducing the impact of large fragmentation of farms of agricultural producers through the creation of structures integrating farmers, enabling rationalization of production and marketing of agricultural products. It is evident that proper development of processes of vertical and horizontal integration can help to achieve a better market position of the Polish producers of agri-food products.

Conducting the research, data analysis, elaboration of results, preparation and translation of this study was done within the realization of the author's individual research project entitled: *"Determinants of development of innovative forms of integration links between agriculture and food industry"* funded by Narodowe Centrum Nauki *(National Science Centre)* (DEC-2011/01/D/HS4/03911).

The subject of research, and also the aim of this study is to analyze the determinants of the development of integration links between agriculture and food

industry, their various forms occurring in the Podkarpackie Province and to present the opportunities, limitations and prospects for their expansion. The undertaken issues are extremely important in this area due to large fragmentation of farms. The development of exchanges and wholesale markets and the enterprises operating in food industry will force the need to provide large batches of uniform, high-quality agricultural produce. Meeting these requirements is possible due to various forms of cooperation of agricultural producers, agri-food processing units, as well as other units of agribusiness.

Specifying the essential, cognitive objective of the research, there were put forward hypotheses which will be the subject of further detailed consideration. The conducted research will aim at logical and empirical verification of these hypotheses in which it was assumed that:

- the entities of food industry and agricultural producers entering into integration links are more likely to offset adverse fluctuations of the market game parameters;
- there is a positive correlation between the state of advancement and the form of integration links and the level of competitiveness of agriculture and food processing;
- the barriers to the participation of agricultural producers in integration links are the capabilities of quantitative and qualitative reactions which are determined by the level of income gained from agricultural production and the conditions of the natural environment;
- the development of innovative forms of integration links between agriculture and food industry is determined by many factors, and in particular by the economic condition of the company/farm, the will to cooperate and the level of trust between potential participants of the integrated system;
- the nature of the region, with a particularly high share of agriculture, is a positive condition for the development of cluster structures, particularly in the agri-food sector;
- weakness of integration links is a barrier to functioning and development of processing in the analyzed area, there is therefore a need for strengthening the market position of agricultural producers which is seen in the expansion of cluster initiatives, which requires support from the government, local government and agricultural organizations.

Research hypotheses were verified in three parts which were not formally separated in the structure of this study. The first of them, including the first chapter, is focused on theoretical issues characterizing the importance of integration links in food production and it presents different forms of vertical and horizontal integration in food economy.

The subject of the discussion carried out in the second part of the study, including the second and third chapters, is an overview of the concept of innovative integration links and main factors of development of cluster initiatives and structures.

When making the inspection of the idea of clustering there was included the genesis of this concept, the review of legal forms, benefits, advantages and limitations of functioning of cluster structures. There has also been made the characterization of economic and institutional factors determining the development of cluster initiatives. The deepening of the discussion carried out is the characterization of the policy of support, as well as of the opportunities to develop cluster initiatives in the agri-food sector.

The third part covers the fourth and fifth chapters in which the subject of the discussion are the determinants of the development of cluster initiatives in Podkarpacie in the light of the opinion of agricultural producers and representatives of food processing entities. In this part of the study there are presented the microeconomic conditionings of the development of integration links, and especially the links between the state of advancement of these connections and the selected variables that characterize the processing entities and agricultural producers. There was also made the assessment of the state, opportunities and limitations to the development of cluster structures, taking into consideration the specific nature of agri-food industry in the region. In the final part of the study recommendations were made, as well as attempts to outline the prospects and directions of development of agri-food clusters in Podkarpacie.

The undertaken research on integration links between agriculture and food industry are among challenging issues and are not often undertaken in the economic and agricultural literature. Due to the complexity and multifaceted quality of the above problems, the undertaken issues may be the subject of further, separate studies.

The time range of the considerations presented in this work mainly covers the years 2005-2013, i.e. the period of Poland's full membership in the structures of the European Union. However, in many cases, the basis were the data collected under the Common Agricultural Censuses conducted in 2002 and 2010 which present the detailed issues concerning agriculture in the studied region. The assessment of spatial differentiation of the stage of advancement of integration links concerns the years 2005 and 2013, and the district was assumed as the basic territorial unit. In this case, for the year 2005 there were analyzed the results of the studies conducted earlier among 500 agricultural producers, while for the year 2013 there were used the results of the studies carried out on the same research sample within the realization of the above-mentioned research project.

Since the research on integration links between agriculture and food industry are mainly of empirical character, the really important issue is the availability of the relevant figures. The basis for the economic and statistical analyses were source materials from the publications of: Central Statistical Office, Statistical Office in Rzeszów, Podkarpackie Agricultural Advisory Centre in Boguchwała, Chambers of Agriculture. In the course of conducting the research works there were also used the data compiled by the Institute of Agricultural Economics and

Food Economy and the Institute of Cultivation, Fertilization and Soil Science. The materials describing the qualitative issues came mostly from the available literature on the subject.

The main part of the source materials were the results of surveys carried out in the years 2013 and 2014 for which there were used the questionnaire and in-depth interview. In total the survey covered 500 agricultural producers running farms in the area of Podkarpacie Province (who deal with commodity production) and 200 leading (according to PKD *(the Polish Classification of Activities)*) food industry enterprises dealing with processing of meat, milk, cereals and fruit and vegetables.

A valuable supplement to this paper is the authorial monograph published in Polish entitled.*: "Conditionings of development of innovative forms of integration links between agriculture and food industry. Selected issues"*, describing in more details the undertaken issues, as well as showing other aspects of the analyzed issues, with particular emphasis on agro-industrial clusters functioning in Podkarpacie.

Conducting the analysis of integration links sometimes requires using the data of a considerable degree of detail. The source data published in various studies are not always complete as well as not fully comparable. This is due to frequent changes in the method of conducting statistical reporting. Therefore, to ensure the comparability of certain data, there were assumed some simplifications and estimated conversion, in effect of which the obtained results and detailed conclusions may be subject to some error.

CHAPTER I

CONNECTONS AND FORMS OF INTEGRATION IN FOOD ECONOMY

1.1. The essence of integration links

Integration (from Latin: *integratio* – complement and *integer* – complete) means to form a whole from separate parts, and to integrate (from Latin: *integrare* – complete) means to combine into a single whole, to compose from parts[1]. According to the encyclopaedic dictionary[2] integration is fusion, merging, creating entirety from parts. It is therefore a term used in the field of different sciences and walks of life. One may talk about the integration of a group, society, nation, state, system of concepts, ideas, economic, political or regional integration, or the integration of agriculture or economic entities. Integration is therefore a process consisting in strengthening the connections between the links in the national economy in such a way that these links form a coherent whole[3]. In each case the integration means a process of creating a new quality, structure, therefore it is not a simple combination of elements that may be easily disintegrated. Therefore, the effectiveness or success of such a process must take into account the factor of goodwill or naturalness of needs, mechanisms leading to integration. Today, the concept of integration has become one of the most important terms used to describe international relations in connection with the formation and disintegration of different forms of not only economic cooperation.

Integration may occur in all sectors of economy. From the perspective of direction there are two principal forms of integration: vertical and horizontal; sometimes it is also said about diagonal integration, i.e. crosswise. Both the vertical and horizontal forms of integration have one thing in common: they may significantly affect the reduction of costs of production and distribution of integrated economic activity and, consequently, increase the competitive strength of the integrated companies.

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[1] *Słownik wyrazów obcych,* PIW, Warszawa 1967, p. 297.

[2] *Unia Europejska – słownik encyklopedyczny,* W. Głuch (ed.), Wyd. Europa, Wrocław 2003, p. 91.

[3] J. Małysz, *Procesy integracyjne w agrobiznesie*, Fundacja Programów Pomocy dla Rolnictwa FAPA, Warszawa 1996, pp. 55-65.

Adopting the stage of advancement as a criterion of division there are differentiated full integration and indirect integration. Full economic integration occurs when there takes place joining (merger) of two or more enterprises carrying out a specific type or successive stages of economic activity and leads to the formation of one large participant in the market. Indirect economic integration is brought about by contractual connections under which the individual partners retain their formal, legal and, in a limited scope, economic independence[4].

In food economy, integration is an economic concept covering economic processes consisting in combining under one management all or part of economic decisions divided so far between different economic entities. Integration may concern companies, farms and then we can talk about integration at the microeconomic level. It may also concern branches and sectors of the national economy, and even entire economies of individual states, and then it is integration at the macroeconomic level. Actual integration occurs when all participants of the integration group gain economic benefits.

Integration in the food sector consists in developing internally coherent economic structure which is necessary for production of food. The integration process can also be widely understood as the formation of a separate economic subject covering groups of branches distinguished from the whole of the national economy and creating a complex associated with production and refinement of food. Integration is a dynamic phenomenon as there is a change of the nature of links between the subjects creating the integration system. Loose unilateral relations are transformed over time into a complex combination of connections and interdependencies[5].

Significant opportunities for development of any integration links exist in agribusiness which is an essential part of the national economy[6]. Integration processes initially included industry where integration meant concentration of capital and production in the form of large corporations formed through a merger, amalgamation, buyout or absorption of smaller enterprises. Currently, they include all the links, from food production to its consumption. The issue of integration links between agriculture and processing is a particularly complex issue, and it is indicated by many authors[7]. The occurring vertical integration between agriculture

[4] B. Wyrzykowska, *Rodzaje powiązań integracyjnych w agrobiznesie,* Zeszyty Naukowe SGGW w Warszawie, Seria Ekonomika i Organizacja Gospodarki Żywnościowej, 2004, nr 53, p. 57.

[5] E. Bąk, *Znaczenie związków integracyjnych rolnictwa z otoczeniem instytucjonalnym na rynku wołowiny i cielęciny*, Roczniki Naukowe, SERiA, Tom 1, Zeszyt 2, Rzeszów 1999, pp. 208-209.

[6] E. M. Sawicka, *Związki integracyjne rolnictwa z przemysłem spożywczym i handlem rolniczym (charakter, istota, znaczenie)*, Roczniki Naukowe, SERiA, tom 1, zeszyt 2, Rzeszów 1999, pp. 335-339.

[7] Cf. J. Małysz, *Procesy integracyjne w agrobiznesie,* SGH Warszawa 1996; A. Ostromęcki, *Czynniki warunkujące rozwój integracji pionowej w rolnictwie górskim regionu karpackiego,* Wyd. AR w Krakowie, Kraków 2001; J. Piwowar, *System integracji rolnictwa z przemysłem spożywc-*

and food industry is in fact a process of merging two different phases of food production process, namely the productive and processing ones.

In addition to the interconnections, all links of agribusiness (excluding households) are connected with the global economy. A large part of the national economy therefore works to prepare the production of food raw materials, to produce and process these raw materials in food and deliver it to consumers., Therefore, there can everywhere exist links of integration character because their existence determines whether we are dealing with links of production and distribution of food combined into system, or with loose links with a low total efficiency[8].

In this study, integration is understood as both a process and a state of affairs. It is a microeconomic integration as it consists in combining under one management all or a part of economic decisions divided so far between different economic subjects, i.e. processing companies and farms. As a result of these actions all participants in the integration chain can achieve economic benefits, the scale of which is dependent on a number of internal and external conditions affecting the functioning of the integration group. Integration understood as a state of affairs is a static conception, and as a process it is a dynamic phenomenon. The dynamic nature of integration was emphasized by E. Bąk who wrote that with passage of time there changes the nature of links between the subjects belonging to this group, and loose relations over time may develop into advanced relations and strong interdependencies[9].

In the above understanding integration differs substantially from the concept of co-operation which mostly means widely understood cooperation in quantitative terms. Sharing the view of A. Zalewski[10], it should be rightly noted that integration is a state and process qualitatively different from cooperation. It is worth emphasizing that these concepts can take identical or similar, and sometimes even contradictory meanings. While agreeing with the mentioned author's approach to this issue, between cooperation and integration there are significant differences since cooperation means in principle a widely understood collaboration, and its scope includes mainly quantitative categories, whereas integration means changing the qualitative form of management[11].

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zym w Polsce, Politechnika Radomska, Radom 1996; J.J. Reimer, *Vertical Integration in the Pork Industry*, American Journal of Agricultural Economics 2006, nr 2; G. Ziggers, *Vertical Coordination in Agribusiness and Food Industry: The Challenge of Developing Successful Partnership* [in:] in. G. Galizzi, L. Venturini (Eds.), *Vertical relationships and coordination in the food system*, Heidelberg-New York 1999.

[8] J. Małysz, *Procesy integracyjne w agrobiznesie*, Centrum Doradztwa i Edukacji w Rolnictwie, Poznań 1996, pp. 5-7.

[9] E. Bąk, *Znaczenie…op.cit*., pp. 208-209.

[10] A. Zalewski, *Problemy gospodarki żywnościowej w Polsce,* PWN, Warszawa 1989, pp. 15-17.

[11] R. Chorób, *Możliwości rozwoju powiązań integracyjnych rolnictwa z przemysłem spożywczym*, Prace Naukowe Wydziału Ekonomii Uniwersytetu Rzeszowskiego, Seria: Monografie i Opracowania nr 9, Wyd. Uniwersytetu Rzeszowskiego, Rzeszów 2010, p. 17.

Analyzing the views of J. Famielec[12] concerning issues related to integration it should be noted that the concept of cooperation is not clearly understood and perceived in the literature and economic practice. It should be also expressly stated here that the relations based on cooperation agreements are a form of economic integration. Moreover, as the mentioned author rightly notes, the creation of cooperative and concentration relations is usually subordinated to a strategy of vertical or horizontal integration, or their combinations.

The main part of this study concerns the indirect form of integration developed mainly through the relations of contract nature, within which individual partners to the integration relation retain their formal and legal independence, and to a limited extent also the economic autonomy. It is worth noting that the effectively functioning above-mentioned form of integration can, to a crucial extent, stimulate the development of full economic integration whose aim will be to create a significant market participant bringing together the entities pursuing a specific type or successive stages of economic activity.

1.2. Specific features of agricultural and food markets

The agricultural market, like the food market, is an integral part of the entire market of goods and services[13]. In the literature one can find many more or less complex definitions of agricultural and food markets.

According to B. Wojciechowska-Ratajczak the widely understood agricultural market covers the exchange of goods and services, money flow (capital market), flow of labour resources (labour market) and land management (land market)[14]. However, in the narrow, most commonly used sense, it covers the market of agricultural products, market of means for agricultural production and market of production services for agriculture. A similar opinion is presented by S. Makarski who believes that the agricultural market is sometimes understood in narrower and broader sense[15]. In the narrower sense it is defined as the market of agricultural products, i.e. the whole of transactions of purchase and sale of agricultural

[12] J. Famielec, *Układy kooperacyjne w przemyśle*, Wyd. AE w Krakowie, Kraków 1988, pp. 8-9.

[13] Definitions of *market* can be found, among other things, in the publications: J. Altkorn, *Podstawy marketingu,* Instytut Marketingu, Kraków 1992, p. 90; J. Fereniec, *Zarys ekonomiki i organizacji rolnictwa,* cz. 1, WSRP, Siedlce 1997, p. 148; M. Sznajder, A. Trębacz, G. Adamczyk, *Rynek rolny*, AR Poznań, 1997, p. 15; W. Wrzosek, *Badanie i kształtowanie rynku,* SGPiS, Warszawa 1983, p. 7; M. Zalesko, *Instytucjonalizacja rynku rolnego w Polsce*, Wyd. Wieś Jutra, Warszawa 2006, p. 13.

[14] B. Wojciechowska-Ratajczak, *Rynek rolny* [in:] A. Woś (ed.), *Encyklopedia agrobiznesu,* Fundacja Innowacja, Wyd. 1, Warszawa 1998, p. 777.

[15] S. Makarski, *Funkcjonowanie rynku rolno-żywnościowego*, Wyd. UMCS w Lublinie, Lublin 1998, p. 15.

products. In the broader sense it additionally includes the turnover of production means and services for agriculture.

According to E. Misiak the agricultural market is the whole of exchange and commodity-money relations individually established between the subjects who buy and sell agricultural raw materials, their products, means for agricultural production and production services[16]. In other words, the concept of agricultural market is understood as the whole of commercial relations (purchase and sale) concerning the supply of agriculture, sales of agricultural products and also their conditions. A similar view is presented by T. Nawrocki who defines the agricultural market as the whole of exchange and commodity-money relations occurring between the subjects who sell agricultural raw materials and products and purchase means for agricultural production and investment goods and the subjects who deal with purchasing agricultural raw materials and products and supplying farms with a variety of means for production[17].

S. Urban and K. Szlachta give definitions of the agricultural and food markets pointing to their specific characteristics. The agricultural market in this sense means the whole of exchange relations between the farms that sell agricultural products and acquire means for agricultural production and investment goods and the enterprises that purchase agricultural products and supply farms with the goods required for agricultural production. The agricultural market also includes the direct sale of agricultural products by farmers to consumers and other forms of sales of agricultural products. In contrast, the food market, according to the mentioned authors, "covers the whole of commodity flow of food products from the producer to the consumer including the processing phase and is the sum of trade markets of all food products"[18].

The agricultural market is subject to the needs of development of agriculture as a sector of the national economy. It is responsible for coordinating the development of agriculture with other sectors of the national economy. The level of its development and its organizational structure to a large extent depend on the degree of industrialization and urbanization of the country. Particularly important is the efficiency of functioning of agricultural produce markets. It determines the degree of satisfying the food needs of the country at a given level of income of population and given resources of production factors. It is worth noting that in recent years in the Polish agri-food market there has been increasing the importance of functions connected with refining the products and their adaptation to the needs and requirements of the end consumer.

The agricultural market is characterized by specific features which distinguish it from other markets. The features mainly include:

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[16] E. Misiak, *Wprowadzenie do ekonomiki obrotu rolniczego,* AR Kraków, 1980, p. 11.

[17] T. Nawrocki, *Rynek rolny i jego elementy* [in:] K. Łęczycki (ed.), *Przedsiębiorstwo w agrobiznesie*, Wyd. Akademii Podlaskiej, Siedlce 2003, p. 57.

[18] S. Urban, K. Szlachta, *Ekonomika i organizacja handlu żywnością*, Wydawnictwo AE Wrocław 1995, pp. 27-30.

— the risk dependent on changes of weather and economic conditions,
— seasonality of agricultural production connected with seasons,
— subjects acting simultaneously as purchasers and sellers of foodstuffs or other products,
— direct connection of production with consumption,
— low elasticity of supply of agricultural raw materials resulting from long cycles of agricultural production,
— alternation of periods of overproduction and low prices with periods of low production and high prices.

The characteristic tendency of the agricultural market is the systematical growth of importance of the function connected with refinement of products consisting in a preliminary or full processing of produce and preparing it to better meet the needs of the final recipient. In time, the special feature of the contemporary agricultural market is also the increase of integration processes, concentration and specialization. With integration and concentration of the market there is also connected the integration of technical equipment, i.e. the technical base for the functioning of the market. Therefore it becomes crucial to optimize the spatial structure of the market, namely: the number of outlets or plants, their sizes, location, interconnections, etc. These factors considerably influence the efficiency and effectiveness of functioning of the entire market.

Summing up the above considerations it should be concluded that the agricultural market is characterized by relatively low transparency and high unpredictability. From the point of view of agricultural producers these features are critical because they determine the actions relating to the production potential, the size and structure of agricultural production. Due to the natural risk characteristic for agricultural production, agricultural producers are entitled to expect from a closer or further surroundings fairly certain and predictable conditions for production or sale of agricultural products.

The specificity of the agricultural market substantially affects integration links between agriculture and food industry. The development of agriculture, according to L. Mączka, should be subordinate to satisfying a specific market demand for products both in the current year as well as in the longer term. Feasibility of this demand to a particular extent becomes dependent on investments of productive character[19]. Variability of the supply of agricultural produce reduces rhythmicity of the supply of processing industry with raw materials, hindering strategic planning in the sphere of production of finished goods destined for market. Thus, the rigidity of supply in short periods increases the certainty of supply with the appropriate quantities of raw materials in one production season. The process of integration of agriculture with food industry reduces fluctuations in supply and prices, and thus integration can stimulate transformations in the market of agricultural commodities.

[19] L. Mączka, *Model powiązań pomieszczeń inwentarskich ze stanem pogłowia zwierząt gospodarskich w indywidualnym rolnictwie w Polsce*, Wyd. AE w Krakowie, Kraków 1990, p. 9.

1.3. Motives for development of integration links in market economy

The main economic impulse for entities entering integration systems is the expectation of significant, additional benefits beyond those achieved from participating in the market game acting as a non-integrated subject. The source of additional benefits may be an increase in the scale of production, strengthening the position in the market and joint marketing, risk sharing, contractual guarantees concerning the timeliness and quality of supply with raw materials, rational planning[20].

The scale of the benefits expected by the subjects entering integration systems is directly affected by the proportions between such factors as: current and future market prices, the manner of division of profits or finally the form of regulation of market exchange applied by the state. As R. Przygodzka says, the most important determinant of "the size of the state in economy" is the type and form of the state, on which depends the adoption of the dominant method of allocation of economic resources, division and exchange, and characteristic expression of the state's influence on economy is the economic policy it realizes[21]. It is worth noting, however, that in the system of market economy there are always market niches where there functions the free-market game – an example can be commodity exchanges, auctions, fairs, where there takes place direct confrontation between many participants of the market game.

The level of benefits of integrated companies is affected by both the factors affecting from the supply side as well as from the demand side. The supply is determined by types and volumes of production of raw materials for processing industry and finished products and their quality. The increase in the amount of raw materials of the desired quality increases and diversifies the offer of food industry. However, an uncontrolled increase (e.g. oversupply in the years of harvests) leads to a drop in prices of raw produce and final products. In contrast, improving the quality mostly makes it possible to achieve greater benefits[22].

The volume of production, its quality, type of raw materials and products are determined by production technologies, technical and biological progress, instability of natural factors and variability of economic conditions. Processing companies and agricultural producers integrated with them shape the supply of products in the market. The market provides information on expected prices and demand for food, which information is the basis for the integrated system to determine the volume and structure of production: agricultural raw materials by farmers and foodstuffs by food industry companies.

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[20] J. Piwowar, *System ...op.cit.*, p. 53.

[21] R. Przygodzka, *Fiskalne instrumenty wspierania rozwoju rolnictwa – przyczyny stosowania, mechanizmy i skutki*, Wyd. Uniwersytetu w Białymstoku, Białystok 2006, pp. 32 and 65.

[22] J. Piwowar, *System ...op.cit.*, pp. 54-55.

Sometimes the subjects operating in the integrated system have a significant impact on the demand in the area of joint action. Through the use of the common marketing concept they can introduce competitive prices compared to the prices of finished products coming from non-integrated subjects. The determined level of prices is slightly dependent on the integrated system's position in the market, therefore it becomes more important to use many marketing tools, e.g. promotional prices, discounts or abatements at the purchase of large consignments[23].

Food industry subjects and agricultural producers when participating in integration relations have more opportunities for eliminating, adverse for them, fluctuations of the market game parameters. Significantly important in this respect become endorsements of guaranteed prices and their limits, obligations of the parties to the timely completion of purchase-sale at prearranged volumes and time of realization, technological and qualitative requirements, as well as loyalty of the subjects in the integrated system.

An important action for both parties is to search for market niches by an in-depth analysis of the existing market and gaining potential new markets, replacing outdated manufacturing technologies with modern ones, continuous adjustment of the level and costs of production to the market requirements. In contrast, the efficiency of action is enforced by the market mechanism. Failure to comply with its requirements may result in loss of at least a part of the benefits which are the basis for distribution of the profit of the integrated system[24].

The market mechanism verifies the effectiveness of functioning of the integrated system subjects, although integration links and state intervention into market relations modify the whole of conditions of this activity. The variability of market situations as well as the instruments of interventionism at a relative stability of agreements within vertical links makes the whole system of mutual dependences become extremely complex, and the result of the summation of regulations practically difficult to predict[25].

One of the most distant forms of state interventionism in agriculture is imposing various kinds of tax burdens on farmers, both in a natural as well as financial form[26]. The transition from state interventionism in the form of imposing burdens on farmers and the transfer of income from agriculture to other sectors and state authorities to such forms of interventionism that primarily consist in promoting agriculture and net transfer of income to agricultural producers is a turning point in the history of state interventionism.

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[23] B. Nogalski, R. Ronkowski, *Współczesne przedsiębiorstwo – problemy funkcjonowania i zatrudniania*, Towarzystwo Naukowe Organizacji i Kierownictwa, Stowarzyszenie Wyższej Użyteczności „Dom Organizatora", Toruń 2007, pp. 51-56.

[24] J. Piwowar, *System ...op.cit.*,p. 57.

[25] J. Piwowar, *System ...op.cit.*, p. 61.

[26] Cf. R. Przygodzka, *Fiskalne... op.cit.*

With regard to integration processes the positive effect of interventionism for integrated links is, first of all, the stabilization of benefits resulting from market exchange. Thus, there is limited the economic risk of the activity carried out by farmers, and the processors may increase the effectiveness of strategic planning. A stable market reinforces the rules of division of the benefits from the exchange between the integrated parties. Conflicts of partners or unwillingness to enter into integration links, the uncertainty of fulfillment of concluded contracts cease to be a barrier to the development of integration processes. The negative side of interventionism stabilizing market parameters, however, is limitation of entrepreneurship of the integrated subjects. A stable market means there is no opportunity for entrepreneurs to achieve gains resulting from changes in prices and resulting from their creativity. Adverse effects that may arise for the integrated system are of short-term nature, they manifest in a certain loss of volume of profit and limitation of freedom to choose business domain. In the long term the use of such instruments as preferential loan, subsidies for technological progress, supporting the development of market infrastructure, etc. is not only beneficial, but it is the foundation for developing cooperation within the framework of vertical integration[27].

Food processing industry, responding flexibly to market needs, pursues significant assumptions of state interventionism related to the stability of food economy. By its influence it affects the productivity of factors of production, the increase of the scale of production and its technological reconstruction, by which it enables the achievement of economic objectives of integrated subjects. In an indirect way it is the premise of creating socio-professional structures in rural areas. Strengthening the position of agriculture in integration processes may be connected with an increase in the number of rendered preproduction and post-production services. Integration links transforming over time into integration processes may bring reduction of the need for state interventionism, although it should be noted that the scale of the impact of the subjects of the integrated system is incomparably smaller and cannot affect the whole of the market game. Despite the fact that in some produce markets it is possible, ultimately there remains the unresolved question whether financial support for integration relations allows obtaining better results than the classical state interventionism, or whether it should be only a systemic complement of the impact on agribusiness.

1.4. Typology of integration links

Integration links occur in all sectors of economy. Taking direction as a criterion of division there can be distinguished vertical integration, meaning connecting and subjecting to the joint management of the individual phases of the

[27] A. Ostromęcki, *Czynniki...op.cit.*, pp. 62-63.

production process, i.e. connecting all links from the raw material to the finished product, and horizontal integration, which in turn consists in increasing the scale of production by integrating independent economic subjects, i.e. creating relations between the group of the same or similar production units[28].

Depending on where the integration impulse comes from, the vertical integration can be divided into the integration directed backward and the integration directed forward[29]. V. Saccomandi from the point of view of the direction of its development distinguishes not only the vertical integration directed backward, the vertical integration directed forward, but also the horizontal integration[30]. The top-down integration (directed backwards) consists in the entrance of commercial or industrial capital, as an integrator, to agriculture. The farm becomes then subordinate to the integrator, in return, however, the integrator takes over all or a part of the market risk. The bottom-up integration (directed forward) consists in taking over the role of the integrator by horizontal relations of farmers, usually their cooperatives or capital companies. Examples of this type of integration are marketing groups and economic products produced by agricultural cooperatives in both the processing industry as well as in gastronomy. This type of integration is generally considered to be a form that better reflects the interests of farmers and strengthens their position in the integrated system.

Due to the form of development of vertical integration links emerging between economic subjects we can distinguish the following types of integration:[31]

- capital integration (through the acquisition of the title and the start of production of food raw materials);
- legal integration (through the establishment of legal norms by the state when the state determines the manner of connecting from the point of view of set priorities, for example, supporting with subsidies for producer groups);
- contractual integration (consisting in concluding a contract, i.e. the system of agreements that exist between the suppliers of raw materials, their producers on the recipient's order, and the integrator).

J. Małysz yet distinguishes the fourth form of integration links, namely the strategic links (strategic networks)[32]. These links are established as a result of the partnership agreement of two or more companies that hold a strategic position in the integration chain. The strategic relation is to ensure production of the final

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[28] J. Małysz, *Procesy integracyjne w agrobiznesie (ABC integracji),* CDiEwR, Poznań 1996, pp. 8-14.

[29] J. Małysz, *Procesy integracyjne w agrobiznesie,* SGH, Warszawa 1996, pp. 5-16.

[30] V. Saccomandi, *Agricultural Market Economies. A neo-Institutional Analysis of the Exchange, Circulation and Distribution of Agricultural Products*, European Perspectives on Rural Development, Van Gorcum, Assen 1998, pp. 198-199.

[31] *Encyklopedia agrobiznesu,* A. Woś (ed.), Fundacja Innowacja, Wyd. 1, Warszawa 1998, pp. 387-391.

[32] J. Małysz, *Integracja w agrobiznesie* [in:] *Encyklopedia agrobiznesu…op.cit.,* pp. 387-391.

product of increased competitiveness (lower processing costs, lower transaction costs, higher quality).

In contrast, T. L. Sporleder defines strategic links as "arrangements between or among companies in order to cooperate to achieve the strategic goal"[33]. The author concludes that the strategic links that just appear are a form of corporate partnering; these links have not yet been satisfactorily defined.

In turn, M. O'Keeffe discusses the concept of strategic networks which he identifies with the concept of strategic links. According to him "one of the key challenges in agribusiness is to understand the partnering and competitive dimensions of various relations along the chain of values and to develop systems that create trust and prolong the prospect, reduce short-term actions and minimize opportunism"[34]. The network approach perceives competition as being rather a matter of positioning the company in the network rather than attacking the environment. It is worth noting here that the strategic network is generally used by companies to gain a competitive advantage.

From among the mentioned forms of vertical integration links between economic subjects, capital integration is the least common. It is created when companies from various links of agribusiness form joint units of a manufacturing and trading character, carry out mergers or there are created new companies included in vertical integration[35]. An example of capital integration can be the start of production of food raw materials on the land that belongs to the owner of the processing plant, for example, a slaughterhouse buys agricultural land and conducts raising of slaughter animals there for its own needs[36].

Integration on the basis of the law (legal integration) exists only in some countries. It is usually created by the agency of public-law institutions of the market infrastructure to support the functioning of contract farming. An example of legal integration can be supporting producer groups with subsidies applied in such countries as: France, Spain and Germany.

The most common form is integration based on contracts, which has its cause in the imperfection of the market of food raw materials. Its popularity results from the fact that it is easily acceptable for the farmer[37]. The most important feature of contract vertical integration is that the agricultural producer is associated with the industrial unit only during the validity period of the contract. This

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[33] T.L. Sporleder, *Accessing Vertical Strategic Alliances by Agribusiness*, Canadian Journal of Agricultural Economics 1962, nr 4, quoted after: J. Małysz, *Rozwój agrobiznesu a procesy integracyjne (cz.I.),* "Wieś i Rolnictwo" 2001, nr 4, p. 79.

[34] M. O'Keeffe, *The relationship between Primary Producers and the Processing Sector, A Case in the Australian grain industry,* Seminar on: From Farmer to Consumer, 1991, quoted after: J. Małysz, *Rozwój agrobiznesu…op.cit.,*p. 81.

[35] J. Małysz, *Integracja pionowa a agrobiznes,* „Przemysł Spożywczy" 1996, nr 11, pp. 37-40.

[36] J. Małysz, *Procesy integracyjne w agrobiznesie (ABC integracji)...op.cit.,* p. 8.

[37] *Encyklopedia agrobiznesu…op.cit.,* p. 387.

relation is not permanent – the farmer may withdraw from the contract during its validity if the partner fails to comply with the conditions or there may even take place the unilateral breach of the contract, but then the other party may claim damages[38].

The comparison of selected features of the three forms of vertical integration is shown in Table 1. It can be assumed that the benefits obtained due to contract vertical integration exceed its drawbacks, which may explain its popularity.

Due to the low level of development and organization of agribusiness in Poland it can be assumed that vertical integration in the form of contract farming is the easiest form acceptable for agricultural producers. Other known forms will certainly also be developed over time and better organization of functioning of agribusiness. However, it depends on the profitability of the carried out economic activity and the knowledge and skills possessed by farmers.

Horizontal integration may include not only economic subjects (mergers), but also strictly separate actions, e.g. only sale of foodstuffs or supply of agricultural producers with produce. In this case we are dealing with independent economic subjects which take together certain actions directly related to the production activity. Economic subjects integrating horizontally a selected type of activity, e.g. distribution, benefit through reducing trading costs and showing a greater bargaining power in the market[39]. Small farms may offer only small batches of food raw materials, and thanks to horizontal integration they may even get a similar bargaining power as a network of retail stores.

Horizontal integration limited to distribution does not change the property relations. Such changes may, however, be the case when a certain group of companies decides to jointly invest, e.g. they purchase certain machinery, equipment, etc. Then the acquired assets are not individual but joint property. An example of joint assets is, increasingly common, collective investing by members of producer groups in the purchase of agricultural machinery, construction of storages, etc.

Horizontal integration may also occur in the production phase. Examples are companies dealing with processing (of milk, fruits and vegetables, etc.), which decided to "connect". The merger may result in creation of a large processing plant that will be able to better meet the market requirements. Common connection and operation of several small businesses increases the ability to undertake competition, not only with national subjects, but also with foreign companies.

The subject of considerations presented below are basic forms of integration links as an expression of both vertical as well as horizontal integrations. In particular, the analysis includes such forms as: contract farming, producer groups,

[38] J. Małysz, *Procesy integracyjne w agrobiznesie (ABC integracji)...op.cit.,* p. 9.

[39] F. Kapusta, *Teoria agrobiznesu,* cz. 1, Wyd. AE we Wrocławiu, Wrocław 1998, pp. 246-253.

Table 1

Comparison of selected features of three forms of vertical integration

Selected features	Strategic relation within vertical integration	Contract vertical integration	Vertical integration by acquisition of title
Partners to the arrangement retain formal identity	yes	yes	no, only one company retains identity
The essence of expenditures, transfer of shares	usually the company bears the expenditures which make it a „hostage", each company is a shareholder	not applicable, the arrangement in which the parties have no shares, each company is a shareholder according to the effects of the arrangement	always current dollar investments, one of the companies is a partner and shareholder
Owning shares in relation to cooperation	may exist, but is not a key feature	no	key feature
The essence of control and (or) infringement and relative vertical control over the subject of cooperation	based on trust, the exit from the arrangement relatively simple, minimal, relative control, vague rights and obligations for both partners, maximum flexibility	it is assumed that partners behave opportunistically, special obligations, *in natura* the control is applied in advance, referring to the law in the event of breach of the contract, violation expensive	management replaces contractual control and legal sanctions, maximum relative control
Measurable results and the expected duration	are probable, but may be limited only to "learning" and (or) exchange of technology or silent information, usually long term expected	yes, usually specified in the contract, usually a short-term arrangement	yes, usually as profit or investments, usually long term
Relative costs of „exit"	Low	depend on time; from relatively moderate to high just before the expiration of the contract	high, mistakes cost dearly
Expected synergy effects of investments	yes	no	yes

Source: T.L. Sporleder, *Strategic Alliances as a Tactic for Enhancing Vertical Coordination in Agricultural Marketing Channels,* Forthcoming in Proceedings of the International Agribusiness Management Association*,* San Francisco, C.A. May 1993, quoted after: J. Małysz, *Rozwój agrobiznesu a procesy integracyjne (cz.I.),* "Wieś i Rolnictwo" 2001, nr 4, p. 80.

co-operatives, commodity exchanges, wholesale markets and agro-industrial clusters. They are mainly a manifestation of contractual vertical integration, as well as horizontal integration of agricultural producers. This choice is justified by the popularity of these forms of integration and numerous benefits for both parties to contract deliveries agreement.

1.5. A review of selected forms of vertical and horizontal integrations

Market conditions create a variety of opportunities for sale of agricultural produce. This causes many dilemmas, among other things, hesitation in the agricultural producer – what form of integration to choose, whether to enter or not to enter into a cooperation agreement, and if so, under what conditions. To synthesize the differences between previously described forms of vertical and horizontal integrations, in this subsection in Table 2 there are summarized both the features which favour as well as those which limit the development of various forms of integration.

The development of market economy causes the agricultural producer to be unable to properly read the intricacies of the market game, which makes it difficult for him to locate the products in the optimal market. This problem can be moderated by vertical integration both in the form of contracting, as well as the one created on the basis of the producer group cooperating with the processing company. The hitherto-existing history of functioning of various forms of integration links shows that the majority of agricultural producers are willing to give up their organizational independence, while maintaining economic and legal autonomy. Therefore, in practice the most popular form of integration relations is contracting. It also results from the fact that this form does not require changes in property relations and is easily acceptable for farmers. The development of this form of integration also results from the imperfection of the market of food raw materials and products, as well as from being supported by public and legal institutions shaping the market infrastructure. The development of contract integration is encouraged by the growing risk of production, increased capital productivity and labour efficiency, price fluctuations and competition, and legal regulations regarding integration links. The development of this type of integration may be limited by the possibility of sale within the demonopolized environment, the need for standardization of products, large consumer maturity of agricultural product and deep interventionism in the agricultural market[40].

[40] G.L. Cramer, C.W. Jensen, *Agricultural Economics and Agribusiness,* J. Wiley & Sons, Inc, New York 1991, pp. 24-48.

Table 2

The characteristic features of selected forms of vertical and horizontal integrations

Features / Forms	Favouring	Limiting
1	2	3
Contract farming	– warranty of sale of agricultural produce and products, – reduction of price fluctuations, – lower natural production risk for the farmer, – opportunity to obtain higher prices, – reduction of the costs of searching the market information, – opportunity to use expert advice offered, – increase of efficiency and productivity, – improvement of planning the farm development, – retaining economic and legal autonomy by the farmer, – competitive advantage in relation to other farms, – organization of the supply of agricultural raw materials and products, – creation and strengthening of vertical integration relations, – extension of the agreement period affects the planning of the structure of production and specialization, and processing companies can build optimal raw material bases.	– the loss of organizational autonomy by the farmer, – the risk of becoming dependent on the market partner, – guaranteed market before making the decision to enter into the contract (the sale in the open market would provide sometimes higher prices), – good relations with other market partners are jeopardized, – the size of the farm is often not very attractive to the integrator, – sometimes partners are not interested in signing contracts (agreements), – occurring violations of the contract provisions at the expense of the producer (the contracting entity is by far the stronger party in the contract than the small producer).
Producer groups	– the ability to obtain higher prices in the market and paying lower prices for means of production through the increased bargaining power in the market, – easier access to market and research information, – better access to external sources of financing (credits, guarantees, advances), – the possibility of joint investments in equipment supporting distribution and for pre-processing of the raw material, – eliminating mutual competition and replacing it with cooperation.	– the producers organized in the producer group are not exempt from income tax, despite the fact that this activity is an extension of the farm (which may discourage even the interested), – farmers are perceived as particularly independent and reluctant to cooperate for the sake of mutual benefit, – organized markets, which most often make the purchase from the producer marketing groups, are just starting their activity, – farmers have too little financial capacity to meet the requirements of membership in producer groups, financial engagement and contribution of goods.

1	2	3
Cooperative activity	– the cooperative movement is a social movement because its ideas, organization and method of operation are social, – the cooperative movement is an economic movement since it serves to satisfy economic needs and directly to carry out economic activity, – it counteracts the negative effects of market economy, – defends the interests of its members, – limits the role of intermediaries capturing the incomes of farmers, – moderates monopolistic tendencies, – satisfies widely understood needs of members, – integrates scattered financial resources of the rural population, – participates in the creation of local market, – uses local produce and local labour resources, – defence of interests of economically weak entities unable to cope with the requirements of the market, – it democratizes the social relations in the countryside.	– activities of the majority of cooperatives in the local market which face many difficulties in the highly competitive market – weak popularization of cooperative ideas and emerging views negating this form of farming contribute to the disappearance of this form of activity
Commodity exchanges and wholesale markets	– they contribute to the improvement of business conditions in the market, especially as complex one as the agri-food market, – characteristics of the exchange cause that it sometimes functions on the principles of perfect market, because the process of pricing and making transactions is carried out regardless of personal or subject matter oriented preferences of the participants of trading sessions, – the activity of wholesale markets causes an increase in sales of agriculture and food commodities, which contributes to an increase in incomes of producers, – wholesale markets guarantee lower costs, higher efficiency, greater security for traders, consignees and customers, shorten distribution channels and turnover time, protect the natural environment and customers, and provide greater ability to compete with networks of foreign shops – wholesale markets form logistic centres whose task is facilitation of commodity turnover.	– making exchange transactions does not require showing their subject “in natura” and it is not necessary for all relevant buyers and sellers to be present, which can sometimes incline to certain abuses.

1	2	3
Clusters	– entities integrated in a cluster achieve better economic results through cooperation than by acting separately, – joint operations allow achieving higher competitiveness, – they allow obtaining higher productivity, operational efficiency through the access to specialized and cheaper resources, qualified workers, current market information and business environment institutions, – enhance the ability of companies to innovate by the improvement of the flow of information, knowledge and skills – their activity is conducive to entrepreneurship, reducing the barriers to entering the market, – they enable faster development of infrastructure, sometimes created specifically for their needs, – bring a number of benefits to companies organized in clusters, to research institutions and universities, as well as to close and further surroundings.	– the company entering into the cluster structure loses its organizational autonomy, – cooperation of companies at the appropriate level requires strong commitment and investments in knowledge, managers, qualified workers, – the efficiency of functioning of the cluster requires constant pursuit of development, conducting analytical research and implementing innovations, – willingness to cooperate requires trust in relation to other entities in the industry (perceived as competitors), but also to public authorities that at a certain stage of development of the initiative to create the cluster should become an active party, – the lack of formal and legal regulations discourages potential entities to undertake similar initiatives.

Source*:* The author's elaboration.

Much less popular form of integration of farmers, mainly due to the previously mentioned its negative qualities, is the producer group. The marketing group being its advanced form causes it to become the vertical integrator and create grassroots integration chain, which should encourage agricultural producers to participate. This type of vertical integration chain, created on the basis of the marketing group, is in fact considered to be more beneficial for farmers than vertical integration where the role of integrator usually is performed by a non-agricultural company.

Possibilities to overcome barriers to the development of cooperatives as one of the forms of integration of agricultural producers can be seen in the process of consolidation of cooperatives, and mainly into commercial companies. For example, in the dairy industry it may allow maintaining the cooperative as the cooperative of milk producers that supply the dairy company with the raw material. At the same time, small processing companies may specialize in production of a limited range of products on a large scale. This trend of restructuring leads to modernization of processing lines, and breaking the quality barrier of raw material may take place only at the level of cooperation with farmers[41].

[41] A. Ostromęcki, *Czynniki ...op.cit.*, p. 51.

Analyzing the trends of changes and the tendencies in the European Union (EU) it should be stressed that almost in each member state there function different organizations, although there are certain common characteristics and forms among which can be distinguished:[42]

— trade organizations of producers (trade unions),
— general agricultural organizations (national, religious, regional, etc.),
— chambers of agriculture,
— agricultural organizations of the type of trade unions.

It can be believed that now there make up the basic processes of consolidation of these organizations (interpenetration, development of coordination relations) and formation of organizations in the "technological sequences" (of producers, processors, traders – of cereals, for example), and thus there are progressing vertical and horizontal integrations. In most cases, the above relations show strength and durability, primarily in major industries for a given country. In practice, the relations co-create and co-realize the principles of the Common Agricultural Policy (CAP) for a given sector of production and the agricultural market[43].

The analysis of selected forms of vertical and horizontal integrations in the food economy leads to the conclusion that it is necessary to support these forms by the state policy. The development of this sector is associated by the EU member states authorities with the improvement of its competitiveness. The public sector is therefore involved in the widely understood domestic and foreign promotion of agri-food products. The assistance directed to the production cooperatives, supply and sales, producer and marketing groups, cluster structures, commodity exchanges and wholesale markets in order to improve the efficiency of the production and turnover of food products are the basic conditions for the construction of balance in the food chain. The support for these entities and the relevant legislation promoting production under contracts or cluster structures are the manifestation of efforts of the authorities to stabilize food markets by adjusting their production to the requirements set by these markets.

[42] A. Czyżewski, A. Henisz-Matuszczak, *Rolnictwo Unii Europejskiej i Polski. Studium porównawcze struktur wytwórczych i regulatorów rynków rolnych,* Wyd. AE w Poznaniu, Poznań 2004, p. 63.

[43] A. Czyżewski, A. Henisz-Matuszczak, *Rolnictwo ...op.cit.*, p. 64.

CHAPTER II

OVERVIEW OF CONCEPTS OF INNOVATIVE INTEGRATION LINKS

2.1. The outline of ideas and the genesis of concepts of cluster structures

This part of the study, in reference to determinants of the development of innovative integration relations, is a brief review of definitions and concepts of cluster structures, characterization of their legal forms, advantages of their functioning and limitations and risks resulting from the activity of clusters.

The essence of each national economy is the spatial differentiation of effects of management occurring within its borders. Understanding and explaining the processes determining the occurrence of spatial diversity, and also conditioning the degree of its intensity, is one of the trends in economic geography. During the last two decades there hase been observed a considerable increase in the interest in the phenomenon of spatial concentration of economic activity and the resulting effects. These studies are a part of the trend of the so-called new economic geography (NEG)[44].

Initially in the achievements of economic sciences there was ommitted the spatial dimension of phenomena occurring in economics and, consequently, economy was considered in terms in which it adopted a one-point nature. Only through the works of economists dealing with the problem of land rent or international trade the location has become the subject of study by a wider group of scientists. Thus, thanks to G. Becattini who referred to Marshall[45] industrial districts, there was born the concept of agglomeration as a social environment being a strong and dynamic form of organization, where physical proximity and cultural relations allow using the advantage of proximity in order to achieve benefits, which allows small businesses to share certain expenses and the mutual positive reinforcement[46].

The agglomeration phenomenon is connected with the occurrence of various types of effects associated with it (*economies of agglomeration*). The effects of

[44] S. Figiel, D. Kuberska, J. Kufel, *Analiza uwarunkowań i stanu rozwoju klastrów rolno-żywnościowych w Polsce*, IERiGŻ, PIB, Warszawa 2011, p. 8.

[45] Cf. A. Marshall, *Principles of Economics*, Macmillan, London 1920.

[46] Cf. J. Figuła, *Dystrykty przemysłowe. Małe i średnie firmy włoskie w dobie globalizacji*, Dolnośląska Wyższa Szkoła Przedsiębiorczości i Techniki w Polkowicach, Polkowice 2008.

agglomeration are classified to the group of external economies of scale. They are connected with the benefits that are the share of companies or urban centres, occurring due to the spatial proximity[47]. The benefits which are a result of the agglomeration have been studied by the Swedish economist B. Ohlin who classified the following to their sources:[48]

- internal benefits of scale that are connected with the technique of production;
- localization benefits as a manifestation of impact of the industry on individual entities;
- urbanization benefits being a manifestation of functioning of the economy as a whole and of external nature with respect to enterprises and industries;
- connections occurring between industries.

The differentiation of four types of agglomeration, namely the cities, industrial districts, creative regions and clusters, presented in Table 3, is based on the delimitation carried out in two dimensions. The first concerns the degree of technological connection of activities (diversification of activities within the analyzed agglomeration, compared to agglomeration of activities connected technologically). The second concerns separation of agglomerations characterized by the effects in terms of efficiency (largely by effects of scale) and agglomerations in which there occur innovative advantages[49].

Table 3

Four types of agglomeration

Effects of activity	Characteristics of activity	
	Diversification of activity	Activity technologically connected
Efficiency and elasticity	CITIES	INDUSTRIAL DISTRICTS
Innovations	CREATIVE REGIONS	CLUSTERS

Source: A. Malmberg, Ö. Sölvell, I. Zander, *Spatial Clustering, Local Accumulation of Knowledge and Firm Competitiveness*, "Geografiska Annaler B", Vol. 78, No. 2, 1996, pp. 85-97; quoted after: S. Figiel, D. Kuberska, J. Kufel, *Analiza uwarunkowań... op. cit.,* p. 11.

The first type of agglomeration – cities – is connected with the occurrence of the advantages available to all companies and industries resulting, among other things, from lower costs of transport. Under favourable conditions, the effects of urbanization may lead to the development of metropolitan areas or functional regions, characterized by an increased intensity of industrial activity[50]. Industrial districts, being the second one of the types of agglomerations covered by the effects of urbanization,

[47] Cf. M.J. Healey, B.W. Ilbery, *Location and Change: Perspectives on Economic Geography*, Oxford University Press, Oxford 1990.

[48] *Klastry biznesowe w rozwoju konkurencyjności i innowacyjności regionów. Świat-Europa-Polska*, E. Skawińska, R.I. Zalewski (ed.), PWE, Warszawa 2009.

[49] Ö. Sölvell, *Clusters – Balancing Evolutionary and Constructive Forces*, Ivory Tower, Sztokholm 2009.

[50] An example of the region of industrial profile is American Rust Belt.

include companies based around a similar profile of activity or related activity. These agglomerations are characterized by flexible productive systems. In both cases, there comes an increased efficiency and flexibility of activity. Creative regions and clusters are an example of agglomerations within which there follows the creation of knowledge and occur innovation processes. In the case of clusters, an important role in their functioning is played by the processes related to the exchange of information and the flow of *know-how*. Examples of agglomerations are also the creative regions within which these processes play a key role. In their case, however, there does not comes limiting only to the analysis of technologically related activity, because the emphasis is put on the analysis in general dimension, not selective[51].

The attempts to define what a cluster is were and are still undertaken by many authors. Due to its interdisciplinary nature the theory of clusters as specific forms of agglomerations gains importance due to the interest from researchers representing different disciplines.

The word 'cluster'[52] was first used and defined in 1990 by M.E. Porter. According to the definition by this author the cluster is a *"geographic concentration of interconnected companies, specialized suppliers, service providers, companies operating in related sectors and institutions connected with them (for example, universities, standardization bodies and industry associations) in particular fields, competing with each other but also cooperating. Clusters reaching a critical mass (necessary number of companies and other institutions creating the effect of agglomeration) refer remarkable competition successes in certain fields of activity, mainly in economically developed countries"*[53].

In the literature on the subject, beside the definition presented above there function many other terms for the cluster (e.g. group, industrial bunch, cooperation network). Most of them point to three key distinguishing features of the cluster:

— concentration on a specific area, of cooperating and interdependent companies operating in the same or related sectors of industry or services;
— interactions and functional relations between companies;
— trans-sector dimension of the cluster covering with its range both horizontal as well as vertical integration relations.

In addition, some authors indicate social and cultural factors which are of essential importance for the effective transfer of information in the cluster[54]. There

[51] Ö. Sölvell, *Clusters... op.cit.*

[52] The word *cluster* means a group of similar things growing or occurring together, a group of people or things existing close to one another.

[53] Cf. M.E. Porter, *Porter o konkurencji*, PWE, Warszawa 2001.

[54] Cf. D. Jacobs, A.P. De Man, *Cluster, industrial policy and firm strategy: a menu approach*, Technology Analysis and Strategic Management 1996, 8(4); S.A. Rosenfeld, *Bringing Business Clusters into the Mainstream of Economic Development*, Euorpean Planning Studes 1997, 5(1); A.L. Saxenian, *Regional advantage: culture and competition in Silicon Valley and Route 128*, Harvard University Press, Massachusetts 1994.

are also emphasized the functions of other indicators determining the structure of the cluster, namely: type of innovations, form and intensity of integration relations, transfer of knowledge and production technology, short geographical distance, characteristic infrastructure, resources of highly skilled workers or a wide network of services complementing the effectiveness of the above actions[55].

In the Polish economic literature there are indicated a few main reasons conditioning the better competitiveness of companies functioning within the cluster, i.e. an increase in the importance of local development level, a significant increase in the importance of work in network systems and an increase in the importance of human capital associated with rapid technological progress[56].

Clusters in the formulation of the idea as T. Markowski puts it are a specific form of spatial organization of industry and service sectors considered to be the most mature form of organization of production from the point of view of the ability to maintain development[57]. Their special feature is the ability to generate and sustain competitive advantage[58]. M.J. Enright on the basis of the detailed analysis of 160 clusters from around the world showed that nearly 70% of them have a strong or very strong competitive position, while about 60% of the analyzed clusters are characterized by high innovation[59].

Clusters as specific structures of relations may arise in virtually every sector of economy – both in industry and services, in sectors of advanced technology as well as in sectors of traditional technology. They can be distinguished by varied

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[55] T. Brodzicki, S. Szultka, *Koncepcja klastrów a konkurencyjność przedsiębiorstw*, „Organizacja i Kierowanie", Warszawa 2002, nr 4 (110), p. 2.

[56] Cf. R. Domański, *Przestrzenna transformacja gospodarki*, PWN, Warszawa 1997; J. Hausner, *Postfordowski paradygmat przemysłowy*, Gospodarka Narodowa 1994, nr 4; J. Kamycki, *Klastry – nowe powiązania w branży rolno-spożywczej,* Biuletyn informacyjno-handlowy, Wyd. PODR w Boguchwale, Boguchwała 2007, nr 4, pp. 25-26; W. Maik, *Nowe ujęcia kwestii lokalnej w teorii społecznej i praktyce planistycznej* [in:] W. Kosiedowski (ed.), *Gospodarka przestrzenna i regionalna w trakcie przemian*, Uniwersytet Mikołaja Kopernika, Toruń 1995; M. Matlegiewicz, *Klastry jako czynnik aktywizujący rynek lokalny na obszarach* wiejskich [in:] L. Pałasz (ed.), *Potencjał rozwojowy obszarów wiejskich w aspekcie wstąpienia Polski do Unii Europejskiej. Tworzenie i poprawa struktury agrarnej gospodarstw rodzinnych*, Tom 2, AR w Szczecinie, Wyższa Szkoła Społeczno-Ekonomiczna w Ostrołęce, Szczecin 2006, pp. 415-422; I. Pietrzyk, *Koncepcja terytorialnych systemów produkcyjnych w ekonomii zachodniej. Wnioski dla Polski* [in:] H. Ćwikliński, G. Szczodrowski (ed.), *Dylematy i osiągnięcia polskiej polityki transformacji gospodarczej*, UG, Gdańsk 1995; A. Zielińska-Głębocka, *Konkurencyjność przemysłowa Polski w procesie integracji z Unią Europejską*, Fundacja Rozwoju Uniwersytetu Gdańskiego, Gdańsk 2001.

[57] Cf. T. Markowski, *Zarządzanie rozwojem miast*, PWN, Warszawa 1999.

[58] Cf. M.E. Porter, *The Competitive Advantage of Nations*, Free Press, Nowy Jork 1990; J. Meyer-Stamer, *Strategien lokaler/regionaler Entwicklung: Cluster, Standortpolitik und systemische Wettbewerbsfähigkeit*, Institut für Entwicklung und Frieden, Universität Duisburg, Duisburg 1999.

[59] Cf. M.J. Enright, *Regional Clusters: What we know and what should we know*, Paper prepared for the Kiel Institute International Workshop on Innovation Clusters and Interregional Competition, Kilonia 12-13 November 2001.

levels of innovation and technological progress and at the same time they can use different strategies and differently shape the prospects of their own development.

M. E. Porter has collected information concerning over 700 different cluster structures identified in many countries around the world. Thorough analyses of individual clusters showed that they are distinguished by higher competitiveness and innovation. Examples of effectively functioning widely known clusters of high technology include: Silicon Valley (semiconductors and information technologies), Lombardy (ICT industry and chemical industry), Cambridge (biotechnology, computer and information technology industry), Austin, Montpellier (telecommunications, software, biotechnology). In contrast, L. Mytelka and F. Farinelli give examples of clusters operating in low-tech sectors and simultaneously distinguished by a high level of innovation – such us the eyeglass frames and wool processing industry cluster in Italy or the furniture cluster in Denmark[60].

The identification of cluster structures is based on the isolation of a series of market connections of those relations that are associated with the functioning of the value chain in the vertical and horizontal dimensions. The established relations bring together the entities which represent different links of this chain. Thus, the following groups of entities may function within clusters:[61]

- companies (competitors, suppliers, service providers, purchasers and companies in related sectors);
- representatives of the public sector (central level, regional level and local communities);
- representatives of the academic community (universities, research institutes, technology parks, technology transfer centres, etc.);
- organizations supporting cooperation (chambers of commerce, cluster organizations, etc.);
- financial institutions (financing resources);
- the media (creators of the cluster's and region's brands).

An important issue in the functioning of cluster structures is the knowledge of the concept of coopetition[62]. The essence of coopetition is expressed by the fact that companies seek to gain a competitive advantage through specific resources, competencies and specific market position, while trying to integrate their strengths with the advantages of competitors, suppliers, customers and other business partners. Coopetition, on the one hand, is the joint exploitation of their own competitive potentials by coopetiting companies, and, on the other hand, continuous fierce competitive struggle through cost leadership or differentiation of shares in the

[60] Cf. L. Mytelka, F. Farinelli, *Local clusters, innovation systems and sustained competitiveness,* Paper prepared for the meeting on Local Productive Clusters and Innovation Systems in Brazil: new industrial and technological policies for their development, The United Nations University, Institute for New Technologies, Rio de Janeiro 2000.

[61] Ö. Sölvell, *Clusters... op.cit.*

[62] Coopetition is a combination of cooperation and competition.

market and boosting technological changes in the industry. It is worth emphasizing that the exploitation of this type of relations is an immense challenge[63].

The companies which want to benefit from the fact that they are included in coopetition must recognize the importance of both competition and cooperation. In coopetition relations it is particularly important to create conditions conducive to honest cooperation and competition, and an extremely valuable skill is to manage the trust in business partners. A key challenge is to develop such management skills which will allow combining these opposing strategic attitudes and protecting business secrets of any company.

2.2. Clusters and cluster initiatives – comparative aspects

In recent years the issue of cluster structures has met, as mentioned earlier, with a wide interest of economic policy makers. This is reflected in the creation of the policy supporting the development based on clusters (*cluster-based policy* or *cluster-oriented policy*) whose essential elements or even complete solutions have been introduced by most member of OECD **(***Organization for Economic Co-operation and Development*)[64]. One of the most visible signs of this interest is the creation and formation of cluster initiatives and clusters.

In the literature on the subject there is a significant difference between the clusters as processes occurring in the economy and the cluster initiatives. In practice, especially in Poland, the terms 'cluster' and 'cluster initiative' are often used interchangeably to mean an actual initiative or even a cluster organization. Therefore, an important issue at this point is to distinguish the cluster from the cluster initiative which is more or less institutionalized group of local actors seeking to initiate functioning of a given cluster or to solve important problems of the already functioning cluster[65]. The intention of the cluster initiative is to accelerate the process of formation of the cluster or its reinforcement. According to the author of this study, the cluster initiative may be a dynamic stimulus to the development of the cluster as well as the expansion of the whole region.

According to Ö. Sölvell et al., the cluster initiative is defined as an organized activity aiming at the promotion of the development and strengthening of competitiveness of clusters which include companies belonging to the cluster separated in the region, the entities representing the authorities and/ or the representatives of research units[66]. The above-presented variation in the composition of cluster initia-

[63] B. Jankowska, *Koopetycja w klastrach kreatywnych. Przyczynek do teorii regulacji w gospodarce rynkowej*, Wyd. UE w Poznaniu, Poznań 2012, p. 58.

[64] Cf. T. Brodzicki, S. Szultka, *Koncepcja klastrów... op.cit.*

[65] *Inicjatywy klastrowe*: http://www.rsi.podkarpackie.pl/Strony/inicjatywy-klastrowe.aspx (access on 16.02.2015).

[66] Cf. Ö. Sölvell, G. Lindqvist, C. Ketels, *The Cluster Initiative Green-book*, Center for Strategy and Competitiveness, Sztokholm 2003.

tives is consistent with the classic Porter's definition of a cluster in which there were also separated the components of various types. However, according to Skawińska and Zalewski, a cluster initiative is "*a collective activity of groups of companies, public sector entities and other related institutions in order to improve the competitiveness of economically active entities in a given geographic region*"[67]. According to the above-mentioned authors, cluster initiatives bring about the improvement of operations and strategies in the group of companies, improvement of conditions of the specific business environment and strengthening of networking of enterprises to obtain economic benefits and *spill-overs* (creation of spin-offs).

The support for the expansion of cluster initiatives has become a key element of the economic policy implementing such priorities as development, innovation, cooperation and competitiveness. In addition, the prospect of the benefits from cluster initiatives for companies and regions encourages potential participants to engage in the development of such an initiative. Acting together can bring rationalization of the internal processes in companies and institutions, use of the synergies between partners, common use of the resources and infrastructure, minimization of the risk of taken actions and, first of all, generation of additional profits by changing the approach to competitors. The potential benefits from cluster initiatives also include:[68]

- increase in specialization allowing each of the entities to focus on its key competencies;
- acquiring and adding complementary competences by acquiring new knowledge and experience or ordering a task to a competent partner;
- extention of the scope of offerred products and the ability to offer a full system of solutions and processes;
- better use of available resources and production capacities;
- dynamic building of a *know-how* database;
- improvement of the access to information and reduction of uncertainty (exchange of experience);
- use of the support for participants (services and practical solutions) usually organized by the initiative;
- increase of revenues through new sales channels, more accessible information about new markets, reduction of entry barriers;
- full access to the infrastructure created for the needs of the cluster;
- growth of innovation through the increase in cooperation with the research and development sphere.

It is worth emphasizing here that the formation of cluster initiatives takes place independently of the degree of economic development. Both in highly developed economies and in less developed economies there is noted the trend of growth

[67] *Klastry biznesowe... op.cit*., p. 181.

[68] *Inicjatywy klastrowe: skuteczne działanie i strategiczny rozwój*, M. Koszarek (ed.), Wyd. I, PARP, Warszawa 2011, pp. 9-10.

of the presence of the issue of clusters and initiatives accompanying them in the practice of economic life. It is also worth noting that the functioning of cluster initiatives may take place independently of the industrial profile of the cluster supported by them[69].

2.3. Legal forms of creating cluster initiatives and clusters

The selection of organizational form – both the legal form and the structure – is one of the most problematic issues and therefore the most frequently raised one by cluster initiatives to explain and support. At the creation stage, the initiators of initiatives are rarely able to foresee the consequences of their choices in the long run and are usually guided by the most popular schemes of action. It is particularly worth noting that in the Polish legal system there is no one model legal form of cooperation dedicated for partners in a cluster structure, but there are available patterns that may be used to create a cluster initiative. In fact, there are the patterns of legal forms, prescribed by the law, in which there is established cooperation aiming at achieving specific objectives (economic, *non-profit* or *not-for-profit*) or reflecting the nature of the partners' activity (union, purely business or social)[70].

An important aspect in creating the form of the cluster organization is its final purpose (type of activity). In this regard, extremely important is the specificity of the environment (region and its conditionings) in which the cluster initiative is created. It determines, in the first place, the advantage of a given type of partners in terms of the number or importance (administration, business or scientific partners), and in the longer term the strategy which a given cluster chooses and the financing sources for its realization. In an environment where administrative partners in the form of local and regional authorities gain an advantage, both strategic objectives and current activities and sources of their financing will look quite different than in a cluster in which an advantage is gained by entrepreneurs operating fully on the market rules, i.e. profitability of an undertaking. The above phenomena determine the model of cooperation of partners in the cluster, and perforce also the organizational and legal form of cooperation together with the rules of cooperation. Among the basic legal forms of cooperation dedicated to cluster initiatives there should be mentioned: association, foundation, chamber of commerce, commercial company (personal company and capital company), various types of partnership (e.g. consortium, joint venture), civil partnership[71]. Table 4 presents the pros and cons of each of the legal forms and the sources of financing.

[69] S. Figiel, D. Kuberska, J. Kufel, *Analiza uwarunkowań... op.cit.,* p. 29.

[70] I. Sokołowska-Kulas, M. Koszarek, *Forma organizacyjna i struktura inicjatywy – czy istnieją optymalne?* [in:] M. Koszarek (ed.), *Inicjatywy klastrowe... op.cit*., pp. 93-94.

[71] *Ibidem*.

Table 4

The characterization of available legal forms at creation of cluster organizations

Legal form	Pros	Cons	Financing
1	2	3	4
Association	– a convenient form for the operator or coordinator of cooperating partners, – may conduct economic activity (within realization of the statutory purposes), – takes advantage of tax privilleges, – is a legal person and has the internal structure regulated by the law, – represents the cluster outside, – is a legal form generally accepted to be a beneficiary (within the EU assistance programs).	– provides for different categories of members, which makes the most important initiatives of cooperation of partners in the cluster remain outside the structure, – association supports mainly its own members and discriminates the supporting members, – membership fees expended for the benefit of association are not deductible costs for the members, – difficult management in a changing group of members.	– membership fees, – statutory activity, – public funds.
Foundation	– is a legal person for the cluster initiative, – coordinates the cooperation of participants at the appropriate level, – represents the cluster outside, – the possibility of any "surrounding" of the foundation as coordinator of cooperation, – can take advantage of many tax privilleges, – no need to pay contributions by the participants for the activity of the cluster.	– the coordinating body (foundation) is in the foreground, not partners, – in the absence of internal rules showing the hierarchy of dependence there lacks clarity about who de facto is represented by the foundation, – Establishing the foundation itself requires additional legal regulations formulating its relations with the actual participants of the cluster structure.	– by founders (foundation property) and members in the form of premiums, – statutory activity (not-for-profit economic activity), – public funds.
Chamber of commerce	– the assets of the chamber and organizational unit are formed from membership fees, donations, legacies, bequests, own activity, income from assets of entities, – they may conduct economic activity on general rules, – the income is used to carry out statutory tasks and can be shared among members.	– it can be created, if such a decision is taken by at least 50 entrepreneurs (founders), – if the scope of activity goes beyond the province, at least 100 entrepreneurs is needed to establish it.	– membership fees, donations, legacies, bequests, own activity, income from assets of entities.

1	2	3	4
Commercial company	– transparent and popular organizational structure for cluster tasks, – Cluster is a legal person, the coordinator in the form of company, – the company represents the cluster outside, – a limited liability company takes over the main burden of the activities for the benefit of cluster participants (takes remuneration for that), – a limited liability company is mostly self-financing.	– Diversity of categories of participants in the cluster undermines transparency of cooperation and introduces distrust, – hindered entry and exit procedures for partners, – there is a risk of promoting the company at the expense of participants and the negative consequences of corporate connections, – the risk of allegation of existence of practices violating fair competition, – small contribution and benefits from cooperation in relation to the public partner.	– contributions of owners, – economic activity, – external financing (credits, leasing, bonds, public and private funds).
Partnering cooperation of companies	– the maximum focus on a specific undertaking bringing profits directly to partners in the cluster, – convenient form of cooperation in relation to the nature and specificity of a particular undertaking, – open formula of cooperation (lack of joint responsibility, lack of common assets).	– lack of separate legal formula (legal personality) enabling taking commitments and undertaking, – the need to develop common rules of cooperation (regulations, codes of good practice) forming the quality of cooperation.	– each time by a group of entities interested in the realization of a given project, – public funds.
Civil Partnership	– based on cooperation of entities (natural or legal persons) pursuing a common goal, – all partners are jointly and severally liable for the obligations.	– lack of legal personality, – the assets of partners may not be distributed during the existence of the company, – a creditor may demand satisfaction from all partners together or from each partner separately.	– cash or non-cash contributions of partners, – economic activity, – external financing (credits, leasing, public funds).

Source: The author's elaboration on the basis of: P. Fabrowska, M. Halicki, D. Kozdęba, P. Piotrowska, A. Szerenos, *ABC Jak założyć klaster? Przewodnik dla przedsiębiorcy*, Urząd Marszałkowski Województwa Dolnośląskiego, Wrocław 2009, pp. 27-28; I. Sokołowska-Kulas, M. Koszarek, *Forma organizacyjna... op. cit*., pp. 94-110.

The experience of functioning cluster structures shows that one of the optimal solutions is the form of association. It enables a comprehensive approach to

the issues of cluster initiatives, and in practice it leads to a situation in which the association itself becomes a cluster. The basic legal act regulating the legal form which is an association is the Act of 7 April 1989 – Law on Associations (Dz. U. z 1989 r. Nr 20, poz. 104). Already at the stage of creating a relation, the association reveals its advantages. Its members, by creating the statute, determine the final objectives and rules of cooperation in the cluster. It is worth adding that, in accordance with Art. 17 of the Act, registration of an association in the National Court Register is free from court fees[72].

It should also be noted that, on the one hand, the statutory limitations on the activity of ordinary associations are far-reaching – especially the lack of legal persons among the full members of the association – which is the reason why this form is used by associations of local reach and serving satisfaction of the personal needs of their members, without aspiration to realize broader social interests. However, on the other hand, associations in their activity are close to the public sphere, therefore it refers to cooperation within the triple helix[73] of partners in the cluster. The association may actually benefit from public subsidies, has the right to speak out on public issues. The association also reaches transnational cooperation as it may belong to international organizations under the terms and conditions specified in their statutes[74].

It is worth emphasizing here that the above-mentioned forms do not exhaust all the possible organizational forms in which a cluster initiative or cluster may function. Particularly noteworthy are also mixed forms created by combining classical forms of cooperation (e.g. loose cooperation and cluster administrator). The manner of combining should, however, reflect the characteristics of the environment in which the cluster initiative is established and the specificity of the entities forming this structure[75].

2.4. The benefits and advantages of functioning of innovative structures

The concept of cooperation based on the cluster model is becoming more and more popular and gives a single enterprise more power to act in the market. The main area of activity of the enterprise, which is significantly affected by its membership in a cluster, is innovation. Cluster structures create and enable the use of

[72] P. Fabrowska, M. Halicki, D. Kozdęba, P. Piotrowska, A. Szerenos, *ABC Jak założyć... op. cit*., pp. 29-30.

[73] Triple helix, also a golden triangle, the concept meaning participation within cluster initiative or other organization, e.g. regional system of innovation, three groups of partners: sphere of companies, spheres of scientific-research and educational character and administrative sphere (e.g. local governmental).

[74] I. Sokołowska-Kulas, M. Koszarek, *Forma organizacyjna... op. cit.*, pp. 95-96.

[75] *Ibidem*.

pro-growth conditions for running activity[76]. Innovation in clusters is supported by greater ease of reaching potential sources of information on innovation, it becomes easier to identify technological trends, the combination of competences accelerates the expansion of enterprises and products. A higher rate of growth results from a better access to seed capital and venture capital, sophisticated risk management tools, a greater strength of a cluster as a whole and a lesser importance of interest groups which could be a barrier to decisions, and also a proven network of access to funding sources and complementary skills. The efficiency of activity results from specialization and competition, as well as from the access to specialized resources[77].

Enterprises in the cluster can use the internal connections and areas common to all of them. Promotion and marketing of products and services, conducting, realization and financing of research and commercial projects, legal and financial advice may be realized within the combined initiatives. It optimizes not only the level of costs, but it brings an increase in the credibility of individual companies towards external business partners. The cluster gives the company a more ideal market image since it is the first guarantor of the quality represented by the company. The fact that it is incorporated into the cluster structure may be the basis for confirming certain standards of activity, production, services, long-term quality, constant development, up-to-date competences. Enterprises in clusters partially take over the image borrowed from their partners. This is one of an important aspect of creating more added value by the cluster as a sum of many enterprises[78].

The cluster structure therefore brings measurable benefits as a form of cooperation between enterprises and the benefits include:[79]

- increased productivity of activity,
- economies of scale,
- reduction of costs of transactions, transportation, technical infrastructure,
- specialization, due to critical mass of entities specializing in a particular field,
- specialization of factors, i.e. labour market, sources of research and development, technology, financing mechanisms,
- access to information on changes of the market and technology,

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[76] M. Kozak, *Klastry – wyzwanie dla rozwoju MŚP w Polsce*, e-mentor nr 1 (28), luty 2009, p. 15.

[77] T. Andersson, et al., *The Cluster Policies Whitebook, International Organization for Knowledge Economy and Enterprise Development (IKED)*, Malmö 2004; quoted after: A. Rundo, *Klastry jako model współpracy przedsiębiorstw* [in:] A. Rundo, M. Ziółkowska (ed.), *Nowoczesne modele współpracy przedsiębiorstw*, CeDeWu, Warszawa 2013, pp. 57-58; *Zarządzanie ryzykiem*, K. Jajuga (ed.), Wyd. Naukowe PWN, Warszawa 2007, pp. 26-32.

[78] A. Rundo, *Klastry jako model... op.cit.*, p. 58.

[79] M. Baran, M. Kłos, *Formy sieciowego współdziałania przedsiębiorstw* [in:] E. Okoń-Horodyńska, A. Zachorowska-Mazurkiewicz (ed.), *Innowacje w rozwoju gospodarki i przedsiębiorstw: siły motoryczne i bariery*, Instytut Wiedzy i Innowacji, Warszawa 2007, p. 316.

— access to skilled labour,
— the ability to more easily adapt and respond to changes in the environment (technological knowledge, practice of management, marketing),
— learning process through joint search of activities and innovative solutions,
— the use of complementary elements and synergies between the companies.

Higher productivity of activity is provided by the local supply chain which guarantees faster access to necessary resources, while the costs to reach them are also lower. Similar situation is with the access to the labour skilled enough for the needs of the cluster structure. It is also more easily available, and the size, opportunities and stability of jobs, which the cluster allows, makes the experts themselves eagerly come to this type of competence centres and stimulate their further development. Specialization increases productivity and competition increases quality. The proximity of competing entities imposes on a single enterprise the need to constantly monitor the market, the behavior of rivals, product modifications, and thus developing flexibility in adapting to changes and the speed of reaction to them[80].

A classical example of the benefit resulting from participation in the cluster structure is the facilitated access to the transfer of technology and innovation, *know-how*, as well as the informal labour market. The proximity of the research centre secures the creation and transfer of expert knowledge, as well as human capital. The cluster organization enables continuous upgrading of qualificationss and development of skills of workforce which is one of the key factors of the cluster's competitiveness. The above actions inevitably lead to better opportunities for achieving a greater degree of innovation. Close cooperation, high level of trust, numerous interactions are an excellent ground for new ideas, create a unique microclimate for innovations which can be both tested and implemented at a lower cost. Companies gain partners and suppliers within the cluster, which is another factor promoting efficiency and better productivity of processes and the cooperation itself[81].

The issue of innovation is crucial for clusters – it determines their international competitiveness. The difference between innovative clusters and traditional local production systems is that in the case of the first ones important are partnership and cooperation not only between companies but also between companies and the world of science and research. Thus, research institutes and universities are important entities in such clusters coming into networks of interactions with the enterprises within a given production system cooperating among themselves. Such clusters are often said to be the local innovation systems. They also play a special role in the national innovation systems, since they make the creation of innovation more dynamic and support the process of their implementation and popularization.

[80] A. Rundo, *Klastry jako model... op.cit*., pp. 58-59.
[81] *Ibidem*.

It is worth emphasizing that the cluster structure is a model where innovations are not an accidental effect of actions aimed at different results, but where intra-organization research units together with companies transform scientists' discoveries into real product or process innovations.

The practical research conducted within the project Innobarometr and the research conducted by various European committees for the development of clusters in all EU countries show specific indicators of positive effects of acting in a cluster, among which should be mentioned:[82]

- enterprises operating in the cluster are more innovative than those which do not operate in clusters,
- economic growth of enterprises is connected with the degree of the cluster's development,
- organizations in the cluster pay attention to the benefits resulting from flow of knowledge and growth of skills,
- 85% of companies operating in clusters believes that the initiative improved their competitiveness,
- companies in clusters register more trademarks (29% vs. 14%) and gain more patents (29% vs. 12%),
- enterprises in clusters outsource more research (41% vs. 20%) and reduce their own (44% vs. 53%),
- enterprises in the cluster expect improvement of support services.

Pointing to the impact of clustering on the environment of enterprises, surroundings and economy, as well as the benefits and costs of such a model of cooperation between companies, there can be identified the areas and effects of interactions of cluster structures:[83]

1. At the macroeconomic level:
   - reduction of the overall costs connected with the functioning of the industry,
   - increasing the competitiveness in the domestic market,
   - attracting foreign investments,
   - activation of export,
   - stimulating innovation at the level of economy,
   - creating the centres stimulating and stabilizing economy,
   - reducing unemployment,
   - reducing social transfers for the unemployed.
2. At the regional level:
   - sensitizing the local authorities to strategic thinking about the region, as well as every element of the local economy,
   - stimulating innovation at the regional level,

[82] L. Knop, *Szanse i bariery rozwoju klastrów technologicznych w Polsce*: http://dlafirmy.info.pl (access on 17.02.2015).

[83] A. Rundo, *Klastry jako model... op.cit*., pp. 60-61.

- familiarizing the local authorities with the concept of creating zones of high specialization in specific fields for the good of the region,
- increase in employment and qualifications of workforce, higher mobility of human capital,
- exploitation and implementation on a wider scale of information technologies, which raises the general level of education and awareness of citizens,
- development of entrepreneurial attitudes and encouraging people to conduct this type of activity,
- strengthening faith in the success of local initiatives and the local patriotism on the basis of the fact that the local collective organization of enterprises managed to succeed,
- significant improvement of communication.

3. At the level of the individual enterprise:
   - distribution of operating costs to a greater number of entities,
   - certainty resulting from establishing a long-term cooperation,
   - the potential to increase sales,
   - access to resources and lower prices,
   - creating innovation at the level of enterprises,
   - expansion and enrichment of the offer,
   - increased flexibility in acting and responding by companies,
   - providing new companies with opportunities for running business with lower risk of bankruptcy at the early stages of development.

2.5. Limitations and risks associated with functioning of clusters

The aforementioned benefits from functioning of cluster structures do not mean that in Poland there are conditions fully conducive to their formation. Unfortunately, there are often found numerous barriers limiting their expansion, and it is the subject of this part of study. However, the main conditionings of the development of cluster structures will be the subject of the next full chapter of the work.

The review of literature, reading of interviews with the coordinators of clusters, as well as the analysis of official documents of the institutions that have influence on functioning of cluster structures (made by W. Wierżyński) allow distinguishing four main types of barriers to development:[84]

- organizational (system) barriers,
- institutional barriers,
- market barriers,
- mental barriers.

[84] W. Wierżyński, *Bariery w rozwoju klastrów*: Portal Innowacji: http://www.pi.gov.pl/Klastry/chapter_95457.asp (access on 20.02.2015).

Organizational barriers relate to the actual shape of the Polish economy and its individual segments, in particular the R&D sector and the system of financing of cluster initiatives. Institutional barriers come down to the relations between the already acting and potential members of clusters and the bodies of local administration, government, business institutions. Market barriers are trends in the global economy, the increase of competitiveness, the issues of economic cycles (the risk of recession and crises)[85]. Finally, mental barriers which can be identified with socio-cultural factors, rooted rules of cooperation, the deficit of social trust in the public sphere. The synthetic approach to each of the mentioned types of barriers is presented in Table 5.

It should be emphasized here that the barriers listed in the table do not make a complete list – with the development of the idea of clustering there will surely emerge further limitations and impediments to the expansion of cluster structures. It does not change the fact that some of the mentioned ones are very dangerous and therefore require special attention.

Table 5

The list of selected barriers to the development of clusters in Poland

System	Institutional	Market	Mental
Weak formal links between the entities of the economic life	Unreformed R&D sector	Limited funds	The dominance of the competition paradigm
Poor cooperation of companies within R & D	Insufficient development of business environment institutions	Low level of innovation in economy	the deficit of social trust in the public sphere
Poor cooperation of entrepreneurs with the R&D sector	Shortcomings of self-governmental and central administrations	Lack of innovation on an international scale	The weakness of (grassroots) public initiatives
Unsatisfactory forms of cooperation in the economic life	Bureaucracy restricting the access to public funds	Low number of obtained patents	Weak foundations of civil society
Deficiencies in the legislative sphere		Dependence on public funds	Misunderstanding of the idea of clustering, selfishness and particularism
			Impatience and shortsightedness of action

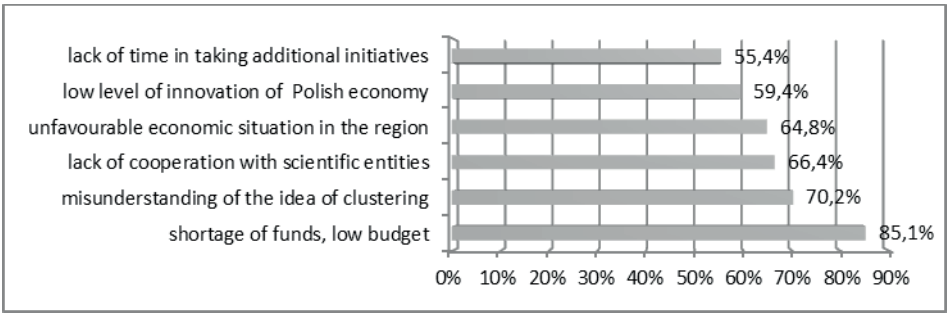
Source: W. Wierżyński, *Bariery w rozwoju klastrów*:
Portal Innowacji: http://www.pi.gov.pl/Klastry/chapter_95457.asp (access on 20.02.2015).

[85] Cf. A. Wojtyna, *Kontrowersje wokół charakteru ożywienia po kryzysie finansowym i recesji* [in:] A. Wojtyna (ed.), *Charakter ożywienia po kryzysie*, PWE, Warszawa 2014, pp. 13-28.

Based on the general opinion of entrepreneurs[86], the most important limitation in the development of clusters (Fig. 1) are financial barriers (85,1% of responses), and misunderstanding of the idea of creating a cluster (70,2% of responses). However, in a similar research in 2008, conducted by J. Hołub-Iwan and M. Małachowska, the lack of funds and insufficient budget as the most serious barrier to the development of clusters was indicated by 89,7% of entrepreneurs[87]. The second most important barrier was misunderstanding of the idea of establishing a cluster initiative (67,9% of affirmative responses). Taking into account the significant funds intended for supporting clusters, for example, under the Action 5.1 of the Innovative Economy Operational Program "Supporting the development of supra-regional clusters" (104 million EUR), there should be modified the subjective assessment of business representatives and it should be stated that the problem is not the shortage of capital but rather the difficulties with how to use the capital.

Fig. 1.

Limitations in the development of cluster structures in the opinion of entrepreneurs



Source: The author's elaboration basis on the pilot surveys.

According to another opinion of experts, in the problems of clusters more important than financial problems are cultural and mental barriers, i.e. weak propensity to cooperate and the mistrust of fellow citizens so much rooted in the Polish society. This is caused partly by the legacy of the centrally planned economy, a relatively short period of development of the private business sector and the domination of a falsely-conceived competition culture which does not see in cooperation the opportunities for joint expansion. It is connected with a low level of trust between business partners, as well as ordinary citizens[88].

[86] The pilot surveys were conducted in 2013 among entrepreneurs associated with Podkarpacki Klaster Rolno-Spożywczy.

[87] J. Hołub-Iwan, M. Małachowska, *Rozwój klastrów w Polsce. Raport z badań*, Szczecińska Fundacja Talent-Promocja-Postęp, Szczecin 2008, p. 47.

[88] A.M. Kowalski, *Znaczenie klastrów dla innowacyjności gospodarki w Polsce*, Oficyna Wydawnicza SGH w Warszawie, Warszawa 2013, pp. 184-185.

Referring to the previously quoted research[89], it is also worth noting that as many as 75% of the respondents (representatives of managing institutions and enterprises) representing the business world recognized that an important barrier to the development of clusters is the lack of partnering and business-oriented cooperation with the scientific environment. As for the results of the author's research, such opinion was shared by 66,4% of the respondents. An important limitation of a structural nature is also a low level of innovation of the Polish economy, which is the result of short-term actions of companies focused primarily on gaining funds which are then used for current activity.

It is worth noting here that apart from the undeniable benefits from functioning of clusters, there are also many risks accompanying cooperation within such structures. To the drawbacks of cluster structures belong in particular:[90]

— too narrow specialization,
— technological isomorphism,
— increasing costs of labour,
— rising costs of land and immovable property,
— increasing diversity of incomes,
— pressure from the environment.

Cluster structures are exposed to strong, harmful processes and phenomena arising both from cooperation and direct competition. It is so because the cluster is often formed by former competitors. An equally significant risk in the functioning of the cluster is the asymmetry of the system. It is expressed by the disproportion of the benefits gained by the participants in relation to their investments, adverse conditions of the division of rights and responsibilities or even harmful effects of these relations for the realization of the cluster's development strategy[91].

Another significant threat to the functioning and expansion of clusters is the fact that in Poland the formal cooperation between companies and the sector of universities and scientific and research entities is not sufficiently developed. Limitations in the possibilities of establishing such cooperation with institutions from the academic and research and development sectors is a weakness of clusters since the enterprises competing in the increasingly globalized market require cooperative relations with the scientific and research sector which can provide them with

[89] J. Hołub-Iwan, M. Małachowska, *Rozwój... op. cit.*, p. 49.

[90] B. Mikołajczyk, A. Kurczewska, J. Fila, *Klastry na świecie. Studia przypadków*, Difin, Warszawa 2009, p. 17; R. Martin, P. Sunley, *Deconstructing clusters: chaotic concept or policy panacea?*, "Journal of Economic Geography", vol. 3, 2003, pp. 5-35.

[91] J. Cygler, *Kooperacja przedsiębiorstw*, SGH-OW, Warszawa 2009, pp. 51-52; quoted after: M. Spychała, *Fundusze unijne wspierające tworzenie i rozwój struktur klastrowych na przykładzie województwa wielkopolskiego,* „*Zarządzanie i Finanse. Journal of Management and Finance*", nr 1/2012, p. 46.

ideas for innovations and also make available the research infrastructure[92]. The low level of cooperation with universities is also reflected in imperfect matching of skills and labour supply to the needs of enterprises.

A significant threat to the functioning of clusters is also the pressure from the higher echelon political decision-makers on fast achievement of the effects of realization of policies for clusters. The formation and development of clusters is a long-term process, and the settlement of funds spending requires the report on benefits generated in short term. It may lead the institutions implementing policies for clusters to give up the intervention of long-term impact and to orient to instruments that give a more spectacular but impermanent effects. In Poland there is observed a tendency towards the "top-down" creation of clusters initiated by regional or local authorities[93]. Moreover, in the long term a threat to the process of creating clusters will be the decrease in the inflow of structural funds to Poland. With the termination of public support the activity of some clusters may be substantially reduced. However, on the other hand, taking into account the necessary independence of such structures, the real threat to the development of clusters in Poland is a strong dependence on the EU funds.

It is also worth emphasizing that the excessive concentration of economic activity in extreme cases may lead to the emergence of negative external effects connected with growing pollution and congestion of infrastructure. This is important for the analyses of long-term social costs. The result of such a concentration is also a rise in the lease prices of land and property, as well as, in the case of a limited number of qualified staff, an increase of costs related to human resources. This may adversely affect the price competitiveness of companies operating in the cluster and its environment. The tightening formal and informal links among cluster members may, on the other hand, lead to various types of cartel agreements, mergers and acquisitions between companies, which fact in the long run reduces the number of competitors operating in a given industry. The rapid development of the cluster and its large expansion also brings with it the risks connected with a lack of coordination of actions and problems in information flow and decision-making on key issues related to the whole structure and it may lead the structure to enter the decadent phase[94].

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[92] A. Baranowska, *Klastry zaawansowanych technologii jako instrument wsparcia rozwoju i konkurencyjności regionów – analiza i wnioski dla polityki regionalnej oraz polityki spójności*, IBS, Warszawa 2009, p. 67.

[93] *Ibidem*, p. 69.

[94] T. Rzewuski, *Rozwój klastrów jako innowacyjna forma funkcjonowania zachodniopomorskich przedsiębiorstw*, Zeszyty Naukowe Uniwersytetu Szczecińskiego nr 453, Ekonomiczne Problemy Usług nr 8, Szczecin 2007, pp. 257-258.

CHAPTER III

KEY FACTORS OF DEVELOPMENT OF CLUSTER INITIATIVES AND STRUCTURES

3.1. Cluster development processes

Most of the definitions, including the ones quoted in the previous chapter, present static (structural) character of the cluster. However, some researchers (Rosenfeld, Motoyama, Stachowicz, Mrozowicz, Góra)[95] see the cluster as a dynamic form which is founded on relations and connections between its entities. They believe that the cluster should be regarded as a process.

The process is a set of interrelated resources and actions transforming the input condition into the output condition[96]. The expansion of any system is a chronological series of changes in this system. According to W. Szajna the process of development of clusters should include three stages (spheres):[97]

1. the informal sphere representing the essence of the cluster in which there functions: meeting of representatives of entities of the cluster, the council of the cluster, the group coordinating and managing the process of creating the cluster (optional);
2. the sphere of cluster management including organizational and managerial tasks connected with the functioning of the cluster, which should be dealt with by the (institutional) body established to coordinate the activity of the cluster and to initiate and support the realization of the undertaken tasks (e.g. association);

[95] Cf. S.A. Rosenfeld, *Bringing... op.cit.*; Y. Motoyama, *What Was New About the Cluster Theory? : What Could It Answer and What Could It Not Answer?,* Economic Development Quarterly 2008 22: 353 originally published online 9 September 2008, http://edq.sagepub.com/content/22/4/353; J. Stachowicz, L. Knop, *The concept of of cluster creation and development* [in:] E. Bojar (ed.), *Cluster. Politics. Management. Good clustering practices in the world,* Lublin 2009, pp. 63-81; J. Góra, *Dynamika klastra: zarys teorii i metodyka badań*, Wyd. I-BiS, Wrocław 2008.

[96] In the sciences of organization and management comprehensive processes of the enterprise as the subject of analysis and design appeared already in the work of F. Taylor entitled "The Principles of Scientific Management" in 1911.

[97] W. Szajna, *Jakie są główne etapy procesu tworzenia klastrów?* - http://klasterzit.pl/pl/home/najczesciej-zadawane-pytania/112-jakie-sa-glowne-etapy-procesu-tworzenia-klastrow (access on 20.02.2015).

3. the sphere of cluster initiatives (joint actions, undertakings), for realization of which the cluster was mainly founded.

Thus, the process of development of clusters is understood as a set of resources and actions occurring from the moment of formation of the cluster structure to its bankruptcy or transformation.

K. Mrozowicz defines a cluster as a "process-determined structural-functional organizational system operating on the basis of administrative and legal rules in a certain socio-economic environment, whose effectiveness is conditioned by the impact of the external environment and the characteristics of its internal conditions, their mutual coincidence and interdependence, which in total are influenced by the general system processes, mainly: homeostasis, synergy, entropy, specialization and equivalence"[98]. Giving the fundamental importance to the dynamic functions realized within the cluster, the above-mentioned author proposes a model of cluster, showing in it the relations between the static elements of the discussed organizational structure and the dynamic processes realized within its organizational framework (see Table 6).

Table 6

Structural and functional attributes of the cluster

Structural attributes of the cluster (the cluster as organizational structure)	Functional attributes of the cluster (the cluster as organizational process)
– government agencies, local government, authorities and administration of different levels, – universities, research and development centres, scientific institutes, – bridging institutions, business environment, consulting companies, business incubators, development agencies, technology transfer centres, industry associations, – financial, insurance, consulting, technical, legal institutions, – companies, manufacturers, suppliers, consignees, service providers, sales centres, – the infrastructure and industrial parks along with superstructure resources, – government programs, the EU programs, – the land use policy for a given administrative.	– generating and maintaining market advantage due to a consistent policy as a result of recognizing and exploiting specific local resources, – aggregation of entities to the critical mass of the cluster, – local concentration of entities of the cluster, – cooperation and competition in the perspective of functional relations (formal and informal), – vertical and horizontal trans-sectoral networks of relations within the identical or related industries, – transfer of organizational resources (factors of production, knowledge, marketing strategy, etc.), – creating a climate of internal identity, organizational culture and ethical behaviour towards strategic partners and competitors, – creation and promotion of mainly local culture of entrepreneurship and innovation.

Source: K. Mrozowicz, *Klastry przedsiębiorczości z perspektywy teorii organizacji*, „Nauka i Gospodarka", Kraków 2010, p. 65.

[98] K. Mrozowicz, *Klastry przedsiębiorczości z perspektywy teorii organizacji*, „Nauka i Gospodarka", Kraków 2010, p. 65.

3.2. Economic determinants

Economic factors conditioning the emergence and development of cluster initiatives can be seen as a source of competitive advantage leading to the initiation and expansion of clusters and obtaining competitive advantages. They cover interacting factors which, with reference Porter's analytical convention, can be divided into supply, demand and structural factors[99]. To the supply factors can be classified:

- the quality and cost of natural, capital and human resources;
- the quality and cost of material and immaterial infrastructure facilitating the access to resources and supporting the actions of enterprises (administrative, legal, informational, scientific-research infrastructure, social factors related to the quality of life of the sector's community such as security, order or the conditions for leisure activities);
- legal regulations concerning international trade[100] and foreign investments;
- resources coming from outside the sector along with foreign investments;
- formalized social relations;
- nonformalized social relations (atmosphere conducive to economic activity and work and unspecified, nonformalized relations accompanying trade contacts between enterprises of vertical dimension).

And among the demand factors there can be listed:[101]

- demanding and sophisticated local customers forcing enterprises to continuously improve;
- current and future needs of customers satisfied by the segments from outside the cluster;
- the local demand disclosing market sectors in which enterprises can differentiate themselves (specialize), while the quality of the local demand is more important than the actual size of the market;
- barriers connected with entry into external markets and the legal regulations on export;
- unforeseen events in the global market which may increase the demand for the sector's products;
- external markets;
- social factors connected with formalized social relations.

It is worth noting that a significant source of competitive advantages can also be structural factors shaping the context for strategy and rivalry of given enter-

[99] Cf. M.E. Porter, *On Competition,* HBS Press, Boston 1998; M.E. Porter, *Clusters and the New Economics of Competition*, Harvard Business Review, Nov-Dec 1998, pp. 77-90; quoted after: S. Figiel, D. Kuberska, J. Kufel, *Analiza... op.cit*., p. 35.

[100] Cf. *Tradycyjne i nowe kierunki rozwoju handlu* międzynarodowego, S. Wydymus, M. Maciejewski (ed.), CeDeWu, Warszawa 2014.

[101] *Ibidem*, pp. 35-36.

prises and strategies of enterprises in related and supporting industries. The factors shaping the context for strategy and rivalry include standards and legal regulations and incentives and norms determining the types and intensity of competition of local companies in a given industry. These include, in particular:[102]

- the local context which encourages appropriate forms of investment and supports modernization;
- strong competition between local rivals;
- the structure of tax system;
- systems of enterprises management[103];
- labour market policy;
- intellectual property laws;
- local policy regarding anti-trust actions and corruption fighting.

Generally speaking, the weak competition in a given sector or industry means the low efficiency of enterprises, lack of innovation and, apart from imitation, a low level of investments aimed only at material resources[104]. An important role in this respect is played also by the presence and strategies of enterprises in related and supporting industries, to which there should be classified local suppliers and companies from related branches, conducting the activity which is complementary to the activity of companies in a given industry. It is worth noting that also the factors connected with formalized social relations are not insignificant.

The analysis of the sources of competitive advantages of the sector is often called the structural analysis of the sector. An important thing is that although in every sector the formation of competitive advantages is influenced by different forces, some of them are crucial. It seems that in the agri-food sector the most important of them are the bargaining power of buyers and potential entering entities (sectors from other countries), and with reference to individual industries of the sector the most important force are competitors in the sector (e.g. for a particular producer of pork these will be not only other producers of this meat but also producers of poultry meat).

Commencing the study of the structure of a given sector one should also focus on the analysis of the intensity of individual competitive forces, and not only on the analysis of factors that may temporarily affect competition and profitability. Such factors can be, for example: fluctuations in economic conditions in the economic cycle, shortages of raw materials and materials, strikes and lockouts, periodic, sudden increase in the demand. It is rather about distinguishing the basic character-

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[102] *Ibidem*, p. 36.

[103] Cf. *Informacja i wiedza w zintegrowanym systemie zarządzania,* R. Borowiecki, M. Kwieciński (ed.), Kantor Wydawniczy ZAKAMYCZE, Zarządzanie-Ekonomia-Marketing, Kraków 2004.

[104] More information on innovation in the context of competition of Polish enterprises can be found, among other things, in the publication: K. Firlej, D. Żmija, *Transfer wiedzy i dyfuzja innowacji jako źródło konkurencyjności przedsiębiorstw przemysłu spożywczego w Polsce*, Wyd. UEK w Krakowie, Kraków 2014.

istics of a particular sector of economic and technological nature than identifying the factors which influence profitability of all sectors in short periods. The structural analysis is in fact usually used for strategic and not tactical decisions, and its goal is to understand the essence of the sector's structure.

It should be particularly emphasized here that this study is not strictly devoted to the structural analysis of each of the industries of the agri-food sector in Podkarpackie Province, but to the assessment of the conditions of formation and development of the agri-food clusters in Podkarpacie (sometimes in the context of the all-Poland or global determinants). Thus, the supply, demand and structural determinants in respect of the entire agri-food sector are the subject of the analysis presented in this part of the study. In contrast, the individual industries of this sector will be referred to only as examples, without separate discussion.

3.2.1. Supply determinants

Pointing to the key supply factors conditioning the expansion of cluster relations in agribusiness, there should be mentioned land and other natural resources, labour resources, availability of capital and direct foreign investments, informational and research-development infrastructure and opportunities in the field of international trade[105]. Poland ranks ninth in Europe in terms of surface and eighth in terms of population. Located centrally in Europe it has a rich history of agriculture. Against the background of the population, the agricultural area approximating to 15,5 million hectares should be considered relatively high. The per capita area of arable land is on average by 30% higher than in the EU, which allows using it less intensively. The possibilities of using agricultural land are multidirectional[106].

According to the results of the Agricultural Census in 2010, 68% of the total arable land area (47,8% in Podkarpacie) were sown, 2,3% were orchards, and 21% grassland (in Podkarpacie: 1,6% and 25,2% respectively)[107]. The quality of the land is characterized by high dispersion, but in general it can be said that the arable land is relatively of good quality. The best wheat-beet land is in Żuławy, Kujawy, Lublin Upland, Roztocze, Sandomierz Basin and Silesian Lowlands. Spatial diversity of the character of agricultural production results mainly from different natural conditions, in particular soil quality. There is also a noteworthy increase in the cultivated areas in the ecological farming system.

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[105] Cf. *Bezpośrednie inwestycje zagraniczne a konkurencyjność eksportu Polski*, S. Wydymus, E. Bombińska, B. Pera (ed.), CeDeWu, Warszawa 2012; *Handel międzynarodowy w dobie gospodarki opartej na wiedzy*, S. Wydymus, A. Głodowska (ed.), Wyd. Difin, Warszawa 2013.

[106] *Rolnictwo i gospodarka żywnościowa w Polsce,* T. Jabłońska-Urbaniak (ed.), MRiRW, Warszawa 2010, pp. 31-32.

[107] Powszechny Spis Rolny 2010, GUS, Warszawa 2011; *Charakterystyka gospodarstw rolnych w województwie podkarpackim,* Powszechny Spis Rolny 2010, Urząd Statystyczny w Rzeszowie, Rzeszów 2012.

When analyzing the Polish labour resources in agriculture it should be noted that they are large. There are employed nearly 2 million people (approximately 0,26 million in Podkarpacie), i.e. approximately 12 people per 100 hectares, which constitutes 14,7% of the total employment compared to 5,8% in the EU[108]. A larger number of working people per 100 hectares of agricultural land, as K. Zieliński states, creates greater opportunities for concentration of activity on a more labour-intensive cultivations, thus increases the scale of maneuver in shaping the structure of the generated production[109]. It is worth noting that currently every other head of farm gains income from non-agricultural activity, often undertaking economic activity. An interesting phenomenon is the fact that the numbers of farms systematically falls but at the same time their areas increase. In the area structure there dominate very small farms up to 1 hectare in area (approximately 44,4% in Podkarpacie at the national average of approximately 31,4%) and small of 1-5 hectares in area (approximately 45,6% at the national average of approximately 37,9%). To the highly competitive and strong export position of the Polish agricultural production there primarily contribute several hundreds of thousands of large farms. On farms exceeding 15 hectares in area there is located approximately 50% of the total agricultural land (26,6% in Podkarpacie). In the period 2002-2010 the average area of a farm increased by 13% points (by 3,9% points in Podkarpacie), while the number of small farms (of less than 5 hectares in areas) fell by 23% points (by 15,5% points in Podkarpacie)[110].

The positive changes, occurring in the last few years, in the capital equipment of the Polish farms are mainly related to the accession of Poland to the EU. Within the CAP, farmers receive direct payments (per hectare) and can apply for funds within many programs of the second pillar (Rural Areas Development Programme). Within the Rural Areas Development Programme there are allocated funds for improvement of competitiveness of the agricultural and forestry sector, improvement of the natural environment and rural areas, improvement of the quality of life in rural areas and diversification of the rural economy, creation of local action groups, technical assistance. Within this program for the period 2004-2013 there was used the amount of approximately 47 billion zloty, thereby placing Poland in the position of leader in the realization of the program[111].

It is worth noting that in recent years there was also made a significant progress in the technical equipment of farms, in quantitative and qualitative terms. However, there are observed not many initiatives in the field of joint investments, e.g. within

[108] M. Sawicki, *Polish Vision of the CAP after 2013: Against a Back-ground of Economic Transformation and EU Membership*, EuroChoices, 10(2)/2011.

[109] K. Zieliński, *Elastyczność podaży produktów rolniczych w Polsce*, Wyd. AE w Krakowie, Kraków 2002, p. 103.

[110] *Ibidem.*

[111] T. Jabłońska-Urbaniak (ed.), *Rolnictwo... op.cit.*

producer groups, by which the devices could be used more effectively and there could be achieved economies of scale. Thanks to the accession of Poland to the EU there also gained the Polish food industry which in recent years has been modernized, better promoted and has become more competitive on the local, regional and international markets. A threat to profitability of this sector may be the rising prices of agricultural produce and the market pressure from sales networks[112].

As a result of the impact of foreign direct investment (FDI) in the Polish agri-food sector there has been made a significant progress reflected in the renewal and expansion of production assets, modernization of food processing plants, growth of exports and better access to trans-regional distribution networks. In addition, a large increase is observed in the degree of processing of agricultural products, labour efficiency and the development of general economic infrastructure. However, currently foreign investments and resources flowing with them are perceived as competition rather than a factor of development for the rapidly developing domestic plants (except for areas with a high unemployment rate)[113].

Pointing to the information infrastructure of the Polish agriculture, it should be noted that its key element is the functioning Agricultural Information System. This system performs the following functions: describing entities and objects, events and processes of the agricultural market; forecasting future events and processes in the market; support ing the development of new solutions in the area of products and market activities; evaluating the efficiency and effectiveness of the CAP and the quality of work in their realization (descriptive, prognostic, innovative, controlling functions)[114].

The R&D infrastructure is made by a number of different entities, but in the research for the analyzed sector there are engaged 13 research and development units subordinate to the Minister of Agriculture, but also 9 scientific centres of the Polish Academy of Sciences and the universities (with 47 faculties) supervised by the Minister of Science and Higher Education. At the same time, six of the R&D units have the status of the National Research Institute. The problems in the field of agricultural sciences are carried out also in some units subordinated to ministries of economy, environment, health and work. The funds for R&D purposes are gained mainly from budgetary subsidies of the Ministry of Science and Higher Education, and as a result of the reduction of the pool of funds for statutory activity, additional funds are obtained from: participation in international programs of scientific and technological cooperation, tasks commissioned by the business sphere, but also from credits, loans and leases[115].

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[112] S. Figiel, D. Kuberska, J. Kufel, *Analiza... op.cit*., pp. 37-56.

[113] Ministerstwo Gospodarki i Polityki Społecznej, *Bezpośrednie inwestycje zagraniczne w Polsce według stanu na koniec 2012 roku* - http://www.mg.gov.pl (access: January 2014).

[114] Cf. W. Rembisz, M. Idzik, *Rynek rolny w ujęciu funkcjonalnym*, Wyższa Szkoła Finansów i Zarządzania, IERiGŻ, PIB, Warszawa 2007.

[115] T. Jabłońska-Urbaniak (ed.), *Rolnictwo... op.cit*.; S. Figiel, D. Kuberska, J. Kufel, *Analiza... op.cit.*

Within the EU there applies freedom of movement of goods between the member states. Also Poland is a part of this common market. The member states do not conduct their own commercial policy with third countries, but are represented by the Union institutions within the common commercial policy. The agricultural sector is additionally covered by the common agricultural policy which regulates not only agricultural production but also trade in agricultural products. In addition, the member states have at their disposal the instruments within the national policies which are, however, constantly reduced (especially in terms of quality and volume of production)[116].

3.2.2. Demand factors

The determinant of the demand for food in the global perspective is the number of population and the level of their incomes[117]. Regardless of the assumptions underlying the various demographic projections, it should be expected that within the period till the year 2050 the world population will continue to grow to reach the level of approximately 9 billions. In turn, when it comes to incomes in the world, being a derivative of the productivity of individual economies, crucial will be the changes in the level of GDP in big countries hitherto considered poor[118].

In the structure of expenditures of total Polish households the main position is occupied by the expenditures on food and soft drinks – their share in 2010 in the total expenditures amounted to 24,8%[119]. As a result of changes in food prices there may increase its share in the expenditures of households, there is also possible a change of the structure of consumption. It is worth noting that the structure of consumption actually changes due to fashion and changing tastes of consumers. Taking into account the trends observed in Poland in the last 20 years, they pointed to the growing consumption of such products as: fruits, poultry meat, vegetable fats, fish, and less animal fats, sugar and milk. There remained relatively stable the level of total consumption of meat, but there decreased the consumption of beef, sheep and goat, and increased the consumption of poultry meat, with a relatively stable consumption of pork. Yet in the last decade of the last century, the consumption of cereal products per capita in Poland was among the highest in Europe[120]. However, for several

[116] Cf. A. Czyżewski, A. Henisz-Matuszczak, *Rolnictwo Unii Europejskiej i Polski. Studium porównawcze struktur wytwórczych i regulatorów rynków rolnych,* Akademia Ekonomiczna w Poznaniu, Poznań 2006.

[117] Cf. S. Figiel, W. Rembisz, *Przesłanki wzrostu produkcji w sektorze rolno-spożywczym – ujęcie analityczne i empiryczne*, IERiGŻ, PIB, Warszawa 2009.

[118] S. Figiel, D. Kuberska, J. Kufel, *Analiza... op.cit*.

[119] Powszechny Spis Rolny 2010, GUS, Warszawa 2011.

[120] A. Borowska, *Wzorce konsumpcji żywności w krajach Unii Europejskiej w latach 1990-2000,* „Oeconomia", Vol. 1, No. 1-2/2002, pp. 67-75; S. Figiel, D. Kuberska, J. Kufel, *Analiza... op.cit*.

years the domestic consumption of bread and other types of breadstuffs has systematically been falling.

In the analysis of demand determinants of the emergence and expansion of agri-food clusters there should be taken into account the qualitative aspects of the demand for food. In behavioral patterns of societies there are observed specific megatrends such as convenience of consumption or the interest in food safety and healthful properties. There becomes visible the consumers' increasing attention to the form and quality of consumed food. There also appear new groups of sophisticated consumers showing preferences previously unobserved or having little market significance. According to Porter's approach[121], with respect to the agri-food sector there should be indicated many different demand sources of potential competitive advantages determining the creation and development of cluster structures in the Polish agribusiness. Among other things they include:[122]

- demanding and increasingly sophisticated local customers forcing the companies to continuously improve their market offers;
- current and future needs of customers met by other sectors related to the agri-food one;
- the local demand disclosing various segments of the market, due to which the enterprises can specialize or vertically integrate;
- barriers connected with entry into external markets and the laws regulating the export;
- the development of external food markets;
- elasticity of response of the supply side to changes occurring on the demand side, including changes in consumers' behaviour;
- sudden, unexpected events in the global market exerting a significant influence on the demand for products of the domestic agri-food sector.

A trend which is more and more noticeable in Poland is the increasing interest in healthy food produced with ecological methods. A notable fact is the increase in the demand for high quality food: firstly, one may mention the health quality, and secondly – the taste quality. There grows the interest in products having quality certificates, certificates of traditional or regional food, as well as the original, little processed products purchased directly from the farmer. Fresh and little processed products, small portions and meals ready for consumption are increasingly preferred. Appropriate packaging and proper processing of the product become important. There also expands the group of people interested in ecological products in production of which chemical agents for cultivation of plants are not used. However, these are expensive products and still a relatively small percentage of wealthy consumers can afford them[123].

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[121] Cf. M.E. Porter, *On Competition... op.cit.*; M.E. Porter, *Clusters... op.cit.*, pp. 77-90.

[122] S. Figiel, D. Kuberska, J. Kufel, *Analiza... op.cit.*

[123] *Ibidem*; A. Klimas, *Żywność ekologiczna coraz częściej poszukiwana* - http://www.raportrolny.pl (access: January 2014).

A significant observed phenomenon affecting the demand for agricultural products is the growing importance of renewable energy and biofuels. This trend is related to the EU decision of 2007 with regard to the 20-20-20 objective. The European Council announced that by 2020 it will reduce the greenhouse gas emissions by 20% compared to the emissions of 1990, increase by 20% the share of renewable energy in the final energy consumption, improve by 20% the energy efficiency (reduction of primary energy consumption), achieve in 2020 the 10% share of biofuels in overall consumption of transport fuels. In each of the member states there were adopted different objectives taking into account the diverse conditions. Within the Polish energy policy until 2030 it is planned: to improve energy efficiency, increase energy security, develop the use of renewable energy sources including biofuels, develop competitive fuel and energy markets, limit the impact of the energy industry on the environment[124].

3.2.3. Structural determinants

The prospect of probable benefits from functioning of cluster structures for enterprises and regions encourages potential participants to engage in this type of activity which, however, is determined by many internal and external factors. The analysis of direct and indirect environments of the cluster structure becomes an important element. The purpose of the analysis of the competitive environment, pointing to its structural determinants, is to ensure the effectiveness of the strategic approach of the cluster and to define short- and long-term consequences of action in specific segments of the market. The analysis also allows better estimation of chances for coming into existence in a given segment and shows the barriers, the removal of which may be one of the important actions of the cluster structure. The most important advantage of this method of analysis is systematizing and ordering of the way of looking at products of the cluster and the competitive environment. However, it may turn out that the problem is the industrial orientation of the model requiring adaptation to products and service segments. It should also be noted that the model does not take into account certain important qualitative factors in developing the enterprise's market position such as the role of cooperation and strategic alliances. Porter's five forces model[125] is often used separately to analyse each segment identified in earlier analyzes. In most cases the clusters are focused on one or more products or segments of the market[126].

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[124] T. Jabłońska-Urbaniak (ed.), *Rolnictwo... op.cit.*; *Nowa era biopaliw*, Komisja Europejska - http://ec.europa.eu/polska/news/121017_biopaliwa_pl.htm (access: February 2014).

[125] Using this instrument may help estimate the attractiveness of a given segment of products, however, it is not a univocal indicator of profitability (and future profit) since companies of the same industry can use different business models and obtain different incomes within them.

[126] *Inicjatywy klastrowe... op.cit.*, p. 25.

M.E. Porter proposes an analysis of the sector of activity by examining five factors influencing its attractiveness for the current and future investors:[127]

I. The impact of the suppliers and their ability to exercise pressure on the entities in the sector;
II. The impact of buyers and their ability to exercise pressure on the entities in the sector;
III. The intensity of competitive rivalry within the sector;
IV. The threat of emergence of new producers;
V. The threat of emergence of substitutes.

The development possibilities and attractiveness of the sector are smaller if there is a stronger pressure on the sector on the part of suppliers and buyers and if there are greater possibilities of entering of new entities into the sector or appearance of substitutes on the market, and also if there is a sharper competition between producers within the sector. In Porter's model the relations between the mentioned factors determine the intensity of competition within the sector and, consequently, its profitability.

Agri-food sectors from different countries in the areas of selected industries compete with each other using various ways, including price competition, advertising campaigns, introduction of new products, a greater range of customer service, warranties and so on. Using these methods is either a necessity or opportunity to improve their own positions. The actions of representatives of the industry in one country result in counteractions of companies in the industry in other countries. They usually decide to retaliation or neutralizing actions. Companies in these industries are mutually dependent. The game conducted between them may improve the situation of the industry in a given country, however, it often happens that the whole industry will be found in a worse situation. In particular, price competition may worsen the profitability of the whole industry (an example is the poultry industry). On the other hand, advertising campaigns often contribute to the increased demand and greater diversity of products, which can be favourable for all companies. In this case an example may be the dairy industry (e.g. yoghurts, cheeses)[128].

Pointing to the competition in the Polish agri-food sector it should be concluded that it differs in strategy, origin or character. The companies in the agri-food sector competing with one another have therefore difficulties with reading each other's intentions and rules of the game. Small companies often decide on the rate of profit below average since it is more important for them to maintain the independence resulting from ownership of the company. In many industries in the agri-food sector there also appear companies which use dumping prices, treating the particular

[127] G. Gierszewska, M. Romanowska, *Analiza strategiczna przedsiębiorstwa*, PWE, Warszawa 2002, pp. 98-99.

[128] S. Figiel, D. Kuberska, J. Kufel, *Analiza... op.cit.*

market as a place for disposing of production surplus, while for other companies it is the main market. Competition in the agri-food sector is also intensified by companies which in their strategic actions assume gaining specific markets in order to diversify activity, achieve prestige or technical credibility.
It is worth emphasizing here that the agri-food sector is classified to sectors with low rate of profitability. Both the processing industry and agriculture cannot count on the margins comparable with the sector of services or high technologies. But the enterprises, despite the low rate of profit, function in their respective industries. The reason is the difficulties with exiting from a given sector (economic, strategic and even emotional), called the exit barriers[129].

However, in general, the entry barriers for the Polish agri-food sector are relatively low. This means that deriving benefits from new solutions is not free from the fear that new competitors will follow this way. The main entry barriers include: economies of scale, diversification of products, capital needs, costs of changing the supplier, access to distribution channels, worse cost situation (regardless of the scale) and state policy[130]. It is worth adding that the entry barriers may change, e.g. patents expire, the differentiation of products in certain industries reduces or, due to automation, the economies of scale increase. The barriers are also affected by strategic decisions of companies, e.g. quick introduction of new products, intensive advertising, expansion of distribution, vertical integration. Some companies also have the resources and skills due to which the cost of overcoming the entry barriers is lower for them. These could be, for example, developed distribution channels or the ability to divide related costs to a higher than before number of types of products.

In assessing the structural conditionings for development of the agri-food sector, for each of its industries there should be pointed substitutes which can fulfill a similar role as the products of this industry. Substitute products may at the same time belong to relatively remote areas of economy. The biggest threat are the products which can effectively replace the products of a given sector due to the relation of price to quality and the products manufactured by the sectors achieving high returns. They contribute significantly to the increase of efficiency, but also to the decrease of prices. The identification of such substitutes may entail a decision on a strategic blockade of the substitute's way to the market or on adapting the strategy, treating a specific product as an inevitable fundamental force. It is worth emphasizing here that the key structural conditioning constitutes the presence and strategies of local suppliers from competing related industries who are companies performing activities that are complementary to the activities of enterprises in a given industry (e.g. fertilizers, fuels, pesticides,

[129] *Ibidem*; M.E. Porter, *Strategia konkurencji. Metody analizy sektorów i konkurentów,* MT Biznes, Warszawa 2010.

[130] M.E. Porter, *Strategia... op.cit.*

agricultural machinery, etc.). The bargaining power of suppliers consists in the fact that they can raise prices or lower the quality of sold goods and services. It leads to a reduction in profitability of the sector which is not able to cover the rising costs by higher prices. Thus, it can be concluded that the buyers' strength is a mirror image of the suppliers' strength[131].

3.3. Institutional factors

The conceptual meaning of institution is very broad and interprated in different ways by the representatives of individual scientific disciplines. According to D.C. North[132], a representative of the new institutional economics, it means stable, legal, organizational and customary conditionings for repetitive human behaviour and interpersonal interactions. It follows that the institution is a group of functionally related legal norms and principles, as well as a separate organizational structure (organizations) and the mechanisms of its functioning.

Institutional factors determine the effectiveness of interaction between the system of knowledge and the economy, and as a result the efficiency of functioning of the knowledge economy. Most often they are treated as certain conditions under which there is carried out the activity based on the development or use of knowledge. In practice, however, these determinants are of fundamental importance and play an active role in the system of knowledge-economy interactions, especially in the case of innovative solutions. Therefore, the institutional conditionings can be defined as a set of features, states, phenomena and processes of an institutional nature, having a significant impact on the scope, form, rate and capacity of the development and functioning of the knowledge economy. They are, therefore, those elements that relate to the general framework of interactions between knowledge and the economy, proper shaping of which increases the efficiency of these interactions[133].

The institutional sphere is the most important factor differentiating the economic development of regions, industries or entire national economies. It consists of a complex network of formal and informal institutions; some of them develop for a long time and change slowly. This applies particularly to social institutions, called informal institutions, the examples of which are moral norms, ethics, traditions, established patterns of behaviour or ways of thinking. Formal institutions are a system of legal norms and organizations appointed for enforcing them, as well as a complex system of different types of economic,

[131] S. Figiel, D. Kuberska, J. Kufel, *Analiza... op.cit*.

[132] D. C. North, *Institution, Institutional Change and Economic Performance*, Cambridge University Press, 1990.

[133] K. Stachowiak, *Czynniki instytucjonalne w budowaniu i funkcjonowaniu gospodarki opartej na wiedzy – przykład Finlandii*, [in:] J. J. Parysek, T. Stryjakiewicz (ed.), *Region społeczno-ekonomiczny i rozwój regionalny*, Bogucki Wydawnictwo Naukowe, Poznań 2008, p. 124.

political, social and cultural organizations that govern the behaviour of people in those areas of life and determine the effects of this behaviour, including the economic effects[134].

3.3.1. Institutions supporting development of clusters

One of the features which distinguish clusters, as mentioned earlier, is the intensification within them of relations between groups of entities of a different nature, namely enterprises, representatives of the authorities, scientific and research institutions and business environment. To the group of institutions supporting the development of clusters in Poland there can be classified:[135]

- Ministries (a special role in this respect is played by the Ministry of Economy and the Ministry of Regional Development),
- local government bodies,
- national and regional agencies (including, for example, PARP *(the Polish Agency for Enterprise Development)* and Regional Development Agencies),
- technological parks,
- special economic zones,
- business incubators,
- universities and related technology transfer centres, research institutes and other entities in R&D sphere,
- cluster initiatives,
- trade associations,
- others, whose activity directly or indirectly affects the functioning of clusters.

Entities taking part in the process of clustering can be classified according to the range of impact. In this way, the list of entities affecting the clusters is divided between the following levels: central, regional and local (Table 7).

Table 7

Participants in the process of creating clusters

Central level	Regional level	Local level
– regional policy – industrial policy – scientific policy	– regional public bodies – regional organizations	– companies – local government bodies – universities

Source: S. Figiel, D. Kuberska, J. Kufel: *Analiza... op.cit*., p. 57 based on: Ö. Sölvell: *Clusters – Balancing Evolutionary and Constructive Forces.* Ivory Tower, Sztokholm 2009.

A problematic issue can be the synchronization of actions of individual entities undertaken for the development of cluster structures that would prevent their

[134] A. Walenia, *Infrastruktura instytucjonalna jako czynnik wspomagający proces tworzenia klastra w branży rolno-spożywczej Podkarpacia,* Zeszyty Naukowe Kolegium Gospodarki Światowej Szkoły Głównej Handlowej w Warszawie nr 32/2011, pp. 512-531.

[135] S. Figiel, D. Kuberska, J. Kufel, *Analiza... op.cit*. p. 57.

duplication and blurring of responsibility for its development, which leads both to the development of a coherent and clear clusters-based policy which will be discussed in the next subsection. Institutional factors have a significant influence on shaping of the market processes whose course determines development of competitive advantages, not only for individual enterprises, but also for the economy of a given region or country.

The research results confirmed[136] that the clusters functioning in a worse institutional environment are weaker and narrower, which showed the essential importance of the institutional potential developed through active cooperation and internal socio-cultural factors of the region. There are specified six necessary elements of the strategy of development of cluster structures:

1. improvement of the business environment (among other things, by taking into account the needs and expectations of the supported cluster structures);
2. providing information and data about the economic forecasts in order to identify opportunities and threats to the development, and, as a result, enabling taking advance corrective actions;
3. continuous development of the infrastructure and education and training offer;
4. implementing effective methods of companies networking;
5. financing the business environment, including the creation of support structures enhancing the establishment of new companies;
6. improvement of the quality of local relations, including building of mutual trust.

However, pointing to the role of institutions in the development of cluster structures, the OECD distinguishes four forms of relations in the innovation system of the cluster:[137]

1. the enterprise-enterprise relations, e.g. joint R&D activity, common products, patents;
2. the relations company – science and research sphere institutions and public institutions of technology transfer (joint R&D activity);
3. the market transfer of technology, i.e. the diffusion of knowledge and innovation by, for example, the purchase of machinery, equipment, licensing (indirect expenditures on R&D);
4. mobility of workers and the transfer of tacit knowledge.

As a feature supporting a higher level of innovation and thus competitiveness of enterprises in industrial clusters can be assumed a kind of institution managing such a group. Basing on the research[138] it was found that economic clusters are most often formed by associations – 47,1%, then by universities – 23,5%, scientific and technological parks – 17,6%, commercial companies – 11,8% and agencies – 5,9%. In the case of

[136] Cf. T. Brodzicki, S. Szultka, *Koncepcja… op.cit.*

[137] I. Czajkowska, *Wpływ klastrów gospodarczych na innowacyjność przedsiębiorstw*, „Economy and Management", nr 1/2010, pp. 107-114.

[138] J. Hołub-Iwan, M. Małachowska, *Rozwój klastrów w Polsce. Raport z badań*, Szczecin 2008, p. 17; quoted after: I. Czajkowska: *Wpływ... op.cit.*, p. 112.

41,1% of cluster initiatives the managing institution is a university or science and technology park, which seems to be a prerequisite to higher-than-average innovation of enterprises.

In the case of the agri-food sector in Poland the factors for the success of the functioning and potential clusters are undoubtedly the scientific and research and development institutions and, which are the elements of the innovative business environment. The importance of this environment increases in the face of development of the knowledge economy[139]. The success of efforts to develop the agri-food clusters is dependent on the quality of services provided by these institutions. On the one hand, the issue of transfer of knowledge and strengthening the innovation of enterprises and the economy is connected with the offer of agricultural universities in Poland. In their structures is formed the future staff that develops the resources of human capital. In addition, the results of scientific research conducted there should be applied in the economy. On the other hand, the innovation of the sector is also affected by research and development units, laboratories and government research institutes which are subject to the relevant ministries, including the Ministry of Agriculture and Rural Development. According to A. M. Kowalski, the cooperation between R&D sphere and the sector of enterprises, occurring within clusters, increases the chance of implementing the results of research and development works in enterprises by creating better opportunities for directing the researchers' work towards the needs of enterprises.

3.3.2. The policy of support for cluster structures

The importance of clusters from the point of view of building clusters of enterprises with significant potential for the creation of innovative solutions should be considered as a key element paying a particular attention to all initiatives related to the support for this type of activity. Such initiatives are actually needed in order to enable the existing cluster structures to develop, and the new ones to be created. Thus, one of the most important objectives of the current innovation policy is to build interactions and cooperation between enterprises and between enterprises and scientific entities. This is supported by, among other things, the interactivity feature, occurring in today's economy, of the innovation process, which is characterized by interdependence of individual stages of the process and the presence of many feedbacks between them[140].

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[139] Cf. A. M. Kowalski, *Rola klastrów w intensyfikacji współpracy nauki z gospodarką*, [in:] M. A. Weresa (ed.), *Polska – Raport o konkurencyjności 2010. Klastry przemysłowe a przewagi konkurencyjne.* Oficyna Wydawnicza SGH, Warszawa 2010; quoted after: S. Figiel, D. Kuberska, J. Kufel: *Analiza… op.cit.*, p. 61; *Klastry w agrobiznesie. Uwarunkowania funkcjonowania i wpływ na rozwój lokalnej przedsiębiorczości*, D. Bobrecka-Jamro, W. Jastrzębska, E. Szpunar-Krok, B. Tuziak (ed.), Wyd. Difin, Warszawa 2008, p. 105.

[140] A. M. Kowalski, *Kooperacja w ramach klastrów jako czynnik zwiększania innowacyjności i konkurencyjności regionów*, „Gospodarka Narodowa", nr 5-6(225-226)/2010, p. 10-11.

The cluster-based policy is the result of increased interest in the issues of clustering, both in scientific circles and the endeavour to implement these solutions in economic practice. It may be considered as a new type of regional development policy in which the starting point is the presence of agglomeration of economic processes in relation to a specific industry and related industries. The functioning of clusters is based on developing relations of competitive and cooperative types, and cooperative actions relate to, among others, the connections between the sphere of enterprises and the research and scientific sphere. A lot of emphasis within the framework of this policy is also put on the occurrence of public-private partnership.

According to the definition[141], the cluster-based policy is "a set of activities and instruments used by the authorities at various levels to improve the level of competitiveness of the economy by stimulating the development of the existing or creating the new cluster systems primarily at the regional level". In turn, while pointing to the position of the European Union on the support for development of clusters, they are referred to as the structures stimulating the development of enterprises. The guidelines addressed to government authorities influencing the process of clustering refer to accelerating the processes initiating or supporting the development of clusters and to the assistance for the developing relations between the entities creating the cluster[142].

It is worth noting that the policy supporting the development of clusters is always accompanied by the policy of promoting competitiveness and innovation. According to Skawińska and Zalewski, the current policy of competition is of a multifaceted character. These authors emphasize that the authorities take an active role in the process of structural changes, focusing their actions, among other things, on the support for micro-competitiveness. In addition, they can influence the process of inflow of foreign direct investment[143].

From the point of view of central and regional authorities, the impact on the functioning of clusters may be exerted directly or indirectly, in many areas of the policy created by them. Table 8 presents the summary of the areas of conducted policy influencing the processes taking place in relation to clusters.

The origins of the support for the efforts aimed at the development of clusters in the EU date back to the beginning of the nineties of the twentieth century. The research carried out within the framework of the project *Europe Innova* concerning the mapping of clusters shows that in most European countries the period in which the cluster-based policy was initiated were the years 1990-1994 and 2000-

[141] Cf. T. Brodzicki, S. Szultka, P. Tamowicz, *Polityka wspierania klastrów. Najlepsze praktyki. Rekomendacje dla Polski*, Instytut Badań nad Gospodarką Rynkową, Gdańsk 2004.

[142] J. Staszewska, *Klaster perspektywą dla przedsiębiorców na polskim rynku turystycznym*, Wydawnictwo Difin, Warszawa 2009.

[143] E. Skawińska, R.I. Zalewski (ed.), *Klastry... op.cit.*

2004[144]. In Poland, the actions serving the support for cluster activities were started in the financial perspective 2000-2006, and more specifically in 2004-2006[145].

Table 8

Implications of actions within the scope of the policy oriented to functioning of clusters

Area of policy	Consequences
Science and innovations	Clusters whose activity is connected with the results of scientific research, they are dependent on investments in science and technological development.
Competition	The competition is a prerequisite for the occurrence of dynamic clusters.
Trade	Relations with global markets are of key importance for the development of clusters.
Integration	Due to developing integration the clusters gain access to resources whose flow takes place due to the elimination of barriers (for some clusters it is a favourable situation, for others unfavourable).
Regional policy	Clusters benefit from regional development programs.
Social policy	Raising the attractiveness of clusters takes place together with ensuring the access to public services of higher quality.

Source: S. Figiel, D. Kuberska, J. Kufel: *Analiza… op.cit.*, b. 62 based on: Ö. Sölvell: *Clusters – Balancing Evolutionary and Constructive Forces.* Ivory Tower, Sztokholm 2009.

To the projects having a significant impact within this scope belonged the fillowing:[146]

- the action 2.6 ZPORR (Regional innovation strategies and transfer of knowledge),
- the action 2.3 SPO RZL (Development of modern economy personnel),
- the action 1.3 (Creation of favourable conditions for development of companies),
- the action 1.4 SPO WKP (Strengthening the cooperation between the research and development sphere and the economy).

In the next period of programming a greater emphasis was put on the elements that determine the functioning of clusters. The importance of clustering processes in Poland may be reflected in the fact that in the strategic document *"Kierunki zwiększania innowacyjności gospodarki na lata 2007-2013" (Strategy for increasing innovation of economy for 2007-2013)* there was exposed the importance of the support given to actions of a network character, undertaken by enterprises, whose aim is the realization of undertakings of innovative nature[147].

The possibility of obtaining financing from the structural funds caused that the interest in networking in the form of cluster initiatives in Poland systemati-

[144] Europe Innova, *Cluster Policy in Europe*, A brief Summary of Cluster Policies in 31 European Countries, 2008 – http:// www.europe-innova.eu (access on 05.11.2013).

[145] S. Figiel, D. Kuberska, J. Kufel, *Analiza... op.cit*. p. 62.

[146] J. Staszewska, *Klaster... op.cit*.

[147] K. Kładź, A. M. Kowalski, *Stan rozwoju klastrów w Polsce*, [in:] M.A. Weresa (ed.), *Polska – Raport ... op.cit*.

cally increases. In the perspective 2007-2013 the financial support was provided, inter alia, within the Innovative Economy Operational Programme. In the Priority 5. (Difussion of innovations) there was separated the action 5.1 (Supporting cooperative links of trans-regional importance), for which the implementing institution was PARP *(the Polish Agency for Enterprise Development)*. The action concerned the joint undertakings of groups of entrepreneurs of advice, training and investment nature in the field of creating and managing the organizational structure of the cooperative relation (cluster initiative), preparing plans for the development of relations on the principle of cooperation, joint investments of groups of entrepreneurs and the investments cooperating the entrepreneurs which are necessary for the functioning and development of connecting the actions of marketing cooperative relations[148]. Financing under the Innovative Economy Operational Programme could be obtained only by clusters and cluster initiatives of transregional nature.

A financing option for clusters and cluster initiatives not meeting the condition of being transregional are Regional Operational Programmes (ROP) created in individual provinces based on the specificity of economy of a given area. Another source of fundraising is the Human Capital Operational Programme (HCOP), in which it provided for funding training and advisory services for entrepreneurs within the framework of the action 2.1 (Development of modern economy personnel).

In accordance with the recommendations of the Working Group for the future cluster-based policy contained in the report *Kierunki i założenia polityki klastrowej w Polsce do 2020 (Trends and assumptions of the cluster-based policy in Poland by 2020)* the main objective of the cluster-based policy in the new financial perspective 2014-2020 should be strengthening innovativeness and competitiveness of the Polish economy based on intensification of cooperation, interaction and flows of knowledge within clusters and supporting the development of strategic economic specializations through the national and regional key clusters[149]. The National Key Clusters are the category of clusters of essential importance to the national economy and high international competitiveness. It is recommended that clusters should be selected at the national level, basing on, among other things, the criteria relating to critical mass, developmental and innovative potential, the hitherto existing and planned cooperation and the experience and potential of the coordinator. The Regional Key Clusters are a category of clusters of essential importance to the economy of the region; it is recommended that these clusters should be selected at the regional level based on the criteria set out by the provincial government.

[148] http://poig.parp.gov.pl/index/index/593 (access on 17.02.2015).

[149] *Projekty nowych instrumentów 2014-2020* - http://www.pi.gov.pl/klastry/chapter_95885.asp (access on 18.02.2015).

Recommendations formulated by the Working Group provide two directions of the impact on realization of the cluster-based policy:

— supporting the existing and developing cluster structures through subsidizing the coordinators of clusters (mostly at the regional level);
— integrating the public support around selected clusters of key importance and competitive potential for the economy of the country (national level) and individual regions (regional level), fitting into smart national and regional specializations.

The direct support for clusters in the new financial perspective 2014-2020 is provided for in the following programmes at the national level:

— Intelligent Development Operational Programme (IDOP) within which is assumed concentration of resources on clusters of significant potential for the economic development and competitive on international scale;
— Eastern Poland Development Operational Programme (EPDOP) which is directed to the beneficiaries of five provinces in Eastern Poland, i.e.: Lubelskie, Podkarpackie, Podlaskie, Świętokrzyskie and Warmińsko-Mazurskie.

In turn, at the regional level the direct support for clusters in the new financial perspective 2014-2020 is provided for within 16 Regional Operational Programmes (ROP). Within these programs individual provinces should make prioritization of their development policy by selecting regional key clusters determining or fitting into smart specializations of these regions. At the same time in addition to the existing clusters there should be supported the new economic clusters that manifest initiatives for integration actions. Therefore, at the regional level it is recommended to support the basic tasks of coordinators of clusters within the scope of supporting the animation of processes inside the clusters and the development of joint strategies of action.

As shown by the research results of the OECD, the enterprises operating in cluster structures implement innovations four times more often than the entities operating outside them[150]. Clusters in Poland start to play a major role in enhancing the competitiveness of economy through building an effective place of cooperation of enterprises, scientific institutions, business environment and administration institutions. The development of clusters, which have been repeatedly emphasized, contributes, among other things, to faster economic growth, higher productivity of enterprises, inflow of direct investments, increase of export and creation of new jobs. Therefore, the EU funds in the years 2014-2020 will mainly focus on all initiatives aimed at the creation and development of cluster structures. Therefore, it becomes important for the originators and leaders to, as soon as possible, begin works on the development of strategies of such actions, which will ensure effective obtaining of the EU support for their implementation.

[150] P. Szarubka, *Dotacje na klastering 2014-2020* - http://info.mergeto.pl/2014/10/dotacje-na-klastering-2014-2020/ (access on 18.02.2015).

3.3.3. Opportunities for developing cluster initiatives in the agri-food sector

Poland is a country where due to conducted policy aimed at increasing competitiveness and innovation there is observed establishing of cluster initiatives. These initiatives derive patterns from the European examples of such activities in practice. In the context of regional and economic policy in a number of European countries there was successfully implemented the theory of clusters, and the experience acquired within the framework of the carried-out activities can help in targeting the efforts of the Polish entities to enter into agreements in the form of cluster initiatives.

Identification of structures of the character of cluster initiatives in the case of Poland is a difficult, complex and time-consuming process. Due to the lack of uniform legal regulations and relatively short history of the institutions of this type, in the Polish conditions there does not function any system of their registration, and the identification is usually reduced to carrying out an online query. The results obtained from the use of this method do not guarantee, however, obtaining a comprehensive set of results. Cichoń and Figiel, using an online query, separated 54 cluster initiatives functioning in Poland[151]. In addition, the authors pointed to a certain relation that occurs between the degree of economic development of a province and the number of actively operating cluster initiatives. In provinces with low levels of GDP per capita there could be observed relatively more cluster initiatives than in the most developed provinces. Other authors, in the research conducted a year later, made a list of 106 actions and projects which to some extent correspond with the definition of the concept of cluster initiative generally accepted in literature[152].

It is worth stressing here that, depending on the country or region, there can dominate different models of initiating the cooperation network that then affect the structure, goals and operation of a given organization. In practice, actually, one can talk about three basic categories of the formation of cooperation networks and clusters, i.e. grassroots cooperation networks, exogenous cooperation networks and endogenous cooperation networks. Grassroots cooperation networks (based on *bottom-up*) are formed generally as associations of enterprises, especially SMEs, aimed at specified economic benefits. These entities already have partners with whom they have been conducting temporary and permanent cooperation for many years, however, these contacts should be structured and developed within the network. Due to many-year cooperation, the network usually has a strong, stable position and has a balanced structure of relations. Such networks are characterized by intense, decentralized cooperation of individual participants who act on equal terms, setting priorities and areas of activity. The key aims of

[151] J. Cichoń, S. Figiel, *Konkurencyjność polskiej gospodarki a rozwój klastrów* [in:] J. Kotowicz-Jawor (ed.), *GOW – wyzwanie dla Polski*, PTE, 2009, pp. 193-206.

[152] K. Kładź, A. M. Kowalski, *Stan rozwoju klastrów w Polsce*, [in:] M.A. Weresa (ed.), *Polska – Raport ... op.cit*.

the cooperation networks are networking activities, exchange of experience, joint work on the development of technology and winning new markets[153].

The initiators of exogenous cooperation networks (based on *top-down*) can be both institutions promoting economic development in the region, as well as individual federal states or government institutions. The networks that were formed in this way are unable to secure independent financing in the early stages of development. The initiators of such networks also in the beginning transfer the responsibility for managing them to the institutions of trust specified by them (economic development agencies, project management institution, etc.). The above-mentioned organizations are generally not members of the network, but manage it from the outside, and the instrument for this is often the so called "inner group" which identifies the individual areas of activity[154].

Network structures, in the center of which there is one main member or several members, are called endogenous cooperation networks of the *top-down* type. Typically, such an actor is a university, possibly scientific and research unit, which, being the initiator of the project, also deals with the management of the network using its own personnel. The necessary funds are generally provided by the main actor of the network or within the framework of R&D projects jointly realized by all members. Membership in such a network often is not of a binding character and has a predetermined time horizon, for example, depending on the duration of project. The characterized networks do not usually have their own legal form, which distinguishes them from the previously described networks which in most cases exist as registered associations[155]. Based on the above categories, it is worth noting that in Poland a significant motivation for establishing agreements in the form of cluster initiatives is the possibility of obtaining financing from the EU funds dedicated to the activity of cooperative nature.

An important issue in terms of opportunities for developing cluster initiatives are the directions of innovative actions in the food industry. Creating and perfecting solutions which are innovations for the entities implementing them should be an immanent feature of any organization functioning in the market. In the case of enterprises, as already mentioned, this is one of the important elements stimulate their development and influencing the market position and ability to compete, also in the supranational dimension. Although the price is still one of the most important tools used to achieve such purposes, the entrepreneurs more and more often recognize the role of such non-price instruments of competition as the quality and novelty. The need for implementing innovations also results from the specificicity of the food products market which is relatively saturated, moreover, it is character-

[153] G. M. zu Köcker, L. Garnatz, *Klastry jako instrumenty inicjujące prace badawczo-rozwojowe między Niemcami a Koreą*, PARP, Warszawa 2012, p. 19.

[154] *Ibidem*, p. 20.

[155] *Ibidem*, p. 20.

ized by very strong competition. One of the more recent initiatives on innovative solutions for food and nutrition is the creation in 2014 of new cross-border innovation centres (the so called knowledge and innovation communities - KICs)[156]. They focus, among other things, on innovations for healthy living and active aging and on prospective food (i.e. a sustainable food supply chain "from farm to fork")[157]. The above initiatives are expected to contribute to the achievement of the objectives adopted in the strategy "Europe 2020".

Innovative solutions for companies in the food industry are concentrated, as it turns out, on several main directions of production: fresh food, food chemistry, food additives and food components, and processed food[158]. Fresh products, offered in the natural form, are perceived as better, healthier, more valuable than those which were made in production processes connected with the processing of raw materials. In this connection, the actions of companies consist in preseving these features as long as possible – prolonging freshness period while maintaining good appearance of the products, taste and nutrients. As it is emphasized by A. Baruk, a very important activity of entities is connected with reaching the consumers' awareness and preserving in it both the presence of the company and the products offered by it[159]. This in turn means the necessity of formulating a message which will appeal to the buyers and which will trigger a positive result in the form of a purchase of this company's products, not competitors'. R. Winger and G. Wall estimate that the appropriate marketing actions are one of the most important factors in the success of new products in the market[160].

A specific and notable example of innovative solutions in the food industry is functional food. This is the so called discipline with prospects because it is food from which there were removed components with the potential negative impact on health (e.g. allergens) or which was enriched with physiologically active substances – to obtain a product with adequate nutritional value, improving the human condition[161]. The effect of these actions are e.g. high-protein, high-cellulose, low-energy,

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[156] B. Grzybowska, *Innowacyjność przemysłu spożywczego w Polsce – ujęcie regionalne*, Wyd. Uniwersytetu Warmińsko-Mazurskiego w Olsztynie, Olsztyn 2012, pp. 128-130.

[157] *Wspólnota wiedzy i innowacji* - http://ec.europa.eu/polska/news/111130_innowacja_pl.htm (access on 18.02.2015.).

[158] Cf. M. Prosińska, *Innowacje w sektorze spożywczym*, Roczniki Naukowe Stowarzyszenia Ekonomistów Rolnictwa i Agrobiznesu SERiA, tom 8, zeszyt 2, 2006.

[159] Cf. A. Baruk, *Nabywcy finalni jako podmioty marketingowego oddziaływania*, „Dom Organizatora", Toruń 2008.

[160] Cf. R. Winger, G. Wall, *Food product innovation. A background paper*, Food and Agriculture Organization of the United Nations, Rome 2006; R. Chorób, *Działania marketingowe w rozwoju innowacyjnych form powiązań integracyjnych w agrobiznesie* [in:] M. Gębarowski, L. Witek, B. Zatwarnicka-Madura (ed.), *Marketing-aktualne problemy i kierunki ewolucji*, Oficyna Wydawnicza Politechniki Rzeszowskiej, Rzeszów 2012, pp. 39-48.

[161] Cf. *Żywność wygodna i żywność funkcjonalna,* F. Świderski (ed.), Wyd. WNT, Warszawa 2003; *Żywność prozdrowotna: składniki i technologia*, J. Czapski, D. Górecka (ed.), Wyd. Uniwer-

low-cholesterol products. The innovative offer of food producers also includes products designed for the specific needs of the body. They are targeted at specific groups of consumers, e.g. diabetics, people with food intolerance, circulatory disorders, as well as athletes, people living under stress, pregnant women, infants, children, elderly people. They are to support the proper functioning of the body, minimize the risk of certain diseases, improve psychomotor condition, increase efficiency, etc. It is best if it is done under the influence of natural ingredients and not artificially generated substances[162].

It is worth noting that innovations in the food industry are not only new products, although from the point of view of the purchaser they are the most important. The manufacture of new products is accompanied by new technology solutions – process innovations. The investment activity of the Polish food industry has already been focused for many years on the modernization and replacement of production equipment, the effect of which is that now it belongs to the most modern in Europe. Technologies should also keep up with market trends prevailing in the food market, and even overtake them. The mentioned customers' expectations regarding the natural, least-processed food are a challenge for manufacturers since they need to seek appropriate methods of its preservation. The traditional methods (e.g. pasteurization, high temperature, sterilization, use of chemical preservatives) are replaced by, for example, high hydrostatic pressure, pulsed electric field or ionizing radiation[163]. Examples of innovative solutions are also nanocapsulation and nanoemulsification of pro-health food ingredients ensuring their durability and precise delivery to the body or the use of nanobiosensors and nanofilters for monitoring the course of technological processes, food quality and safety together with the assessment of the impact on the human body[164]. It should be emphasized that the presented directions of innovative actions carried out by the enterprises in the food industry under the influence of trends prevailing in the food market certainly do not exhaust the issue of innovative solutions applied in this industry.

To sum up this part of the discussion, it should be concluded that the industry profile of the Polish cluster initiatives is diverse[165]. These initiatives are focused on both manufacturing activity as well as services. A clear and noticeable trend is the creation of cluster initiatives by entities representing activity of innovative nature

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sytetu Przyrodniczego, Poznań 2014; A. Kraus, *Projektowanie i rozwój nowych produktów w oparciu o innowacyjne metody i techniki badania konsumentów*, Wyd. Uniwersytetu Rzeszowskiego, Rzeszów 2012.

[162] B. Grzybowska, *Innowacyjność... op.cit*., pp. 133-134.

[163] A. Bednarek, *Metody utrwalania żywności* - http://biotechnologia.pl/archiwum/metody-utrwalania-zywnosci,1621 (access on 19.02.2015)

[164] Based on *Żywność i żywienie w XXI wieku – wizja rozwoju polskiego sektora spożywczego* - http://zywnoscizywienie.spoleczna.pl/ (access on 20.02.2015).

[165] The review of functioning cluster initiatives and clusters in Poland and, in particular, in Podkarpackie Province will be presented in the next chapter.

or by representatives of biological sciences (*life-science*). It is worth noting that the above trend does not refer only to Poland, but it is also present on the European stage. The interest in the actions corresponding to the nature of cluster initiatives, both in the research and practical spheres, can be considered in the case of Poland, with few exceptions, as the domain of activity of industrial nature[166]. Some authors agree that the biggest barrier to the functioning of clusters and cluster initiatives in Poland, which was emphasized earlier, is still insufficient cooperation occurring between enterprises and scientific and research institutions and other entities supporting them[167]. Moreover, the attitude characterized by reluctance to cooperate seems to refer to all cooperative actions that may occur in all types of market relations, which should be considered a negative trend.

[166] S. Figiel, D. Kuberska, J. Kufel, *Analiza uwarunkowań... op.cit.,* pp. 65-66.

[167] K. Kładź, A. M. Kowalski, *Stan rozwoju klastrów w Polsce*, [in:] M.A. Weresa (ed.), *Polska – Raport ... op.cit*.

CHAPTER IV

STATE AND DETERMINANTS OF DEVELOPMENT OF CLUSTER INITIATIVES IN PODKARPACIE IN THE LIGHT OF RESEARCH

4.1. An overview of the functioning cluster initiatives

Before the characterization of Podkarpackie Province is made in terms of functioning cluster initiatives, this issue should be briefly presented referring to the national conditions. Poland provides favourable conditions for the development of innovation and entrepreneurship. In recent years there has been created in the country a number of business support institutions aimed at supporting the representatives of business and science sectors in the realization of various types of business and research and development ventures. To the economic growth of Poland there also contribute clusters and cluster initiatives, and in recent times there can be seen a large increase in their number in the country[168].

To present the actual number of clusters in the country divided into provinces there can be used the Clusters Map of PARP *(the Polish Agency for Enterprise Development)* which is a source of current, basic information about clusters, obtained directly from their coordinators[169]. It is the database of information about the range of influence of clusters, their foreign cooperation, infrastructural resources held and of information about the number of cluster members, broken down into categories. The *Map* also contains website addresses of individual clusters in the form of links. At the end of the fourth quarter of 2014 on the *Cluster Map* there were 165 clusters operating in the territory of Poland (Fig. 2). The basis for registration of the cluster to the resources of the *Map* was the application from the cluster coordinator[170]. On the basis of the resources of the Map it can be concluded that:[171]

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[168] *Klastry w Polsce. Katalog,* Wyd. I, PARP, Warszawa 2012, pp. 7-8.

[169] *Portal Innowacji: Klastry w Polsce* - http://www.pi.gov.pl/klastry/chapter_95882.asp (access on 21.02.2015).

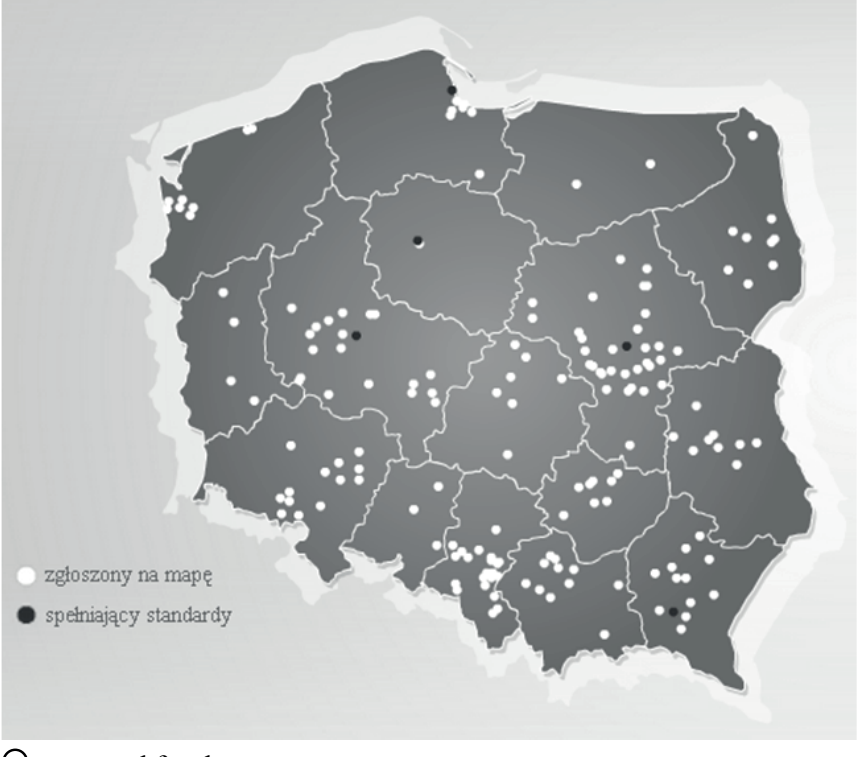
[170] *Clusters Map* is an open base, in the case of interest on the part of coordinators it is them who voluntarily make registration sending an appropriate application.

[171] *Portal Innowacji: Klastry... op.cit*.

— most (31 clusters) are located in Mazowieckie province, and least (1 cluster) in Kujawsko-Pomorskie province;
— most clusters operate in such industries as: IT, ICT and media (20); bioenergy, energy industry, renewable energy sources (18); construction, including green construction (16); medicine, medical services, rehabilitation (14); food industry (10);
— the total number of all cluster members, broken down by types of entities are: entrepreneurs – 4689; scientific units – 516; business environment institutions – 498 and other entities – 1,057;
— clusters declare the joint possession of: research centres – 107; laboratories – 426; conference rooms – 468; training facilities – 509 units;
— the declared range of the impact of clusters is mostly regional – 146 and supra-regional – 134; the global range was declared by 34 cluster coordinators.

Fig. 2.

Cluster Map in Poland



○ proposed for the map

● meeting standards

Source: Portal Innowacji: Interaktywna Mapa Klastrów - http://www.pi.gov.pl/PARP/data/klastry/ (access on 21.02.2015).

It is worth emphasizing that the placement of the cluster on the *Map* is free of charge while the data published on it are the responsibility of the cluster coordinator. PARP *(the Polish Agency for Enterprise Development)* as the owner of the *Map* reserves the right to refuse the registration of a cluster in the event of giving incomplete data or if the entity proposed to be registered does not bear any characteristics of a cluster. Also, in the absence of cyclic updating of the information about the cluster by the coordinator, the entry of the cluster can be removed[172].

According to *Clusters Map*, in Podkarpackie province there function 13 clusters (including 12 proposed to be registered on the map, 1 meeting the standards). The number is confirmed (although the differences may relate to industry of clusters) by the data from Podkarpackie Provincial Office in Rzeszów according to which in Podkarpackie province there function and are supported the following cluster initiatives or clusters germs:[173]

- Aviation Valley,
- Subcarpathian Aviation Cluster,
- Wschodni Klaster Informatyczny,
- Małopolsko-Podkarpacki Klaster Czystej Energii,
- Podkarpacki Renewable Energy Cluster,
- Bieszczadzki Transgraniczny Klaster Turystyczny,
- Health Innovation and Tourism Cluster "Health Resorts of the Pearls of Eastern Poland",
- Organic Food Valley,
- Klaster Przetwórstwa Tworzyw Sztucznych „POLIGEN",
- The Welding Cluster KLASTAL,
- Podkarpacki Klaster Rolno-Spożywczy,
- "Podkarpacie Country" cluster,
- Klaster Podkarpackie Smaki.

In some publications or sources, this list can be yet complemented with such clustered initiatives as: Podkarpacki Klaster Ekologicznej Żywności, Klaster Krośnieńskie Szkło, Innowacyjny Klaster Przemysłowy KOM-CAST, Podkarpacka Platforma Chemiczna, Klaster Meblarski, Stowarzyszenie Winiarzy Podkarpacia, Klaster Dolina Strugu czy Klaster Serwatkowa Kraina[174]. It is worth stressing that not all of the above initiatives fully fit into the definition of a cluster, and not all operate according to the theory of clusters (some may still be of a character of

[172] Because of that there can be some discrepancies between the number of clusters on *Clusters Map* and the actual state (with reference to particular provinces).

[173] *Podkarpacki Urząd Wojewódzki w Rzeszowie* - https://rzeszow.uw.gov.pl/wojewodztwo-podkarpackie/gospodarka/klastry (access on 22.02.2015).

[174] *Portal innowacji: Rzeszowska Dolina Klastrów* - http://www.pi.gov.pl/parp/chapter_86196.asp?soid=4D480A21FFAF4938B5F31D4871DE4278 (access on 22.02.2015); *Klastry* - http://www.pl-ge.com/index.php/pl/2013-05-04-22-18-12/81-podkarpackie-pl/168-klastry (access on 22.02.2015).

good intentions). However, it should be emphasized that the Aviation Valley cluster is the largest cluster in Poland fully fitting into the definition, perfectly functioning and still developing qualitatively and quantitatively, known and respected in Europe and the world, a model of which Podkarpackie and Poland can boast[175]. Due to the undertaken issues of the study concerning mainly the food industry, the further part presents only a brief characterization of cluster initiatives and clusters functioning in the agri-food sector and covering with their activities the area of Podkarpackie Province.

The Organic Food Valley in Lubelszczyzna is the first cluster in the country (established in 2010) bringing together various entities engaged in the promotion and development of organic food. The cluster is of an open character and its structures may be joined by entities and organizations supporting the development of ecological farming and the ecological food production in Eastern Poland (from Lubelskie, Podkarpackie, Świętokrzyskie, Warmińsko-Mazurskie and Podlaskie Provinces). The Strategy of the Organic Food Valley, as its creators declare, will constitute a base for other projects implementing the idea of the Organic Food Valley. The presence of a single farmer in the structure of the Valley is to strengthen its competitive position in the market. The target structure of the Organic Food Valley is a cluster, i.e. a network of cooperating and at the same time competing economic entities, connected with a specific industry, located in the geographical vicinity and supported by local authorities, scientific and research facilities, community institutions and organizations. If as a cluster there will be considered a single producer group in a specific area of agriculture, then the Organic Food Valley will become the "cluster of clusters". Participation in the realization of the project will consist mainly in the intellectual and material-technical support by the participation in the public consultations and the involvement in works related to the creation of the Organic Food Valley[176].

Podkarpacki Klaster Rolno-Spożywczy was created in 2011, when the declaration of accession was signed by 20 companies, and among the signatories to the agreement there were dairy cooperatives and Meat Processing Plant Zakład Mięsny "Smak Górno" (*meat processing plant*)[177]. The majority, however, are companies and producers connected with Leżajsk "Hortino" which deals with fruit processing. The coordination of the cluster was established by the University of Information Technology and Management in Rzeszów. The cluster cooperates closely with the association Stowarzyszenie "AGRO-Karpaty", coordinating its activity, bringing together nearly 50 owners, members of boards and supervisory boards, experts and professionals involved in the development of the agri-food

[175] L. Woźniak, S. Dziedzic, *Funkcjonujące klastry na Podkarpaciu* [in:] W. Szajna (ed.), *Jak stworzyć klaster. Przewodnik*, Wyd. II rozsz., Rzeszów 2011, p. 81.

[176] *Dolina Ekologicznej Żywności* - http://www.dolinaeko.pl/ (access on 22.02.2015).

[177] *Podkarpacki Klaster Rolno-Spożywczy* - http://www.pkrs.pl/ (access on 22.02.2015).

sector in the region. The strategic tasks of the cluster include "creating the market of food products of high health and taste quality" and creating "the identifiable regional brand of products." The aim of the cluster is also promoting the knowledge and supporting the research and development activity of enterprises in the agri-food sector, including farms and processing plants and cooperating companies, the implementation of new innovative methods and technologies in agriculture and processing of agricultural products and the promotion and development of cooperation between enterprises, universities and research and development units. It should be expected that a good example in the form of the created cluster will encourage other entities to make similar decisions, which in the long term will increase the importance of the brand in promoting the region and will bring local and regional development[178].

The cluster *Podkarpackie Smaki* created in 2013 is one of the actions within the project "Alpine-Carpathian Cooperation Bridge" bringing together, among others, producers of food based on two major criteria: quality and tradition[179]. Its activity is coordinated by the Association for Development and Promotion of Podkarpacie "Pro Carpathia" whose aim is to promote traditional, regional and ecological food produced in the area of Podkarpackie province. This aim is being realized in many ways, including disseminating knowledge about regional products, persuading consumers to them, as well as cultivating local traditions and customs. Enterprises, research organizations, business environment institutions, public and private universities, public institutions and other interested entities can become members of the cluster "Podkarpackie Smaki". The cluster currently has 36 members. The operation of this cluster also improves the image of Podkarpacie as a region attractive to tourists and having its own specificity. It is worth noting here that in the census of the Ministry of Agriculture there are already listed 180 Subcarpathian traditional dishes and products (see Fig. 3), which gives Podkarpackie province the first place, right behind it there are the following provinces: Pomorskie (160), Małopolskie (139), Śląskie (137) and Lubelskie (134) (134)[180]. Shaping the local product creates an opportunity to improve the economic situation in the region, while providing positive environmental and social effects. It is thus the regional way for the realization of, now strongly emphasized, balanced development[181].

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[178] The cluster currently has around 90 entities from South-Eastern Poland, including farms, producer groups, enterprises in agri-food industry, commercial companies and industry-related companies.

[179] *Podkarpackie Smaki* - http://www.podkarpackiesmaki.pl/ (access on 22.02.2015).

[180] *Lista produktów tradycyjnych* - http://www.minrol.gov.pl/Jakosc-zywnosci/Produkty-regionalne-i-tradycyjne/Lista-produktow-tradycyjnych (access: 22.02.2015).

[181] R. Chorób, *Wpływ produktu regionalnego na rozwój innowacyjnych struktur integracyjnych w agrobiznesie* [in:] A. Kasprzyk, P. Maciaszczyk (ed.), *Turystyka i rekreacja a przedsiębiorczość*, PWSZ w Tarnobrzegu, Tarnobrzeg 2013, pp. 107-116.

Fig. 3.

Statement of traditional products in provinces

Source: *Lista produktów tradycyjnych* - http://www.minrol.gov.pl/Jakosc-zywnosci/Produkty-regionalne-i-tradycyjne/Lista-produktow-tradycyjnych (access: 22.02.2015).

The association *Stowarzyszenie Winiarzy Podkarpacia* was founded in 2006 by participants of the training conducted under the program "Podkarpackie winnice" (*Subcarpathian vineyards*)[182]. The main task is to support the winemaking activity of its members and dissemination of knowledge in this field. Among the specific objectives there should be mentioned substantial and organizational support for farms, producer groups and other persons and institutions interested in professional viticulture and production of grape wines; promotion of national grape wines, popularizing broadly defined culture of wine, particularly the Polish winemaking traditions; maintenance and popularization of regional recipes and processes of wine production; cultivation of the tradition of making alcoholic beverages at home; promotion and popularization of tourism and sightseeing; providing favourable conditions for professional activity; promoting ecology and protection of animals and natural heritage; actions aiming at protection of tradition and history; supporting the development of local communities[183].

[182] *Stowarzyszenie Winiarzy Podkarpacia* - http://www.winiarzepodkarpacia.pl/ (access on 22.02.2015).

[183] L. Woźniak, S. Dziedzic, *Funkcjonujące... op.cit*., p. 87.

4.2. The scope and methodology of research on agricultural producers and processing units

The identification of the microeconomic determinants of the development of integration relations, including the ones of innovative nature, between agriculture and the food industry was carried out on the basis of representative surveys. The necessity of such a procedure results from the limited availability of statistical materials because reporting as a rule does not cover all aspects of the analyzed economic phenomena.

Determining the factors in the microeconomic level is difficult, sometimes even impossible to carry out. Since some of the data cannot be obtained in any other way than through the survey, it was decided to use just this method. Thus, the subject of the conducted empirical research were the integration relations of agriculture with the food industry in Podkarpackie Province, and the subject of research were the agricultural producers running agricultural activity and obtaining commodity production and the representatives of processing companies operating in the area of Podkarpacie. In particular, the research was to obtain the views of agricultural producers on the possibilities, readiness and willingness to participate in integrated systems. The survey conducted among processing entities aimed at getting to know their views on the factors influencing the establishment and development of integration relations.

The opinion survey of agricultural producers was carried out using the questionnaire and in-depth interview. The interviews were conducted twice: first in 2005 and second in 2013 repeating the tests at the sample of identical size. Repetition of these tests was to demonstrate the evolutionary trends that could arise during this period in the sphere of integration relations of agriculture with the food industry in Podkarpackie Province.

The basic empirical material comes from tests carried out using the technique of standardized questionnaire interview realized both in processing plants as well as in farms of contractors. The choice of this method is supported by the already mentioned fact that some data cannot be obtained in any other way, therefore in this case surveys become necessary. It is understandable that this method has a serious drawback consisting in the fact that it provides intersubjectively unverifiable information[184]. Therefore, the interviews were carried out by people experienced in dealing with farmers, including the author of this study. It can be assumed that such a procedure had a positive impact on the quality of the obtained opinions coming from agricultural producers and representatives of processing companies.

The use of the chosen technique of research is also supported by the functions and advantages of surveys. The survey plays an important role; without it it

[184] S. Stachak, *Wstęp do metodologii nauk ekonomicznych*, AR w Szczecinie, Szczecin 1987, p. 157.

would be difficult (if not impossible at all) to compile many pieces of information received from various people. It fulfills many important functions in data gathering[185]. In the research on the agricultural market the need to use the survey is quite obvious, therefore to carry out the research being the subject of this study there was used the direct questionnaire.

The theoretical bases of the representative method which was used in this study have been repeatedly described in the economic literature[186]. The sample is required to be representative, i.e. to describe with adopted accuracy the structure of the population (be its miniature). The representativeness of the sample is strongly influenced by two factors: the way of sampling and its size. To make the conclusions drawn on the basis of sample surveys be generalized to the overall population, the selected sample should be of random nature. The sample is of random nature when the adopted criterion for the selection of units (elements) is independent of the tested variables and the individual distributions are equal and identical to the distribution of density for the whole community. For the above reasons, it is in practice extremely difficult to ensure complete randomness of taken sample[187].

4.3. The methodology of research on the opinion of entities running farms

As already mentioned, the subject of the conducted surveys were integration links between agriculture and food industry in Podkarpackie Province, and the subject of research were agricultural producers running agricultural activity and at least partly devoting manufactured articles for sale. Therefore, the analysis covered only the farms running commodity production. The main objective of the direct survey addressed to agricultural producers was to determine the range of factors influencing the development of integration relations taking place between the farms of the region and the processing units (a form of vertical integration), as well as between farmers themselves (a form of horizontal integration) or cluster structures. In total the survey covered 500 agricultural producers running farms in

[185] P.N. Hague, P. Jackson, *Badania rynku – zrób to sam*, Wyd. ZNAK-Signum, Kraków 1994, pp. 86-87.

[186] E.g. A.D. Aczel, *Statystyka w zarządzaniu,* PWN, Warszawa 2000, pp. 186-216; J. Bazarnik, T. Grabiński, E. Kąciak, S. Mynarski, A. Sagan, *Badania marketingowe. Metody i oprogramowanie komputerowe,* Canadian Consortium of Management Schools, AE w Krakowie, Warszawa-Kraków 1992, p. 17; S. Brandt, *Analiza danych. Metody statystyczne i obliczeniowe*, PWN, Warszawa 1998; J. Steczkowski, *Metoda reprezentacyjna w badaniach zjawisk ekonomiczno-społecznych,* PWN, Warszawa-Kraków 1995.

[187] S. Brandt, *Analiza... op.cit.,* p. 174; J. Steczkowski, A. Zeliaś, *Metody statystyczne w badaniu zjawisk jakościowych,* AE w Krakowie, Kraków 1997, pp. 107-108.

the area of Podkarpackie Province. When selecting the farming entities there was applied the simple random selection (draw direct) taking into account each of the 21 districts of Podkarpacie. The size of the sample of surveyed agricultural producers is in the range of 200 to 500 households in the case of regional or special research[188]. The size of the sample, both in 2013 and in 2005, is approx. 1% of the total number of individual farms running commodity production in Podkarpacie. It is worth noting here that commodity production was conducted in 2013 by more than 33,3% of all farms (i.e. approx. 57,4 thousand farms), and in 2005 approx. 14,5% of all individual farms (i.e. approx. 45,2 thousand farms)[189].

In table 9, in order to compare and assess the representativeness of the sample, there are presented selected features relating to the farming entities in agriculture, i.e. the percentage of farm managers with higher education and the average area of agricultural land on farm. In the case of the first feature it should be noted that the percentage of farmers with higher education in 2005 was at the similar level, while in 2013 at a higher level. In the case of the second selected feature it should be concluded that the average area of the surveyed farms, in both 2005 and 2013, was more than three times higher than the average area of farms in Podkarpacie. Thus, the analysis concerns farms of above-average areas of agricultural land, which favoures achieving greater commodity production and thus encourages the development of integration relations, both vertical as well as horizontal ones. It seems that only such farms may be permanent partners of food industry units both in the local and trans-local markets. As shown by the data in Table 9, the survey data are not representative for the entire group of individual farms. Due to the random procedure, however, they are representative for commercial farms.

Table 9

The percentage of farm managers with higher education and the average area of farms of the surveyed compared with analogous features describing Podkarpackie Province

Specification	Survey data		Data of Agricultural Censuses	
	2005	2013	2005	2013
percentage of farm managers with higher education (%)	5,0	5,2	5,2 *	2,9 **
average area of farms (ha)	9,6	8,8	2,7	2,9

Source: The author's calculations.

* values for the year 2002 (basing on Agricultural Census for 2002).

** estimates (basing on Agricultural Census for 2010).

[188] Sampling was made on the basis of ways of establishing the size of samples depending on the type of cross tabulation published in the work: S. Sudman, *Applied Sampling*, Orlando Academics Press 1976, p. 87, quoted after: J. Bazarnik, T. Grabiński, E. Kąciak, S. Mynarski, A. Sagan, *Badania... op.cit.*, pp. 13-18.

[189] The author's calculations based on the data of General Farm Censuses of 2002 and 2010.

Making the detailed characterization of the surveyed farmers, in Table 10 are put together such features as average age and education level of the managers of agricultural workshops. As the studies by other authors show[190], it is education and age that belong to basic factors affecting the productive behaviour of farmers in the process of adapting to changes in farming conditions.

Table 10

The average age and education level of the surveyed agricultural producers (in the number of 500 persons) by districts of Podkarpackie Province

Districts	Average age (in years)		Education level (in %)							
			Higher		Secondary		Vocational		Primary	
	2005	2013	2005	2013	2005	2013	2005	2013	2005	2013
Bieszczadzki	46,0	45,9	13,1	9,1	56,5	59,1	30,4	31,8	0,0	0,0
Brzozowski	46,4	46,5	8,3	8,3	37,5	37,5	33,3	29,2	20,9	25,0
Dębicki	44,4	44,1	0,0	0,0	43,5	43,5	43,5	43,5	13,0	13,0
Jarosławski	44,9	44,6	8,3	8,3	50,0	50,0	29,2	29,2	12,5	12,5
Jasielski	45,3	46,3	0,0	0,0	45,8	37,5	50,0	54,2	4,2	8,3
Kolbuszowski	46,1	47,1	0,0	0,0	30,4	34,8	60,9	56,5	8,7	8,7
Krośnieński	48,6	47,3	8,3	8,3	25,0	33,3	58,3	50,0	8,4	8,4
Leski	46,9	46,6	13,0	13,0	34,8	39,2	30,4	26,1	21,8	21,7
Leżajski	43,6	43,4	0,0	0,0	56,0	56,0	32,0	32,0	12,0	12,0
Lubaczowski	48,2	48,3	4,2	4,2	25,0	29,2	62,5	58,3	8,3	8,3
Łańcucki	47,1	46,3	8,7	8,7	65,2	56,5	17,4	26,1	8,7	8,7
Mielecki	48,8	48,5	0,0	0,0	54,2	50,0	41,7	41,7	4,1	8,3
Niżański	46,2	45,4	4,0	3,8	48,0	50,0	28,0	23,1	20,0	23,1
Przemyski	51,9	50,4	8,3	8,7	29,2	30,4	41,7	34,8	20,8	26,1
Przeworski	44,4	44,9	0,0	0,0	64,0	56,0	36,0	36,0	0,0	8,0
Ropczycko-sędzisz.	48,1	48,2	8,7	8,7	47,8	43,5	30,4	34,8	13,1	13,0
Rzeszowski	46,9	45,8	0,0	7,7	64,0	57,7	32,0	30,8	4,0	3,8
Sanocki	45,9	45,9	16,7	16,7	37,5	37,5	41,7	41,7	4,1	4,1
Stalowowolski	48,7	48,3	4,3	4,3	30,4	34,8	30,4	26,1	34,9	34,8
Strzyżowski	41,7	42,4	0,0	0,0	39,1	34,8	39,1	39,1	21,8	26,1
Tarnobrzeski	44,9	45,6	0,0	0,0	50,0	41,7	41,7	45,8	8,3	12,5
On average (in year):	**46,4**	**46,3**	**5,0**	**5,2**	**44,5**	**43,5**	**38,6**	**37,7**	**11,9**	**13,6**

Source: The author's elaboration on the basis of surveys.

Analysing the data in Table 10 it should be concluded that the largest group is made up by farmers with secondary education (average: 44,5% in 2005, 43,5% in 2013 of the total number of respondents), right behind them are farm managers with vocational education (38,6% in 2005, 37,7% in 2013). A much smaller group were farmers with primary education (11,9% in 2005, 13,6% in 2013), and unfortunately the smallest group were agricultural producers with higher education

[190] Np. B. Klepacki, *Wykształcenie jako determinanta zachowań produkcyjnych rolników w okresie przemian gospodarczych w Polsce*, „Zagadnienia Doradztwa Rolniczego" 1997, nr 1, pp. 82-94.

(5,0% in 2005, 5,2% in 2013 of the total number of respondents). A positive trend is the increase in the percentage of farm managers with higher education in 2013 compared to 2005 (the increase by 0,2% points) with a simultaneous decline in the percentage of farmers with secondary or vocational education (similarly, the decline by 1,0% points and 0,9% points). This may prove, different than before, the approach of agricultural producers who associate their education with the level and quality of obtained agricultural production. An unfavorable trend is, however, the increase in the percentage of farmers with primary education (increase by 1,7% points). In more than half of the districts in 2013 there occurred a decrease in average age of farmers compared to 2005, which probably is the result of handing over farm management to younger successors.

The data on the number of people working on the farm (persons above 15 years of age) show that in 2013 on average for one surveyed farm there fell 3,4 persons, while in 2005 - 3,6 persons. A small noticeable decline in the number of people working on the farm probably is the result of the migration of agricultural population in search of alternative jobs and sources of income.

4.4. Characterization of the method of selection of units functioning in the field of food processing

The basic empirical material concerning companies in food industry, as in the case of farms, comes from tests carried out using the technique of standardized questionnaire interview. Many times it is the only possible method to use for collecting information in the field of economic activity in the character of facts and opinions of representatives of processing companies on the needs of developing various integration relations, ratings of conditions for running economic activity and plans for future. In view of the aforesaid restrictions, to make the interviews there were selected persons with experience in contacts with representatives of processing companies, and sometimes the interviews were also conducted in person. It can be assumed that it positively influenced the quality of obtained opinions coming from representatives of enterprises.

The main objective of direct survey addressed to representatives of food industry plants in Podkarpackie Province was to capture the palette of factors affecting the development of integration relations between processing units and agricultural producers in the region (a form of vertical integration on the basis of contracts), as well as affecting the relations between farmers themselves (a form of horizontal integration) and the determinants of development and limitations of expansion of innovative integration structures.

The empirical research was conducted among the leading enterprises in food industry dealing with processing of meat, milk, cereals and fruit and vegetables, operating in the area of Podkarpackie Province. The research using the question-

naire and in-depth interview was conducted at the end of 2014 on the research sample of 200 processing entities which were randomly selected from the group of 382 processing enterprises operating in the area of Podkarpacie (Table 11). In the register KRUPGN – REGON containing enterprises classified according to selected groups of Polska Klasyfikacja Działalności (PKD) *(the Polish Classification of Activities)*, in Podkarpackie Province there were registered 382 economic entities operating in meat, fruit and vegetable, dairy and cereal sectors. The statistical data show that in all analyzed industries the largest percentage is represented by small companies employing up to 9 people.

Table 11

Number of enterprises in the selected sectors of food industry in Podkarpackie Province (status on 31.12.2014)

Activity	PKD*	In total	Percentage (%)	Number of employees							
				0-9		10-49		50-249		>=250	
				Num.	%	Num.	%	Num.	%	Num.	%
Meat processing	**10.11**	**181**	**47,4**	144	79,5	28	15,5	7	3,9	2	1,1
Fruit and vegetable processing	**10.32 10.39**	**86**	**22,5**	76	88,4	5	5,8	3	3,5	2	2,3
Milk processing	**10.51**	**25**	**6,5**	21	84,0	2	8,0	2	8,0	0	0,0
Cereal processing	**10.61**	**90**	**23,6**	88	97,8	2	2,2	0	0,0	0	0,0
	Total	**382**	**100**								

* *the Polish Classification of Activities*

Source: The author's calculations on the basis of the data of the Statistical Office in Rzeszów (status on 31.12.2014).

As mentioned earlier, the surveys covered 200 enterprises. At the selection of the entities there was used the proportional stratified random selection (with the use of a random number generator). Assuming a normal distribution of the examined features (or close to normal) there was selected the sample which is commonly considered in literature to be a large sample (n> 120)[191]. Moreover, it is worth noting that the surveyed enterprises constituted over 52% of the total number of food processing enterprises in Podkarpackie Province (thus every other enterprise was surveyed). An important feature of the applied proportional stratified random selection is also the fact that this selection ensures the distribution of the sample close to the distribution of the whole population.

[191] Cf. J. Jóźwiak, J. Podgórski, *Statystyka od podstaw*, PWE, Warszawa 1992, pp. 155-157; M. Sobczyk, *Statystyka*, PWN, Warszawa 2000, pp. 142-150; M. Sobczyk, *Statystyka – podstawy teoretyczne, przykłady i zadania*, Wyd. UMCS, Lublin 1998, pp. 141-144.

The structure of the drawn entities included in the selected sectors of food processing in Podkarpackie Province in terms of the number of employees is presented in Table 12.

Table 12

The size of the analyzed enterprises in selected sectors of food processing in Podkarpackie Province

Activity	PKD*	In total	Number of employees			
			0-9	10-49	50-249	>=250
Meat processing	**10.11**	**95**	75	15	4	1
Fruit and vegetable processing	**10.32 10.39**	**45**	39	3	2	1
Milk processing	**10.51**	**13**	11	1	1	0
Cereal processing	**10.61**	**47**	46	1	0	0
	Total	**200**				

* *the Polish Classification of Activities*

Source: The author's calculations.

Table 13 presents a more detailed characterization of the surveyed processing companies, taking into account such features as the form of organization, type of activity, appraised value of the company, average number of employees, net revenue from sale of goods, products, services and financial transactions, and average number of suppliers.

Table 13

The characterization of the surveyed processing companies

Specification	2014
Form of organization:	
− one-man business	110
− company	67
− co-operative	23
− state-owned enterprise	0
Type of activity:	
− production	51
− trade	42
− services	68
− production and trade	128
Appraised value of the company (on average in mln PLN):	1,52
Average number of employees:	19,5
Net revenue from sale of goods, products, services and financial transactions:	
− under 27 mln PLN	181
− from 27 to 152 mln PLN	18
− over 152 mln PLN	1
Average number of suppliers:	147,9

Source: The author's elaboration on the basis of surveys.

The data in Table 13 show that from the point of of view of the form of organization the largest group (55%) were one-man businesses and then subsequently companies (33,5%) and co-operatives (11,5%). In the surveyed group there were no state-owned enterprises. In contrast, due to the type of the conducted activity the largest group were production-trade enterprises, although also important were service companies which could simultaneously conduct the previously mentioned activity.

The average appraised value of the company in 2014 remained at 1,52 million zloty. A single surveyed enterprise employed on average approx. 19 people, while the average number of suppliers amounted to approx. 148. This may indicate sourcing raw materials outside the region or delivering larger batches of uniform products through a smaller number of hitherto existing suppliers who thereby satisfied the processing companies' demand for raw materials.

The largest percentage (90,5%) were companies whose average net revenue amounted to 27 million zloty. A much smaller percentage (9%) of the companies earn the average monthly revenue in the range of 27-152 million zloty and the net revenue of over 152 million was obtained by only one enterprise.

4.5. Factors affecting the development of integration links in the opinion of agricultural producers

From the practical point of view the state of advancement and the development of integration links, including relations of innovative nature, are determined by two main groups of factors, i.e. the possibilities and willingness of entities in the agri-food industry to run activity in the system of vertical and horizontal relations and cluster structures. Apart from the limitations related to the real sphere, the interaction of these factors depends on the solutions adopted in the regulation sphere, namely: established legal norms, proprietary relations, pursued economic policy, etc. These solutions define the conditions of trade in the domestic and foreign markets, shape the freedom to choose forms of integration, as well as the selection of appropriate partners of commercial transactions and ways and techniques of farming. Sometimes these factors can actually enforce various forms of integration. Participation in an integrated system is encouraged by numerous expected benefits, of which it has already been written many times before, e.g. guaranty of sale of agricultural produce, which at the same time for the processing sector is the certainty of supply with raw materials for production, increase of competitiveness in the market or possibilities for a more effective organization of economic activity.

The possibility of establishing permanent relations between agricultural producers and food industry and / or cluster structures are determined by the economic condition, stocking of major agricultural products and the situation in

local markets. In the following research the situation in local markets was rated through the opinions on: the possibility to locally process the produced crops, the main recipients of agricultural products, the ways of delivering agricultural raw materials for processing, the distances between purchasing centres and farms, the functioning of purchase centres, identification of competition in the purchase of agricultural produce, the service provided by processing plants and the number and period of concluded contracts. Particular attention, due to the undertaken issues, was paid to the opinion of agricultural producers on the knowledge of the concepts and principles of clustering, the awareness of the benefits of and limitations to the development and the willingness to participate in the existing or initiate new cluster structures.

As indicated earlier, in the are of Podkarpackie Province there dominate farms with small area of agricultural land (average area of agricultural land of the farm is 4,4 ha). The farms producing diverse produce on a small scale, sometimes of poor quality, cannot be credible partners of the entities in food industry. The economic potential of farms in the analyzed area, measured by the ability to increase assets and remain in the increasingly demanding market, is not impressive. However, as follows from the answer to the question about the economic condition of their own farms, the majority of agricultural producers (58,4%) surveyed in 2005 felt that they own farms in average condition, and 32,2% even claimed that their farms are in very good and good economic conditions. Relatively small is the percentage of farms (9,4%) which in the opinion of the owners themselves are in poor or very poor condition. For comparison, the share of farms in 2013, according to the perceived economic condition, was the following: 31,4% - very good and good, 58,6% - average, 10% - poor and very poor. When analyzing these two periods it should be noted that the share of farms in very good and good condition declined for the benefit of farms in average, poor and very poor economic conditions. It is worth emphasizing here that these are subjective assessments and they not always reflect financial and production capabilities of each farm individually. Moreover, as mentioned earlier, there were analysed only the farms running commodity production and thus the expressed opinions are not representative for the whole province.

With regard to the economic condition of farms there was made the analysis of the volume of commodity production obtained by the surveyed farms. Among 500 surveyed farms in Podkarpackie Province in the subjective way there were separated three groups depending on the volume of obtained commodity production. These are farms obtaining commodity production of the value of up to PLN 20 000, from PLN 20 000 to 40 000 and more than PLN 40 000. Table 14 shows the selected information on the resources of production factors in the examined groups of farms.

On the basis of the data presented in Table 14 it should be concluded that the largest group (69,6%) were the farms obtaining the lowest value of commodity pro-

duction, i.e. up to PLN 20 000. There was much less farms in the group of medium and highest value of commodity production.

Table 14

The characterization of selected features of farms and farmers in Podkarpackie Province in 2013

Specification	Selected information on resources of farms by obtained volume of commodity production		
	up to PLN 20 000	from PLN 20 000 to 40 000	over PLN 40 000
Number of farms	348	83	69
Average area of agricultural land (ha)	4,9	8,5	28,1
Farm manager's age	46,6	45,9	45,3
Number of full-time employees for 100 ha of agricultural land	73,3	40,8	12,3
Participation of agricultural education in general education (%)	8,9	10,8	15,9

Source: The author's elaboration based on surveys.

The analysis of examined farms shows that there is a connection between their area and the level of commodity production - along with an increase in the average area of agricultural land the value of commodity production was increased. The data contained in Table 14 also allow observing a clear connection between the value of sold production and the age of farm managers and their agricultural education. The analysis of the data presented in this table shows a positive effect of agricultural education and age of farmers on the advancement of contacts with the market and the level of obtained commodity production. In the group of farms with the highest value of commodity production there were the youngest farmers and at the same time in this group there was noted the highest percentage of farmers with agricultural education.

The analysis of employment, and especially the number of full-time employees on 100 ha of agricultural land showed that it was lower in farms with a higher level of commodity production. It indicates that there is a tendency to the decrease in the number of full-time employees on the unit area with the increase of commodity production. This trend, however, was more connected with enlargement of the area of farms in these groups than the increase in the level of commodity production.

In the group of farms obtaining the lowest value of commodity production were not recorded ones that did not sell their products at all, however, almost every fourth farm (23% of farms) obtained commodity production below PLN 6 000, which allows the conclusion that they produced mainly for their own needs. These farms are therefore to a small extent connected with the market through commodity production or those relations were of secondary importance to them.

The state of advancement of integration links between agriculture and food industry is shown by stocking of important agricultural products. An important element of this integration is the purchase, due to, among other things, its usually institutionalized character. A relatively large part of production goes to further processing by this type of economic activity carried out by large processing plants as well as by small companies from the sphere of agribusiness, constituting the environment for individual farming and often playing the role of local integrator in the producer-farmer's contacts with the sphere of processing and trade. The detailed data on stocking of agricultural products by the surveyed agricultural producers in 2013 are summarized in Table 15.

Table 15

Methods of disposal of major agricultural products of the analyzed farms acc. to market places in Podkarpackie Province in 2013

Specification	Participation of entities in commodity production of farms (in %)			
	Processing plants (on the basis of contracts)	Purchase centres	Private middlemen	Total
Beef livestock	15,6	21,6	62,8	100
Pork livestok	49,3	24,0	26,7	100
Poultry	0,2	0,5	99,3	100
Milk	49,0	42,8	8,2	100
Sugar beet	94,6	2,4	3,0	100
Potatoes	3,5	62,6	33,9	100
Oilseed rape	92,9	0,9	6,2	100
Cereals	60,3	29,5	10,2	100
Vegetables	68,5	16,8	14,7	100
Fruit	43,1	39,2	17,7	100

Source: The author's elaboration on the basis of surveys.

In Podkarpackie Province, on the basis of the data presented in Table 15, the purchase of commodity production of farms by processing plants realized on the basis of contracts is predominant in the case of such agricultural products as sugar beet, oilseed rape, vegetables, cereals, pork livestock, milk and fruit. This demonstrates a high strength of integration relations taking place between the integrator (in this case local processing plants) and agricultural producers willing to conclude agricultural products supply contracts. Answering the question whether farmers are expecting the companies to extend the contract for a further period, 26,2% of them confirmed this possibility, pointing to such arguments as the guaranty of sale of raw materials, advantageous form and long-term cooperation, reliability of the recipient, high quality of delivered material, shares in

the processing company, basic livelihood of the farmer. However, in the case of such products as beef livestock, poultry and potato it is difficult to mention such relations because their sale is carried out primarily through purchasing centres and private middlemen.

Assessing the capabilities of local processing of the crops produced in the farm, in 2013 31,6% (32,2% in 2005) of surveyed farmers expressed the view that they are sufficient; 36,2% (35,4% in 2005) stated that the existing processing plants do not utilize in full the products offered by them; and 49,2% (47% in 2005) of farmers thought that it was necessary to construct new processing plants or to extend and modernize the existing ones. According to 14,8% of farmers (13% in 2005) it is necessary to introduce other forms of stocking of agricultural products, among which they mentioned: the increase of export, reduction of import, sale to scarce trans-regional markets.

The main recipients of commodity production of the surveyed farms in 2013 were purchase centres (70,8%) and processing plants (52,5%). A similar sequence was found in 2005 when purchase centres bought 68%, and processing plants – 49,6% of the products intended for sale. It is worth mentioning here that a large part of agricultural producers offered for sale their own produce both to purchase centres as well as to processing plants. Quite a large group (34,6%) in 2013 were other recipients among which were mentioned middlemen, private buyers and individual consumers (customers) (32% in 2005).

Taking into account the distance between farms and purchase centres it should be noted that the largest group were the farm where the distance from purchase centre was within the ranges - up to 5 km or from 5 to 10 km (more than 69% of households). Nearly 31% of farms were located at the distance of over 10 km from purchase centres. Comparing the year 2013 to 2005, among the surveyed farms there may be found a slight tendency for purchase centres to get closer to farms running commodity production. In turn, pointing to the way of delivering the agricultural produce to purchase centres it should be concluded that the dominant way of delivering produce was farmer's own means of transport – 78,8% of farmers in 2013 provided produce in this way (76,4% in 2005). A much smaller group consisted of farmers who supplied the raw material with the transport at the expense of the recipient (18,4% in 2013, 20,2% in 2005), which shows still low participation in transport costs by the recipients themselves. Quite a large group (on average 9,8%) were farmers who delivered their agricultural produce at their own expense, but using external means of transport. Finally, the smallest group (approx. 2%) were the farmers using, among other things, such methods as direct collection of agricultural produce directly from the farm. Unfortunately, the last form was the least common, and in the opinion of agricultural producers themselves it is the way that should be more developed. This would create a strong indication of creation and development of integration relations with the recipients of these products. These farms are in fact potential contracting parties to establish integration relations –

it can be therefore assumed that in favourable conditions they are also inclined to developing both partial and full integration.

Assessing the hitherto existing forms of purchase – sale of agricultural produce, half of surveyed farmers (in 2013) expressed the view that they fully meet their expectations (50,8% in 2005). The second part of farmers disagreed with that opinion, pointing to the necessary changes in this area, such as collection of produce directly from the farm, expansion/development of the structure of purchase centres, the use of contracts or long-term agreements guaranteeing prices and timely collection of produce, creation of exchanges or agri-food clusters. Responding to the question regarding the presence of competition in the purchase of agricultural products in the studied area, 43,4% in 2013 (44,2% in 2005) of surveyed agricultural producers confirmed its presence, especially in the case of such products as fruit, vegetables, milk, beef livestock, pork livestock and cereals.

Expressing the opinion on the hitherto existing service provided by the processing plants (dairies, meat processing plants, fruit and vegetable processing plants, sugar factories, grain mills, etc.), 8% of surveyed agricultural producers in 2013 rated its level as very good, 30,2% as good, 33% as moderate and 28,8% as poor. In the same assessment in 2005, 10% of surveyed agricultural producers expressed the view that the service is conducted at a very good level; 32,4% of the farmers claimed that it was good; 32,6% believed that it was average and 25% evaluated the level of performed service as bad. Comparing the above assessments it should be noted that in the opinion of the interested parties -agricultural producers the level of broadly understood service provided by local plants is gradually deteriorating – the decline in ratings of very good and good by, on average, approx. 2,1% points. The reason for this may be the current market situation characterized by a surplus supply of agricultural produce, which reflects dissatisfaction of farmers with the conducted policy and activity of these processing companies and discourages cooperation with the above-mentioned entities.

The hitherto existing experience regarding various forms of integration relations, as it was also demonstrated earlier in this study, shows that the majority of agricultural producers tend to give up their organizational independence while maintaining economic and legal autonomy in integration relations. Therefore, the most common form, also in Podkarpackie Province, is contracting.

From among the surveyed farmers, 31,4% in 2013 sold their agricultural products on the basis of at least one supply contract concluded with the processing plant. In turn, in 2005 28,6% of farmers had a supply contract for sale of agricultural produce with at least one processing company. A higher percentage of farmers having a contract in 2013 shows the growing interest in this form of purchase, guaranteeing sale of products at a price specified in the contract. The majority of the above supply contracts were concluded for a period of one year, but there were also frequent contracts for periods of 2 years or 5 years, which favours the development of this form of integration in the long run. The premise for integration pro-

cesses in the long run are in fact the increased benefits from the market exchange brought about by a stronger market position of the integrated system and the possibility to share and reduce technological and economic risks.

The issue concerning the susceptibility of the entities in the agri-food industry to conduct activity in an integrated system refers to the values by which there is assessed the state of advancement of integration links between agricultural producers and food industry. It seems that a particular expression of the discussed tendency are actions to improve the functioning of the farm (e.g. in the form of team activity), observance of contract (e.g. supply contract) by both parties, membership in organizations of farmers, producer groups, benefits in favour of producer groups and the assessment of their functioning and indicating the advisability and legitimacy of creating this type of organization.

Referring to the previously discussed assessment of the economic condition of farms, the surveyed farmers responded to the question whether in their farms there are conducted actions to improve their functioning (e.g. in the form of team activity). Only 10,2% (in 2013) and 11,2% (in 2005) confirmed such plans, pointing to, among other things, such activities as lending agricultural machinery and tools to other farmers, widely understood cooperation with other agricultural producers, creation of breeders' organizations, initiating and participating in courses and training. In support of the above undertakings were mentioned such effects as more effective use of agricultural machinery, improvement of quality and productivity of work, lower costs, increase of the production scale and its profitability. However, the vast majority of farmers did not intend to carry out any actions to improve functioning of their farms justifying it with, among other things, the lack of financial resources, insufficient profitability, lack of interest or consent from neighbours and lack of motivation and prospects for development.

Pointing to the observance of contractual conditions by processing plants, agricultural producers paid attention to the time of payment for the supplied produce – for 42,2% in 2013 (43,6% in 2005) the receivable was paid on the day of purchase of produce, and for 57,6 % in 2013 (56,2% in 2005) the payment for the delivered products followed within the time specified in the supply contract. Answering the question whether the recipient kept to the deadline for payment, as much as 29,8% of farmers in 2013 answered that it was not observed (27,4% in 2005), and for 7,2% of agricultural producers in 2013 the recipient did not fulfil other obligations to the farmers (5,8% in 2005), among which were mentioned the receipt of only part of the delivery or delay in its receipt, lack of the guaranteed price. Worrying is the observed increase in the percentage of farmers for whom there were not kept the terms under supply contracts – surely such treatment will encourage them in future to take similar challenges, which will cause, if appropriate remedial measures in this field are not taken, that poorly developed integration relations in this area will unfortunately with the passage of time become weaker and less frequent.

A significant role in integrating of agricultural producers in rural areas can play different farmers' organizations, membership to which is voluntary. Based on the

conducted surveys it was found that the largest percentage of farmers (on average 52,3%) perceived in their area such organizations as Community Cooperatives and Farmer's Wives' Associations. A slightly smaller percentage of farmers (on average 40,2%) noticed the activity or directly used the services of Agricultural Cooperatives. The least noticed, and therefore less common were, unfortunately, producer groups (teams) and other organizations, among which there were mentioned: Volunteer Fire Department, People's Sports Association, Cooperative Bank, cluster structures. A slight increase in the number and activity was observed in the case of such organizations as producer groups, Farmer's Wives' Associations. These changes are probably a reflection of trends and transformations which took place at that time in rural areas in confrontation with the rules of market economy.

Apart from the existence of the above-mentioned organization in the studied area, important for the development of integration relation is membership in at least one of them. Responding to the question regarding membership in any of the above-mentioned forms of organization, only 16,4% of the surveyed farmers confirmed this fact in 2013 (in 2005, 14% of farmers answered in the affirmative). Thus there occurred slight growing tendency and therefore there can currently be seen more interest of agricultural producers in such type organizations.

Among forms of organization of farmers in the horizontal system are producer groups (teams), membership in which in 2013 was declared by only 4,8% of surveyed agricultural producers (6,6% in 2005). The average number of persons belonging to such a group in 2013 was 193 persons (185 persons in 2005), and the produce supplied with the producer group was usually milk, fruit, vegetables, hops, sugar beets and oilseed rape.

For proper functioning of producer teams essential is the vertical cooperation of these groups with the recipients of agricultural produce, such as processing plants and purchase centres. It is worth noting that the partner-recipient of these products there may also be cluster organizations with which producer groups may establish effective cooperation. Important here become services for "their" producer groups such as providing the initial material, pesticides, veterinary assistance, forms of credit and the means of production. Analyzing the empirical data it should be concluded that in 2013 the recipients of agricultural produce provided: in 15,6% the initial material (12,8% in 2005), in 11,2% plant protection products (9,6% in 2005). in 7,2% veterinary assistance (5,6% in 2005), in 13,2% forms of credit (14,2% in 2005), in 9,2% the means of production (10,4% in 2005). Comparing the two periods there should be noted small changes, which may prove a stable policy conducted by the local processing plants in relation to producer groups cooperating with them, which, on the one hand, can point to clear and unchanging principles for farmers and, on the other hand, the need for cooperation in a wider range.

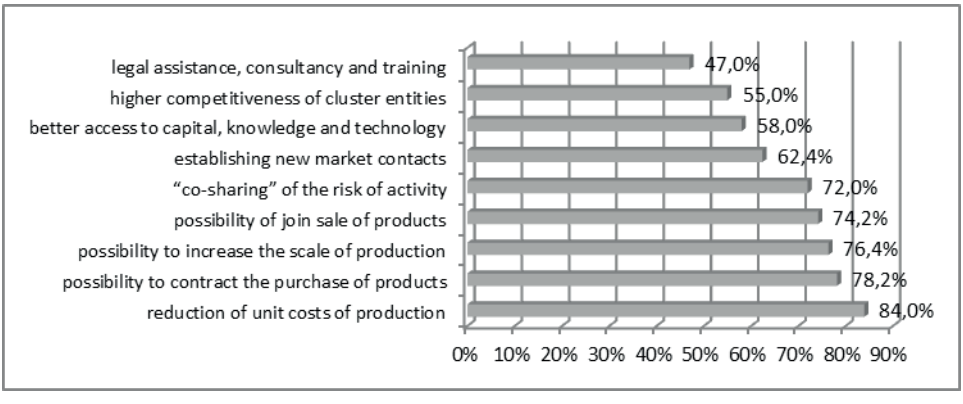
Assessing the functioning of similar producer groups operating in the environment, 5,6% of surveyed agricultural producers in 2013 confirmed that they functioned very well or well, 5,8% rated their activity at a medium level, and 3% as bad or very bad (in 2005: 6,4%, 5%, 3% , respectively). The vast majority pointed to the

absence of any producer groups or cluster structures in the close vicinity, and those that functioned were not positively assessed by farmers, which certainly has a negative impact on the willingness to join one of them. It is worth noting here that in 2013, 29,6% of agricultural producers (28,6% in 2005) felt it was appropriate and advisable to develop such relations, arguing this need with an increase in competitiveness in the market, greater efficiency of the group, a better possibility to sell raw materials and negotiate prices, lower production costs. Quite the opposite view in 2013 was shared by 70,4% of surveyed farmers (71,4% in 2005) who claimed it was not advisable to create such groups due to high fragmentation of farms and therefore low prices of sales of agricultural products. However – J. Wilkin[192] rightly says – the more fragmented and dispersed agricultural producers are, the more developed should be different forms of cooperation between them to strengthen the market position.

A significant issue connected with the tendency of agricultural producers to participate in innovative integration structures is the knowledge of the very concept of clustering. Among the surveyed farmers up to 69% declare that they know the concept and main principles of functioninig of cluster structures. Nearly half of them (45,2%) are able to identify examples of such structures operating in the region or in the country. An extremely important issue are the benefits from functioning of clusters that encourage potential participants to enter into their structures. A list of benefits indicated by the surveyed farmers according to the adopted scale of importance is presented in Fig. 4.

Fig. 4.

Benefits from functioning of clusters encouraging entering into the cluster structure according to the opinion of agricultural producers (acc. to scale of importance)[193]



Source: The author's elaboration on the basis of surveys.

[192] J. Wilkin, *Budowa instytucji wspierających rozwój wsi i rolnictwa w kontekście integracji Polski z Unią Europejską* [in:] *Wieś i rolnictwo. Perspektywy rozwoju,* IERiGŻ, IRWiR PAN, SGH, Warszawa 2002, p. 209.

[193] The data do not sum up to 100% because the respondents could choose a few answers.

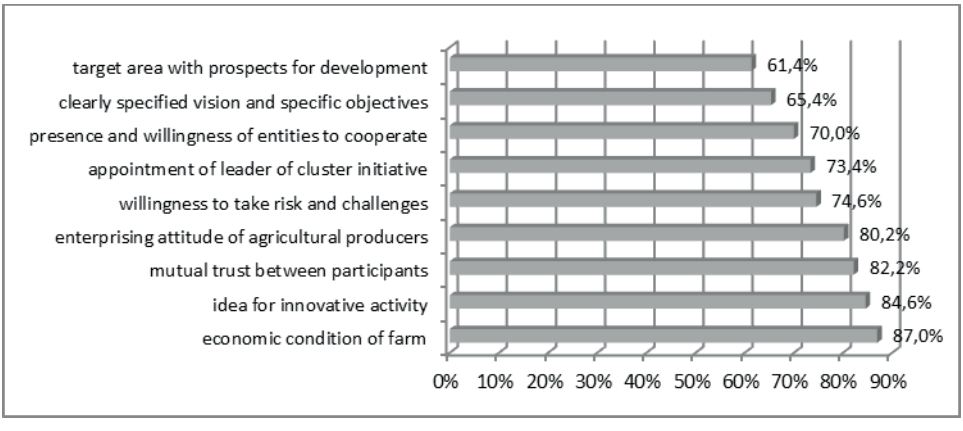
Among the main values (Fig. 4), which encourage agricultural producers to enter into cluster structures were mainly the following: reduction of unit costs of production, the possibility of contracting the purchase of products, the ability to increase the scale of production and joint sale of products and sharing the business risk. Slightly less important there turned out to be: establishing new market contacts, better access to capital, knowledge and technology, higher competitiveness of the cluster entities and legal assistance, counseling and specialized training offer.

Another question the farmers were asked to express their opinion on was the factors which in their opinion influence the creation and development of cluster initiatives. The distribution of answers to this question, taking into account the scale of importance, is shown in Fig. 5.

On the basis of the data presented in Fig. 5 it should be concluded that the main factors determining the initiation and development of cluster initiatives in the opinion of agricultural producers are: economic condition of the farm, the idea for an innovative activity, mutual trust between the participants and entrepreneurial attitude of agricultural producers. This group of factors was particularly strongly emphasized and indicated by respondents. A slightly smaller percentage of agricultural producers pointed to such factors as the willingness to take risk and take on challenges, selecting the leader of the cluster initiative, the presence and willingness of entities to cooperate, clearly defined vision and concretised objectives and the target area having prospects for development.

Fig. 5.

Factors influencing the creation and development of cluster initiatives according to the opinion of agricultural producers (acc. to scale of importance)[194]



Source: The author's elaboration on the basis of surveys.

Not less important for the initiation and expansion of cluster structures are limitations and barriers to the development of this type of innovative relations. The

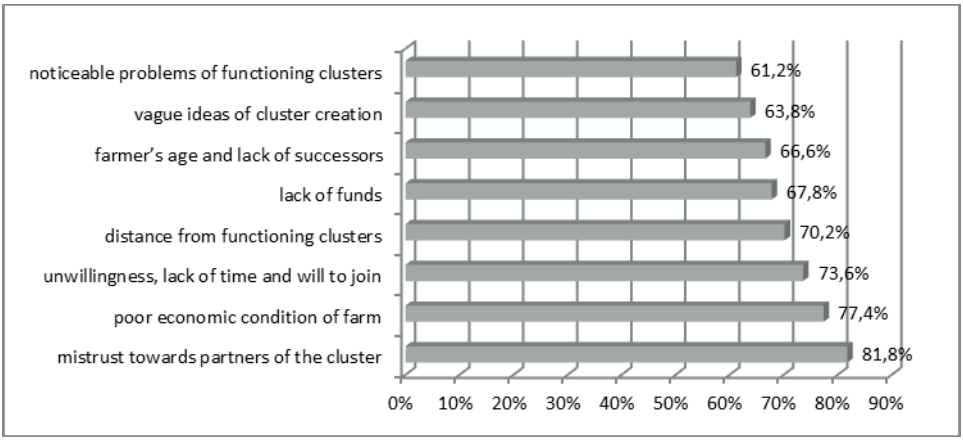
[194] The data do not sum up to 100% because the respondents could choose a few answers.

question of similar content was addressed to agricultural producers who answered it. The distribution of answers to this question, taking into account the scale of importance, is presented in Fig. 6.

The data presented in Fig. 6 shows that main limitations and barriers to entry into cluster structures indicated by the surveyed agricultural producers are the lack of trust in cluster partners, poor economic condition of the farm, prejudice, lack of time and will to entry and the distance from functioning clusters. Special attention, compared to the data presented in Fig. 5, should be paid to two factors: the condition of the farm and the level / lack of trust among partners, which factors, on the one hand, can stimulate the establishment and development of a cluster initiative, and on the other hand, considerably limit these processes.

Fig. 6.

Limitations and barriers to the creation and entry into cluster initiatives according to the opinion of agricultural producers (acc. to scale of importance)[195]



Source: The author's elaboration on the basis of surveys.

When examining the opinions of agricultural producers on innovative integration processes, they were also asked whether, based on the previously expressed views, if they would be willing to join/initiate the creation of a local cluster initiative. This question was answered in the affirmative by 217 respondents (43,4%), while another opinion was expressed by 283 farmers (56,6%) who would not participate in a similar structure.

To sum up this part of discussion which takes into account the opinions of agricultural producers regarding the determinants of expansion of innovative integration relations, there were collected the factors which directly or indirectly influence the development of integration structures and initiatives of innovative nature.

[195] The data do not sum up to 100% because the respondents could choose a few answers.

These determinants are shown in Fig. 7 as the "matrix of factors" influencing the mentioned integration processes.

Fig. 7.

Determinants of the development of integration relations of agriculture with the food industry in the opinion of agricultural producers

The distance between purchase centres and the farm	Main recipients of agricultural products	Identification of competition in the purchase of agricultural raw materials	The level and scope of operation of purchase centres
Entrepreneurial attitude of agricultural producers	The economic condition of the farm	Mutual trust between the participants	The target area having prospects for development
Farmers' willingness to take risk and take on challenges	**Development of integration relations and initiatives of innovative character**		Team activity carried out by agricultural producers
The idea for innovative activity	The appointment of the cluster initiative leader	A clearly defined vision and specific objectives	Membership farmers in various organizations
The method of delivery of agricultural raw materials for processing	The possibilities of local processing of agricultural raw materials	Contracting of agricultural raw materials and products	The level and scope of service provided by processing plants

Source: The author's elaboration

4.6. Determinants and development opportunities of integration structures in the opinion of representatives of processing companies

In this section attention has been focused mainly on determinants and opportunities for the development of integration processes, including cluster structures, indicated by representatives of processing unit. In the case of entities in food processing, participation in an integrated system sometimes forces the associated companies to undertake many resolute and concrete actions. Similarly to the farm, the integrating unit aims at achieving its own objectives which in this case also are of joint nature. To the major goals should be classified the following: improvement of profitability (resulting from the integration annuity), reduction of the cost of raw materials management, risk sharing, achieving high quality of raw materials required by processing technology, the increase of competitiveness and market share by appropriate adjustment of production to the preferences of consumers.

The market conditions that significantly affect not only food industry plants enforce the change of the range of production as well as competition with other units for the recipient of final products. To the question whether in the last two

years the market situation enforced changes in production of enterprises surveyed in 2014, as much as 2/3 of the companies confirmed this behavior. Changes in the range of production in the last two years (decrease or increase) for the majority of companies were at the level of approx. 25%. The development of distribution channels, appropriate from the point of view of efficiency and effectiveness, determines economic and financial conditions of the processing plant. At the same time, high quality of preserves becomes increasingly important in competitive fight. This is conducive to close cooperation of enterprises with agricultural producers or to creation of their own units dealing with production of raw materials. With this process there should be expected a setting up of mechanisms of changes in fragmented agriculture.

The empirical research conducted in Podkarpacie allowed determining the participation of individual suppliers in the supply of the analyzed companies whose size and quality can be circumstances for development of integration links in the province. The largest participation in the supply of the analyzed food processing companies had farmers – 67%, further positions were taken by purchase centres – 13% and other forms of supply – 11%, among which the representatives of companies mentioned: wholesale suppliers, slaughterhouses, cooperatives, their own farm (the so-called self-supply) and other middlemen. The participation of producer groups as suppliers was at the level of 6%, commodity exchanges – 1%, with the use of contracting system – approx. 1%. The lack of producer groups in the vicinity was indicated by 21,5% of the companies, and if such existed, then only 18,5% of processing companies cooperated with the groups. In addition, every fifth company confirmed that in its own structure there functioned a separated department of cooperation with groups of suppliers. This indicates a low degree of advancement of the process of organization of agricultural producers, which, as it may be supposed, does not have a positive influence on the vertical integration of these groups with processing plants.

In 2014 the cooperation with producer groups was conducted by 4% of processing companies which cooperated with six groups, 8,5% with two groups, and 5% only with one group. The average size of group was 17 persons. Among the advantages resulting from cooperation with producer groups were mentioned the systematic delivery of large batches of satisfactory quality raw material, the possibility to negotiate prices, reliable suppliers, patriotism and the preference for local producer groups.

Analyzing the supply phase of surveyed companies it has been shown that in 2014 almost 3/4 of them ensured the completeness, rhythm and appropriate frequency of supplies; 58% shortened the time of acceptance of deliveries to the warehouse; 69% used nearer sources of supply and organized transport on their own; and 82% of companies did not allow the formation of excess and unnecessary stocks.

The factor influencing the initiation of integration relations is the way of gaining new suppliers by enterprises. Representatives of processing companies

pointed to various ways of gaining new suppliers-producers. Among them, in 2014, the following were listed: advertisements – 47%, basing on market research – 12,5%, through the representative-leader of the group of producers – 11% and other methods – 49%, which included: personal or telephone contacts with potential suppliers, personal offers of suppliers,recommendations by other producers, the Internet. An additional premise was the competitive price and the good position of the company in the local environment, which encourages making production and trade contacts.

An important aspect in building integration links is the form of assistance offered by enterprises directed at their suppliers. The highest percentage of surveyed companies provided their suppliers with various forms of credit – 19%. The next places were taken by: means of production – 14%, the initial material – 13,5%, veterinary assistance – 12,5% and pesticides – 6,5%. Among other forms of assistance provided to suppliers the representatives of companies most frequently mentioned: access to cooling devices and cleaning agents, ensuring acceptance of total production, training and expert advice and free testing of produce quality.

Pointing to the importance of the level and quality of delivery services, 91% of companies in 2014 expressed the view that the most important thing for them was the quality of products, for 89,5% of the companies was significant timeliness of deliveries, for 88% - security of deliveries, for 77,5% - the speed in execution of orders, for 73% - the willingness of suppliers to deliver products in an emergency and for 71,5% of companies important was the willingness of the supplier to withdraw damaged (faulty) products and quick replacement of them. Less important turned out to be: the possibility to choose means of transport (37,5%) and willingness to provide maintenance and repair and other services (35%).

A very important issue is the care of companies about the quality of their products, which is confirmed by their answers. As many as 82,5% of the companies strongly confirm commitment to quality of their own products, 15% mainly care about quality within the scope specified by the requirements, and only 2,5% understand the problem and are going to develop a strategy in this regard. Equally important are the reasons why processing companies care about the quality of their products – as many as 46% of entities when taking care of quality in the first place pointed to better satisfaction of customers' requirements, in the second place for 28,5% of companies the reason became avoiding the consequences connected with failure to fulfill sanitary requirements. In 22% of the analyzed companies the focus on quality was used especially in order to be better than the competition. It is optimistic that almost half of the surveyed companies when taking care of the quality of their products have mainly in mind a better satisfaction of the growing expectations of customers.

The dynamics of the process of development of vertical integration relations is slowed down by the poor economic condition of processing companies and, often, their problems with remaining on the market. Food industry plants usually

show extreme caution when going into close relations with farmers because they anticipate considerable difficulties in fulfilling contractually accepted obligations, and in particular the guarantee of the full acceptance of crops from farms and keeping the prices enabling profitability of agricultural production. On the other hand, agricultural producers do not trust the economically weak entities being their potential partners. Lack of trust as well as their fears are justified by numerous suspensions of activity due to bankruptcy of processing enterprises, arrears in payments or non-payment for delivered agricultural produce, resignation from collection of even good quality produce due to lack of financial liquidity. Agricultural producers are concerned, therefore, that such practices of enterprises with which they are not currently bound by any agreement will also apply in the case of signing production contracts connected with the development of more or less close integration relations.

Due to the seasonal nature of agricultural production, in 2014 processing companies took the following actions: only 5,5% of the companies applied storage of total deliveries, 48,5% of the companies applied storage of only the part necessary for production, and periodic deliveries from the farmers were preferred by 32,5% of the companies.

Taking into account the entities incurring costs connected with transport of produce to the processing plant, the representatives of these companies were also asked about the way of delivering agricultural produce. The surveys showed that the dominant way of delivering agricultural produce for processing was transport at the expense of the supplier (approx. 2/3 of the companies). Slightly less common method was the supply of agricultural produce through the transport of the processing plant (56%) or through external transport at the expense of the company (16,5%). Among other ways (2,5%) were mentioned the following: organizing purchase centres and transport by rail at the expense of the recipient. According to representatives of companies the predominance of the method of delivering produce to the processing plant with transport at the supplier's expense does not positively affect the development of integration links but, on the other hand, companies pursuing profit maximization are not willing to participate in the cost of transport of produce to be processed.

One of the elements of fulfillment of contractual conditions by processing companies is keeping to timely payment for delivered crops. Representatives of companies pointed out that for delivered produce – 60,5% of plants in 2014 paid the receivable directly on receipt (purchase) of produce and 57,5% of companies realized payment for delivered products within the time specified in the supply contract. Answering the question whether the representative of company met the deadline for payment, as many as 28,5% of them answered in the negative. In contrast, 6,5% of representatives of processing plants failed to fulfill other obligations to farmers-suppliers, among which were mentioned: collection of only part of delivery, no guaranteed price or delay in collection. There is observed a dis-

turbing high percentage of representatives of processing companies who failed to comply with the conditions resulting from supply contracts – one may believe that such treatment of suppliers of agricultural produce will not encourage them in the future to take steps or initiatives towards creating integration links, and the processing company adopting such practices may face the dilemma of maintaining its own produce base.

Among the internal and external conditionings of the development process of vertical integration of agriculture with food industry, this process is especially influenced by the available resources of technologies in the sphere of food production, qualifications of employees, progress in organization and management with the use of technological and computer knowledge, legal norms, national economic policy, the impact of market mechanism and the rules of international exchange.

State intervention substantially affects the stability and balance of the market at the same time influencing integration processes. Among the instruments supporting integrated entities can be mentioned: credit privileges, not very high fiscal burdens, subsidizing and promoting the technical and technological progress, subsidizing the development of technical and market infrastructure, promotion of entrepreneurship and multifunctional rural development. The synthetic impact of these factors is the accumulation, concentration of capital and an increase in the scale of production. At the macroeconomic level the discussed conditionings stimulate the development of the marketing chain of integration links and the effective development of agribusiness.

Another group of conditionings which are worth noting allows rational running of activity in larger economic structures. This group is the knowledge supported by organization, singled out as the fourth factor of production after land, labour and capital, i.e. the use of various forms of progress: technological, organizational, computer and appropriate management. Knowledge contributes to the development of societies, their economies and the enterprises functioning there, and knowledge resources combined with creativity, efficient innovation processes and the so-called innovative culture are conducive to a measurable growth of their competitiveness[196]. The mentioned conditionings are crucial for the effective development of vertical integration since in the integrated system the complexity of structures, functions, dependencies and regulations is uncomparably greater than in the case of scattered entities. And putting the integration process within the legal framework interprets the rights and obligations of the parties in a broader legislative range, being at the same time the factor verifying the organization and management of the integrated system.

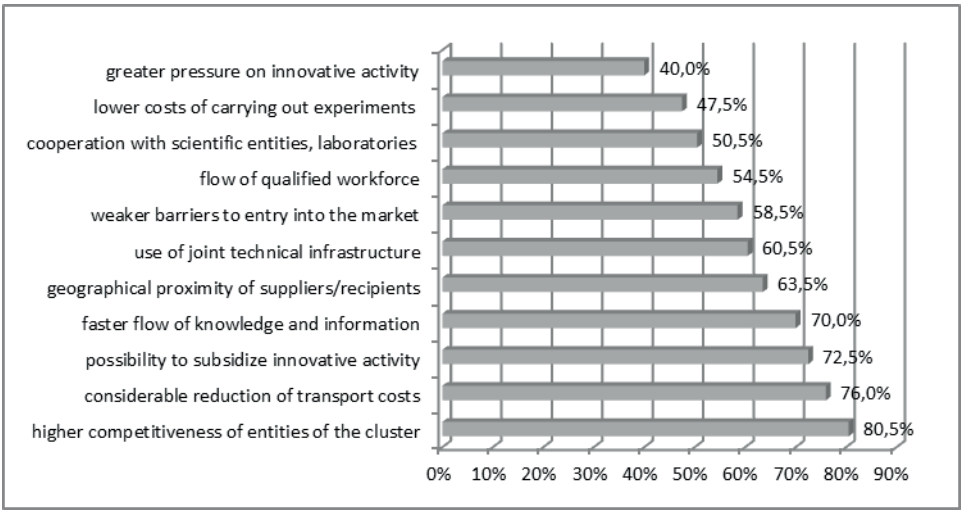
An important issue related to the propensity of processing companies to participate in innovative integration structures is the knowledge of the very idea and

[196] K. Firlej, D. Żmija, *Transfer wiedzy... op.cit*., pp. 8-9.

concept of clustering. Among the surveyed representatives of enterprises as many as 82,5% declare that they know the concept and main principles of functioning of cluster structures. More than half of them (56%) are able to identify examples of such structures operating in the region or in the country. An extremely important issue are the advantages resulting from functioning of clusters which encourage potential participants (individual enterprises) to come into their structure and to derive measurable benefits from this. The list of benefits indicated by the surveyed representatives of processing companies, taking into account the adopted scale of validity, is presented in Fig. 8.

Fig. 8.

The advantages of functioning of clusters encouraging the entry into the cluster structure in the opinion of representatives of processing companies (according to scale of validity)[197]



Source: The author's elaboration on the basis of surveys

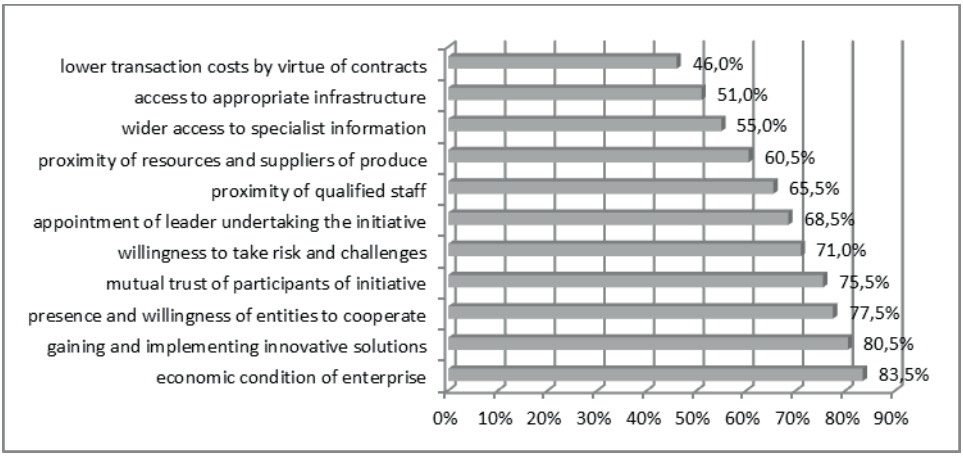
Among the main values (Fig. 8) which encourage the representatives of processing companies to enter into cluster structures were the following: increased competitiveness of cluster entities, a significant reduction in transport costs, the possibility of subsidizing of innovative activity and a faster flow of knowledge and information. Slightly less important turned out to be the geographical proximity of suppliers/customers, the use of common technical infrastructure, lower barriers to entry into the market, the flow of qualified workforce and cooperation with scientific institutions and laboratories connected with the cluster. A smaller part of the respondents also pointed to such benefits as lower costs of conducting experiments and higher pressure on innovation activity.

[197] The data do not sum up to 100% because the respondents could choose a few answers.

Another question that representatives of agri-food processing units were asked concerned factors influencing, in their opinion, the creation and development of cluster initiatives. The distribution of answers to this question, taking into account the scale of importance, is shown in Fig. 9.

Fig. 9.

Factors influencing creation and development of cluster initiatives acc. to representatives of processing companies (acc. to scale of importance)[198]



Source: The author's elaboration on the basis of surveys

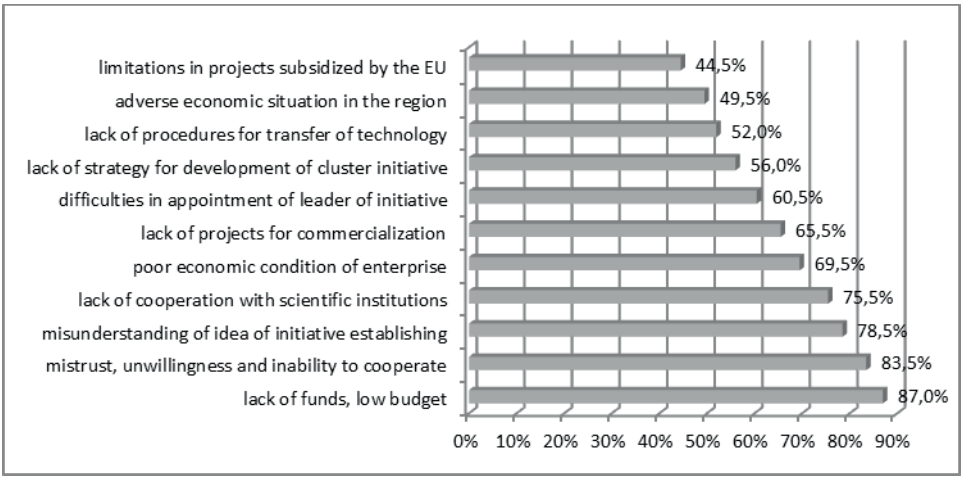
On the basis of the data presented in Fig. 9 it should be concluded that the main factors determining the initiation and development of cluster initiatives in the opinion of representatives of processing plants are economic condition of the enterprise, the acquisition and implementation of innovative solutions, presence and willingness of entities to cooperate and mutual trust between the participants of the initiative. This group of factors was particularly strongly emphasized by the respondents. A slightly smaller percentage of representatives of companies pointed to such factors as the willingness to take risks and take on challenges, the emergence of the leader taking the initiative, the proximity of qualified personnel, proximity to resources and suppliers of produce/commodity and a wider access to specialized information. Factors that turned out to be the least important were the availability of appropriate infrastructure and lower costs due to supply contracts.

Not less important for the initiation and expansion of cluster structures are limitations and barriers to the development of this type of innovative links. The question of similar content was addressed to representatives of processing units. The distribution of answers to this question, taking into account the scale of importance, is presented in Fig. 10.

[198] The data do not sum up to 100% because the respondents could choose a few answers.

Fig. 10.

Limitations and barriers to creation and entry into cluster initiatives acc. to representatives of processing companies (acc. to scale of importance)[199]



Source: The author's elaboration on the basis of surveys

The data presented in Fig. 10 show that the main limitations and barriers to the entry into cluster structures accordin to the surveyed representatives of processing companies are: the lack of funds and low budget, mistrust, unwillingness and inability to cooperate, misunderstanding the idea of establishing the initiative and lack of cooperation with the scientific community. A slightly smaller percentage of representatives of companies pointed to such barriers as poor economic condition of the enterprise, lack of projects for commercialization, difficulties with selecting the leader of the initiative, lack of development strategy for the cluster initiative and lack of procedures for technology transfer. Limitations that turned out to be the least important were: unfavorable economic situation in the region and limitations in projects subsidized from the EU funds.

Special attention, in comparison to the data presented in Fig. 9, should be paid to two factors: the level of trust between the entities and their willingness to cooperate, and economic condition of the enterprise, the factors which, on the one hand, may stimulate the establishment and development of cluster initiative, on the other – be a serious limitation and significantly delay these processes.

When examining the opinions of representatives of agri-food processing units in relation to innovative integration processes, they were also asked whether, based on the previously expressed views, they would be willing to join/initiate the creation of a local cluster initiative. To such a question affirmatively answered 64 respondents (32%), while of a different opinion were 136 rep-

[199] The data do not sum up to 100% because the respondents could choose a few answers.

resentatives of companies (68%) who would not join or undertake the creation of a similar structure.

To sum up this part of discussion, taking into account the opinions of representatives of companies regarding the determinants of development of innovative integration links, there were collected the factors that directly or indirectly affect the expansion of the integration structures and initiatives of innovative nature. These determinants are shown in Fig. 11 in the form of "matrix of factors" affecting the mentioned integration processes.

Taking into account the factors determining the establishment and development of integration links, also of innovative nature, it should be noted that both the surveyed agricultural producers as well as representatives of processing companies pointed to similar determinants. Among them should be mentioned the following: economic condition of the farm / enterprise, the idea and implementation of innovative solutions, the level of trust between participants, willingness to take risks and actions and the selection of leader of cluster initiative. This may indicate a similar view of both parties on the integration processes, and the common denominator, with mutual understanding and undertaken cooperation, may be a prerequisite for establishment and development of cluster structures in the region.

Fig. 11.

Factors affecting development of integration links between agriculture and food industry according to representatives of processing companies

Seasonality of agricultural production	Major suppliers of agricultural produce	The distance from sources of supply	Forms of gaining new suppliers
Time of acceptance of deliveries to the warehouse	The method of providing agricultural raw materials	Organization of own transport	Forms of assistance and support for suppliers
Managing stocks in warehouse	Completeness, rhythmicity and frequency of deliveries	The quality of agricultural produce for processing	Presence and cooperation with producer groups
Willingness to take risks and challenges	**The expansion of integration links and initiatives of innovative nature**		Timeliness in meeting obligations
The level of mutual trust between participants in the initiative	Presence and willingness of entities to cooperate	The economic condition of the enterprise	Willingness to establish integration links
Proximity of qualified staff	Appointment of the leader of cluster initiative	The quality of offered manufactures and products	Presence of competition in the processing industry
Wider access to specialized information	Availability of adequate infrastructure	Lower transaction costs due to supply contracts	Transfer of knowledge and diffusion of innovations

Source: The author's elaboration

Representatives of entities in food industry, as well as other authors[200] point to numerous advantages of the food industry sector which plays an important role in balancing of the economic and social development of regions. Its activation seems particularly justified in the areas traditionally connected with agricultural activity (regions of raw materials), regions characterized by high unemployment rate where with the use of small financial outlays there are opportunities to train employees to perform relatively simple manual works in food processing plants. Creating such enterprises is connected with generation of new jobs in occupations directly related to the agricultural environment. Thereby the sector contributes to reduction of unemployment, formation of the class of small property owners and the consequent change in the social and professional structure of regions, especially rural areas and small towns. The enterprises operating in food processing are also conducive to the creation of vertical and horizontal integration and cooperation links, and thereby the creation of human relationships and consolidation of local communities. Due to close integration links between the processor and the agricultural producer it is possible to provide better quality of the raw material (production for the needs of the processor) and thus the finished product. Permanent links also contribute to greater stability, certainty of purchase and sale of agricultural produce. In turn, the processor, binding to the merchant or sales network, obtains steady and systematic sale of goods and the guarantee of payment.

Measures aiming in consequence at starting-up entities in food processing in rural areas also significantly influence the increase of the level of utilization of the productive potential of agriculture, they also contribute to the stocking of local agricultural raw materials and the resources of farms in the form of buildings, land and sometimes equipment[201]. An important direction is also the expansion of functions of farms and households by food processing and thus increasing their durability and resistance both to the changing natural and production conditions (bad harvests, natural disasters) as well as market perturbations and economic fluctuations.

[200] Np. I. Szczepaniak, M. Wigier, *Małe i średnie przedsiębiorstwa przemysłu spożywczego a zrównoważony rozwój obszarów wiejskich,* Roczniki Naukowe SERiA, Tom II, Zeszyt 3, Zamość 2000, pp. 62-67.

[201] M. Wigier, I. Szczepaniak, *Małe i średnie przedsiębiorstwa przemysłu spożywczego czynnikiem równoważącym rozwój gospodarczy i społeczny regionów* [in:] M.G. Woźniak (ed.) *Nierówności społeczne a wzrost gospodarczy-uwarunkowania ekonomiczne*, Uniwersytet Rzeszowski, Rzeszów 2003, pp. 329-338.

CHAPTER V

DIAGNOSIS OF CONDITIONINGS, RESTRICTIONS AND FORECAST FOR DEVELOPMENT OF CLUSTER STRUCTURES IN PODKARPACIE

5.1. The assessment of state and potential for development of cluster initiatives

Podkarpacie in comparison with other provinces is a middle region of the country, both in terms of area and population (5,7% of the country area and 5,5% of the population). The region generates approx. 3,9% of gross domestic product (GDP) and is in the 10th position, but GDP per capita causes it to fall to the last but one place[202]. In Podkarpackie Province the main industry is the low technology industry, i.e. the food processing industry as a potentially least innovative sphere. Through creation of regional policy, innovation policy and creation of cluster structures and local systems of innovation in enterprises there will follow the development of the region. The local system of information, which is a cluster, should provide knowledge about scientific achievements, opportunities to introduce innovations and should assist in capital raising, promotion and marketing[203].

The research[204] conducted by the Institute of Economics at the University of Information Technology and Management in Rzeszów confirmed that in Podkarpackie Province there are clusters of high technology industries that stand out against the background of the country – these are aviation, information technology and industrial automation. Moreover, Podkarpacie is a potential for clusters of mechanical engineering and transport industries, i.e. the automotive industry and rolling stock manufacturers. Among the industries with lower technological advancement there can develop clusters of metal, mineral and plastic products industries as well as wood and furniture and clothing and textiles industries. Due to the nature of the region (large share of agriculture), crucial for the province is

[202] CSO data for 2013 year.

[203] A. Walenia, *Infrastruktura... op.cit*., p. 519.

[204] *Analizy – wspieranie gron przedsiębiorczości na Podkarpaciu,* E. Wojnicka (ed.), Instytut Gospodarki WSIiZ w Rzeszowie, Warszawa-Rzeszów 2006, p. 12.

the cluster of food processing connected with agriculture. Bieszczady districts of Podkarpacie are also a potential for tourist clusters. Identification of factors which may constitute barriers to the establishment and functioning of the food cluster, which were mentioned in the previous chapter, as well as an attempt to indicate elimination of these barriers are an important activity in the process of development of the food cluster. In this process it is important to specify the factors that support clusters, with a particular emphasis on the agri-food sector, consisting mainly in the analysis of the economic environment, competition, assessment of joint actions for developing the institutional environment of the cluster, the creation of a professional offer of services supporting the activity of cluster structures, improving the quality of education and training activity, and the use of sources of financial support from the EU funds[205].

The stage preceding the process of creating a food cluster should be a detailed characterization of the agri-food sector in Podkarpackie, development of the database concerning companies in this industry, their activities and the institutions in the business environment. The following actions are specifying all arguments for creating a food cluster and indicating the measures to be taken to start the process of creating clusters taking into consideration the conditionings of Podkarpackie region. As a factor motivating the process of creation of the food cluster there should be presented experiences in the field of strengthening mutual relations between entrepreneurs of other economic entities (mainly foreign ones) that have been successful in their industry and provide a good example for the creation and efficient functioning of cluster structures[206].

An important stage of studying clusters is the statistical analysis of employment at the local level, distinguishing the specializations of individual territories. The location factor serves this purpose by which there is determined the degree of concentration of employment in a given industry and in a particular place compared to the rest of the country. The location quotient (LQ) is calculated as the ratio of the share of a given industry in employment in a particular region / district to the participation of a given sector in employment in the country. LQ = 1 means that the region has the same share of employment in a given industry, as the national economy. LQ greater than 1,25 indicates regional specialization in a particular sector, which means a potential for creating clusters[207].

Research findings[208] on the analysis of concentration of employment in Podkarpackie Province carried out for industries according to the Polish Classification of Activities of entities employing more than 9 employees, as early as 2010 indicated that in the region of Podkarpacie there might appear industrial clusters of entrepre-

[205] A. Walenia, *Infrastruktura... op.cit.*, p. 520.

[206] *Ibidem*.

[207] T. Brodzicki, S. Szultka, *Koncepcja... op.cit.*

[208] Basing on the data of Central Statistical Office.

neurship, especially the food industry cluster. The above thesis was confirmed by location factors calculated for individual industries (LQ above 1,25) which identified the opportunities to create the following clusters:[209]

- high technology – aviation and industrial automation,
- medium high technology – mechanical engineering, automotive industry and production of rolling stock,
- medium low technology – metal, plastics and mineral industries,
- low technology – food, wood and furniture, clothing and leather industries.

In the region of Podkarpacie among the mentioned identified clusters the greatest potential for functioning and development is with clusters in the following industries:[210]

1. *Aviation* – as a high technology industry – because of the existence of cluster structure in the form of Aviation Valley and the fact that it is a very important specialization of the region on a national scale. Moreover, the support for creation and functioning of Aviation Valley in Podkarpacie was and is one of the priorities of the National Strategy for Regional Development.
2. *Information technology* – as a service and high technology industry, due to the key role of information technology as a catalyst for development of Podkarpacki region which is distant from the main centers of the country's development and has a low level of urbanization. Moreover, as research shows, information technology is the most innovative industry in Poland.
3. *Food Industry* – as a representative of traditional industries and connected with the basic specialization of the region – agriculture. For a successful development of the food cluster it is important to develop agriculture which is a competitive market for food production, particularly the food industry.

It is worth noting that the region of Podkarpacie due to the conditionings may be a natural cluster of ecological production of food. A large area of forests, landscape parks, nature reserves and natural water regions in the vicinity of ecologically clean fields make the area of Podkarpackie Province provide opportunities for production of healthy, uncontaminated agricultural products. In ecological farming no chemicals are used (such as fertilizers or pesticides), which means that no contaminants are brought in the environment. The soil is not being degraded and no harmful substances get to groundwater and rivers. This encourages self-cleaning of the environment and maintaining the biological balance, very beneficial to man and his natural environment.

The reasons to support the development of agri-food cluster in Podkarpackie Province may also be the following:[211]

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[209] A. Walenia, *Infrastruktura... op.cit*., p. 521.

[210] *Ibidem*.

[211] W. Szajna, J. Krupa, *Złożoność procesów tworzenia i rozwoju klastrów w branży rolno-spożywczej w województwie podkarpackim* [in:] W. Szajna (ed.), *Jak stworzyć... op.cit*., p. 142.

— the agricultural character of this region,
— the environment unpolluted by industry,
— sufficient local raw material base for production and processing industries,
— high quality and health safety of raw material and finished product,
— tradition in growing fruit and vegetables,
— adequate level of development of animal husbandry and production of animal materials,
— a large number of small and medium-sized agricultural, fruit-growing and horticultural holdings,
— a significant number of small and medium-sized agri-food processing plants,
— a group of large enterprises in this industry operating in trans-regional markets,
— modern machines and technologies used,
— high level of personnel and implemented quality systems.

Taking into account the examples of food clusters mentioned in subsection 4.1. it seems that the Podkarpacki Agri-Food Cluster can have the widest scope and territorial extent which, in a way, may cover all economic entities in the agri-food sector of the region. It should include first of all the enterprises in the food industry, raw materials and food products processing plants and producers supplying products and raw materials for companies in the agri-food sector. This cluster should also include commercial and service companies engaged in distribution of food products (primarily produced in the region) and providing services to the industry, agricultural advisory centres, units of the business environment, schools and universities educating future employees in the agri-food sector, research and development units, self-government organizations, financial institutions and other organizations engaged in the development of this industry. Taking into account the planned area of operation of the cluster, a wide variety of entities operating in the agri-food sector and the multiplicity, diversity and complexity of problems of the industry, the coordination of the process of creation and development of the cluster seems to be difficult but feasible a task[212].

5.2. The specificity of the agri-food sector and the limits of development

Podkarpackie Province, as it has already been emphasized, has many features that can promote innovative development of individual sectors in the agri-food industry. These include: agricultural traditions and experience in fruit and vegetable crops and breeding, possessed natural resources, modernized machines of enterprises, developed production capacities, implemented quality systems, a large group of specialists and experienced staff managing companies in this industry.

[212] *Ibidem*.

Strengths of the agri-food sector in the region are conducive to improving the quality of production and its growth, implementation of new technologies, creating new products and brand and the development of sales networks.

With regard to the issue of complexity, the widely understood agri-food cluster should cover a broad spectrum of enterprises, institutions and entities. They, among others, may be:[213]

— farms and agricultural cooperatives,
— gardening and fruit-growing holdings,
— stock-farms and breeding organizations,
— small companies producing low-processed agricultural and food products,
— enterprises in the agri-food sector,
— trading companies and wholesalers dealing with selling and marketing of food,
— agricultural advisory centres,
— other organizations and institutions working in favour of rural development,
— regional and local self-government units,
— schools of all levels and universities,
— scientific and research institutes and experimental and research and development centres,
— companies from related industries, suppliers of materials and services to the agri-food sector,
— business support units and organizations,
— financial institutions,
— organizations popularizing a healthy lifestyle and diet,
— suppliers of consulting and training, inspection and testing services,
— the media dealing with the issues of health, local and regional development.

The above list shows a wide variety of entities which can be participants of the cluster initiative in the agri-food sector. The image of the cluster and its activity are primarily shaped by the companies creating it and by various economic entities. An important role is played by local government units, scientific institutions, agricultural advisory centres and business environment institutions. In the activities of the agri-food cluster the entities are represented by the owners of enterprises and the persons who manage them. Due to the nature of the industry, the professional training of owners of farm and companies and of managers is very diverse, and in many cases probably insufficient. To this there can be added cultural factors, the mentality of the environment and a deep mistrust towards making joint ventures. The low level of social capital is sometimes a big obstacle to cooperation. In such conditions, at the initial stage of creating a cluster, the most important task is to build (or rather rebuild) trust among people who should cooperate[214].

[213] *Ibidem*, p. 148.
[214] *Ibidem*.

In addition to the above conditionings, a large number of legal forms and types of ownership of entities participating in the cluster initiative makes also their activity be regulated by a wide range of laws, regulations and other legal norms. For example, only among economic entities there will occur: agricultural, gardening and fruit-growing holdings with specialized departments of agricultural production, agro-tourist and ecological holdings, companies and partnerships, capital companies, cooperatives and enterprises, associations and foundations and other less common forms of economic activity. There is no doubt that in such circumstances there may be a large "discrepancy" in understanding the economic law regulating, for example, the rules of conducting activity on a farm and in a capital company[215].

Levelling limitations and overcoming barriers which result mainly from high complexity of agri-food industry is one of the common tasks of the aforementioned entities forming the cluster initiative. It seems that local government units and business environment institutions have a special role to fulfill in this area.

Although in Podkarpacie there function many economic entities in the agri-food sector operating in the fields of modern technology, most of them, as emphasized earlier, do not have a large enough capital which would enable independent undertaking of innovative actions. These barriers can be mitigated inter alia through making links and cooperation within economic networks. This cooperation may result in obtaining funds not only for creation of the cluster, but primarily for development of infrastructure, implementation of new technologies (information and communication technologies) responsible for effective functioning of the centre of scientific and technical information and the information flow system.

Agriculture in Podkarpackie Province is characterized by a considerable fragmentation. Agricultural production is conducted on small and medium-sized farms using traditional methods of cultivation and animal husbandry. A significant part of production is allocated for family self-suplly, while sale of agri-food articles is often carried out in the open market or through purchase centres. For this reason, prices of produce and agri-food products are highly differentiated and often inflated due to calculation of high margin by middlemen and retailers. As a result, the person most affected by it is the final recipient – the consumer who faces a dilemma of purchasing increasingly expensive and minimally processed food of national origin, or highly processed industrial food coming from import (e.g. under the brand "Made in EU")[216].

There is also noticed not uniform level of preparation of national managers in the trade in raw materials and agri-food articles. This results in unfair trade practices in food trade. The specificity and complexity of functioning of the agri-food sector in Poland, including Podkarpackie Province, is largely due to the mentality of the people and the lack of mutual trust in mutual relations, which was also men-

[215] *Ibidem*, p. 149.

[216] W. Szajna, J. Krupa, *Złożoność... op.cit*., p. 150.

tioned by the surveyed agricultural producers and representatives of processing companies. Certainly it is not conducive to establishing community associations of producers and processors in this industry, e.g. at creating producer groups, associations of producers and processors and other forms of activity, including cluster initiatives. It should be particularly emphasized, however, that despite many limitations and barriers the organizations of the character of economic networks are formed and they do function.

The previously emphasized agricultural production in rural small and medium-sized family farms in Podkarpacie has highly diversified nature, with multidirectional production profile. The production dispersed and diversified in such a way does not provide the sufficient supply base of produce and agri-food articles to supply large processing plants, foreign recipients or large-area retail networks. Pointing to the actions in typically industrial sectors, in the agri-food sector consolidation becomes necessary[217]. It cannot generally proceed by means of capital, both owners of farms and small processing companies will not want to deprive themselves of being a carrier of rights "in their own house". It seems that the only way to change the image of the structure of the agricultural sector in Podkarpackie Province is the creation of a network of economic cooperation – cluster initiatives. The fact is that such actions are not simple to realize. An important issue in this situation, as it seems, remains the matter of creating an organizationally effective economic network with an office, telephone and employed staff – which again creates further (financial) problems related to the realization of such a project.

5.3. The mission, vision and objectives of the functioning cluster initiatives

The industry entities' perception of the initially outlined vision, mission and objectives of functioning of cluster initiatives has been the subject of research by W. Szajna and J. Krupa[218]. The mission of the cluster economic network in the agri-food sector is associated with the integration of activity of economic entities in rural areas within the scope of production, processing, distribution and promotion of high quality food products of unique taste and health values. The mission of the cluster in this industry may thus be the production of food safe for human health, with the use of environmentally friendly methods of production and processing and maintaining the principle of sustainable development of rural areas. The vision of the cluster, according to the respondents, may constitute a well-organized and effectively functioning regional economic network which is capable of taking and realizing the important joint actions of the cluster members for the following:

[217] *Ibidem*, p. 150.
[218] *Ibidem*, p. 156.

1. promotion of a healthy lifestyles and nutrition,
2. development of production of high quality food products of natural health and taste values,
3. sustainable development of enterprises in the agri-food sector and of food producer groups,
4. efficient use of the socio-economic potential of rural areas of Podkarpackie Province,
5. increase of the competitiveness of the cluster members in the region and in the country, as well as in the markets of the European Union,
6. regional development, with an important and in many regions of the province predominant role of the agri-food industry.

Another important issue is the question of ecological farming as well as functioning of ecological farms and companies. According to their owners, cluster initiatives should be developed especially in the area of ecological farming, with consideration of such objectives and tasks as:[219]

— integration of enterprises and employees in the industry,
— implementation of innovative solutions in production and processing of ecological food,
— implementation of new innovative technologies in ecology and environmental protection,
— organization and efficient functioning of the economic network,
— achieving a higher level of utilization of the productive capital,
— promotion of ecological food and organization of joint sales network,
— compliance with the rules of fair competition,
— achieving higher sales and profits by the entities in the industry,
— raising funds for information, educational and promotional actions.

Production and processing of food with ecological methods in the view of respondents should favour socio-economic diversification of rural areas and increase in the quality of life of their inhabitants. It is worth emphasizing that ecological farming is a part of the program for sustainable management of agricultural land and serves the improvement of condition of the natural environment. For these reasons, it should be supported by self-government units and the respective agricultural policy pursued by state institutions.

A big role and significance, as mentioned earlier, is attributed to the regional agri-food cluster which could cover with its operation all economic entities in the agri-food sector in the region. Among the aims and tasks of this cluster (in order to supplement the author's research results presented in the previous chapter) the representatives of the surveyed enterprises mainly mention:[220]

1. the need to react quickly to the changing and increasing needs and preferences of customers in the internal and external markets,

[219] *Ibidem*, p. 156.
[220] *Ibidem*, p. 157.

2. the expansion of the range of offered product,
3. balanced and sustainable regional development and development of cluster members,
4. achieving higher sales and profit,
5. implementation of innovative products,
6. implementation of new technologies and innovative measures,
7. cooperation with scientific institutions and research and development units,
8. achieving a competitive advantage in the market of foodstuffs,
9. cooperation in all areas of economic activity of companies,
10. lobbying on issues relevant to the agri-food sector in the region and in the country,
11. improvement of efficiency of raising funds for investment, information, educational and promotional actions of the cluster and its members,
12. coordinating the activity of the economic network and functioning of the cluster's offices.

This short presentation of the mission, vision and objectives of cluster initiatives in the agri-food sector points to a number of similarities (partial convergence of elements of the vision and mission and certain formulated objectives). The conditionings, specificity and diversity of processes of production of traditional, regional and ecological food influence a considerable difference of initiatives related to ecological farming and production of traditional and regional food products.

5.4. Recommendations and forecast for development of agri-food clusters

Pointing to recommendations concerning the support for development of key agri-food clusters, creating a program to support various forms of cooperation for the needs of agri-food sector the three rules below should be taken into consideration:[221]

1. spending of funds should be focused on the development and practical implementation of innovative projects;
2. allocation of funds should take place on the basis of competitions allowing identification and funding of the most competitive applications for realization of projects, assessed by groups of experts representing the world of science, consulting and business practice;
3. monitoring the realization of projects and the eligibility of spending funds should be based on an assessment of the achievement of well-defined, measurable indicators.

[221] S. Figiel, D. Kuberska, J. Kufel, *Rola klastrów w konkurencyjnym rozwoju sektora rolno-żywnościowego w Polsce*, IERiGŻ, PIB, Warszawa 2013, p. 101.

In the case of agri-food clusters, there should be considered in particular the following issues:[222]

— clusters are a tool, not an aim (a subject) of policy;
— a real (system, not declaration-competition) cooperation of the actors is necessary;
— the current weakness of clusters and their fragmentation (fragmentation of funding) should lead to the promotion of integrating and condolidating actions;
— it is necessary to break the classic sectoral approach to defining the objectives resulting from market needs;
— it is necessary to ensure a continuous process of support and monitoring of changes – preventing inertia.

Creating and developing forms of cooperation allow adapting public policies to the needs of individual enterprises and other actors, as well as to the current situation. Moreover, it contributes to the formation of valuable mechanisms of dialogue and cooperation in strategic areas between different actors (enterprises, universities, public sector, etc.) allowing companies, particularly small and medium-sized ones, to improve competitive capacity because due to strengthening cooperation they are able to overcome the barriers that exist in important areas such as innovation and internationalization. Studies show that if the public sector cannot alone create various forms of cooperation, it can play a very important role in accelerating the processes of their formation. In this regard, what is recommended is openness to requests for support for new forms of cooperation that may arise within grassroots initiatives. Moreover, it is desirable to carry out regular analyses in order to identify potentially existing forms of cooperation. Research and scientific works can serve this purpose and resulting analyses should be also supplemented by opinions of experts[223].

Another challenge is to incorporate the elements of prospective planning in order to better identify potential processes of creation of forms of cooperation, and as a result to exploit the opportunities arising from such phenomena as aging or growing environmental awareness of the society. Finally, the third challenge lies in the relations between the very forms of cooperation which may create new opportunities arising from the combination of knowledge, competence and abilities of two or more forms of cooperation, and it may create new space for development. To key challenges that clusters are currently facing belong internationalization, value creation in networks and the combination of knowledge from different sectors to create innovations at the point of contact of traditional, modern and entirely new sectors based on knowledge[224].

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[222] M. Jabłoński, *Klastry a inteligentne specjalizacje*: http://www.citt.polsl.pl/content/files/Oferty_wspolpracy/listopad/II_Sl_forum_klastrow/Marcin_Jablonski_klastry_a_inteligentne_specjalizacje.pdf (access on 27.03.2015).

[223] S. Figiel, D. Kuberska, J. Kufel, *Rola klastrów... op.cit*., pp. 103-104.

[224] *Ibidem*.

Pointing to the forecast for the development of agri-food clusters in Podkarpacie it should be stated that the province has at least a few advantages that in the near future can positively influence the further development of cluster structures and improvement of the economic situation in this region. The most important qualities, in addition to the previously mentioned, include:[225]

1. *Favourable geographical location*: the province lies on the eastern border of the EU. Through this region there runs an important communication and trading route linking Western Europe to Eastern Europe. This location can stimulate further development of cluster initiatives or lead to a consolidation of the already existing cluster links.
2. *Functioning in the region of special economic zones:* SEZ Euro-Park Mielec and Tarnobrzeg Special Economic Zone Euro-Park Wisłosan. In this connection, crystallization of the subsequent cluster links in the area of Podkarpackie Province should be connected with the development of the SEZ. To the factors that may animate the formation of new clusters of entrepreneurship or encourage the development of already existing structures in the SEZ there belong favourable conditions for running economic activity (including tax reliefs), large consolidation of companies operating in similar industries, developed logistics (including the convenient location and proximity to the major routes), as well as the activity of regional authorities focused on creating the atmosphere of cooperation.
3. *The presence of dynamically operating universities*: Technical University of Rzeszów, University of Rzeszów, University of Information Technology and Management in Rzeszów, which seek areas for cooperation with enterprises and clusters, and also become initiators of some cluster structures in the region, as in the case of the cluster "Poligen" which was created on the initiative of Rzeszów University of Technology, the company Marma Polish Films and the consulting company INNpuls. There are many indications that the universities in Podkarpackie Province will play an increasingly important role in the regional economy not only as institutions educating future specialists but also as promoters of economic life in the region and providers of expert technological assistance to enterprises. In this connection, further intensification of cooperation between science and business should be expected.
4. *Developed metropolitan functions of Rzeszów agglomeration*: Rzeszów and the surrounding area will be the stimulator enhancing economic growth of the entire province. In these areas there should be expected new investments, as the functioning of the Podkarpackie Science and Technology Park should attract companies specializing in creation of innovative solutions. This can be a stimulus for the development of the already existing *high-tech* clusters or

[225] M. Maj, P. Rychlicki, *Kierunki rozwoju Województwa Podkarpackiego w oparciu o klastry*, Openfield, Rzeszów 2011, pp. 63-66.

for creation of new clusters of entrepreneurship. The development of the cluster potential of the region should also be positively affected by the increasing industry specialization of the SEZ.

5. *Podkarpacki research and development sector*: although it does not present itself too favorably currently, there should be expected the improvement of its efficiency through greater financial outlays for its operation, as well as due to the fact that there were recognized correlations between the level of outlays for research and the degree of innovation of regional economies. Clusters will win professional partners within the scope of creating innovations.
6. *Activity of business environment institutions*: they stimulate economic development of the region through, among other things, supporting new economic entities, providing consulting on tax, financial and investment matters, offering training upgrading qualifications of entrepreneurs, as well as engaging in projects concerning the development of economic infrastructure of the province and in the promotion of the entire region.
7. *Presence of companies from the sectors of huge potential in the region*: they can over the next few years use the model of cluster organization and start network cooperation.

To use all possible development opportunities arising both from the strengths of the region and the predominant contemporary trends, special emphasis should be put on the development of clustering in Podkarpacie. The confirmation of this trend is the fact that the clusters of entrepreneurship in Poland, according to research, achieved in the past two years the growth of employment rate at the level of 3,48%, while the rate calculated for Poland amounted to only 1,1%. The advantage of clusters is also the fact that they are much more innovative than the enterprises which are not interested in this kind of cooperation.

5.5. Courses of development of the province based on clusters

When setting the objectives and directions of the development of Podkarpackie province basing on clusters there should be kept in mind the new financial prospect of the European Union for the years 2014-2020. In the new programming period the strategic document, on the basis of which there are and will be established development priorities, is the strategy "Europe 2020". In this connection, when planning the development of clusters of entrepreneurship in Podkarpacie, the objectives should be adapted to this strategy. The strategy "Europe 2020" focuses on 5 key areas:[226]

1. Employment.
2. Research and development and innovations.
3. Climate changes and energy

[226] M. Maj, P. Rychlicki, *Kierunki... op.cit*., p. 80.

4. Education.
5. Poverty and social exclusion.

For each member state there were defined indicators for each of the above-mentioned categories. In the case of Poland there have been identified appropriate indicators which are presented in Table 16.

Table 16

Targets indicators of realization of objectives of the strategy "Europe 2020" for Poland

Objective	The planned level of realization by 2020
Employment	71% of employed persons in relation to all citizens
Research and development and innovations	1,7% of GDP intended for research and development activity and innovations
Climate changes and energy	Limitation of CO_2 emission to 14%. The increase in the share of renewable energy in the whole energy market to 15,48%
Education	45% of society will have higher education
Poverty and social exclusion	The decrease of the number of persons threatened by social exclusion to 1,5 mln persons

Source: The author's elaboration on the basis of the data *"*Cele krajowe strategii Europa 2020*" (Domestic objectives of the strategy Europe 2020).*

In accordance with the assumptions of the strategy "Europe 2020" there should be supported industries that will be developed in the coming financial perspective. The industries of high potential set out in the Regional Innovation Strategy for Podkarpackie Province are identical to the assumptions of the strategy "Europe 2020". These include:[227]

— the industry connected with infrastructure of environment protection,
— the industry of equipment used for obtaining and utilizing renewable sources of energy,
— the industry of natural vegetable medicines and developing centres for their search,
— the industry of natural reusable packagings,
— the industry of modern, biodegradable plastics, modelled on natural solutions,
— ecological agriculture and food industry.

In addition, an important industry which is growing both in Europe and globally is the sector of highly specialized BPO services (*Business Process Outsourcing*[228]). The academic potential of Rzeszów allows starting-up of this type of activity. The activities carried out by companies in the BPO sector are significant undertakings

[227] *Ibidem*.

[228] BPO, i.e. Business Process Outsourcing - is nothing but commissioning to an external entity the management of projects and processes that have been so far realized with the use of internal resources of the company. These processes are of strategic nature for the company, although they do not belong to its core competencies and are not the content of its main business activity.

requiring considerable financial outlays. There is a necessity of involvement of regional authorities to create activity in the BPO sector in the area of Podkarpacie Province. In Table 17 there are presented proposals of purposes by means of which the regional authorities can create an appropriate cluster policy.

Table 17

Proposals of objectives serving the creation of the cluster policy by regional authorities

Strategic objectives	Tools of realization
Creation of support system for clusters	– supporting the development of Business Environment Institutions which will support the development of clusters, – creating the support system for development of clusters at local government unit, – creating special conditions for support for companies in great opportunity industries, – creating the system of exchange of knowledge within the scope of functioning of clusters.
Creation of education and information system within the scope of clusters	– creating an effective system of information on clusters and opportunities for development of a company through clusters, – creating training and advisory mechanisms supporting activity of clusters, – creating training and advisory system for start-ups in great opportunity sectors, – activation of information platform about clusters.
Creation of good investment conditions for development of clusters	– creating attractive investment conditions in particular for high potential industries, – creating a system of financial support for cluster activities, – increasing the access to financing of cluster activities in particular for great opportunity sectors, – creating attractive economic conditions for the development of companies in great opportunity sectors, – directing loan funds to support great opportunity sectors, – creation of units supporting incubation of new companies in great opportunity sectors.
Implementation of effective system of clusters promotion	– realization of actions promoting clusters, – supporting initiatives aimed at promoting clusters and the province, – organization of trade fairs supporting activity of clusters, – organization of events promoting entrepreneurship in the field of great opportunity, – supporting clusters within trans-regional promotion (organization of joint promotional campaigns).

Source: The author's elaboration on the basis of the data *"Cele krajowe strategii Europa 2020"*.

Facing a chance for a noticeable economic development of Podkarpackie Province in the next few years (both by the expected growth in cross-border traffic and development of infrastructure, as well as due to long-term positive social trends), there should be used to the maximum the available financial and organizational

resources for creation and development of cluster initiatives in the region. Functioning of cluster structures can generate positive developmental outcomes, both for enterprises and for the whole region. Activity of clusters can not only attract new investors (which has already been observed in Podkarpacie for several years), but also significantly increase the demand for regional products or manufactures of local enterprises.

The involvement of regional authorities in the support for cluster initiatives is the more necessary and indispensable, the more effects are expected from the carried out economic policy at the regional level. The range of ways to support cluster initiatives by regional authorities is extremely broad. The regional administration in this respect may serve multiple functions: it can inspire entrepreneurs, R&D sector, business support organizations to closer cooperation through promotional actions and making available the necessary infrastructure, it can support the process of raising necessary funds for activity of clusters and create knowledge banks (technical assistance) and it can initiate the formation of new clusters, especially in the areas that are crucial to the identity and development of the region[229].

[229] M. Maj, P. Rychlicki, *Kierunki... op.cit*., p. 83-84.

SUMMARY AND CONCLUSIONS

The transformation of economic system which has been going on since 1989, and is reflected, inter alia, in reduction or elimination of shortages, task directives, soft budget restraints, is a prerequisite for the development of forms of integration qualitatively different from previous ones. The introduction of principles of market economy laid the foundation for the development of various forms of links both between agriculture and the processing industry (a form of vertical integration), as well as between the cooperating agricultural producers (a form of horizontal integration). Insufficient experiences of functioning in the market economy, as well as inadequate market and institutional infrastructure were not conducive, however, to the dynamic development of integration links and caused the state of advancement of these links to be significantly different from that which is characteristic of the food economy of developed countries. Adverse legislative solutions caused the situation that still a significant problem of development of cooperative entities is the need to adapt to the conditions of market competition and the introduction of such organizational solutions which, while ensuring the increase in the economic efficiency of cooperative enterprises, would remain at the same time in accordance with the co-operative principle of democracy, equality and participation of members in management. The knowledge of experiences and models of cooperative development of countries in which for a long time there has been functioning market economy can and ought to constitute for the Polish cooperative organizations the source of models and inspirations in the search for directions of transformations and economic and organizational solutions.

The decision-making motives and the abilities of both agricultural producers as well as entities of the processing industry to adapt to changes occurring in the economic conditions of farming which determine starting and development of cooperation between agriculture and food industry are reflected in the numerical values of coefficients determining the state of advancement of integration links. The estimation of the advancement of integration links was carried out on the basis of the share of contracted production of the surveyed farms in their overall agricultural commodity production and with the use of multiple analytical measures. The assessment of the state and intensity of integration links between agriculture and food industry is primarily an empirical question, and thus it requires making quantification, which makes many methodological difficulties. The methods of quantification should take into account the specific characteristics of the agri-food market and the possibilities of obtaining reliable and comparable figures.

Studies have shown that the entities in food industry and agricultural producers, when entering into integration relations, are more likely to compensate for adverse fluctuations of the market game parameters. The entities participating in the integrated system experience less adverse effects arising from the formation of the price level and volatility of their height. To this fact there contributes both a stronger position of the integrated system in the market, as well as the obligations of the parties to the timely completion of purchase and sale in sizes and time previously agreed, technological and qualitative requirements and loyalty of the entities in the integrated system. This is the confirmation of the thesis that the participation of processing entities and agricultural producers in the integrated system is conducive to offset adverse fluctuations arising from the market economy.

The carried out discussion has also shown that there is a positive dependence between the degree of development of integration links and the level of competitiveness of agriculture and food processing. Although the integration itself is not the main factor for the development of agriculture and food industry, it is, however, an extremely important impulse to accelerate this process. The development of food economy is also determined by technical and economic conditionings, the course of socio-economic processes, especially economic situation, the implemented economic policy and the internal efficiency of farming entities.

Podkarpackie Province in terms of many parameters characterizing the organization of agricultural production, as well as the production potential of the food industry, differs from other regions of the country. It is characterized by significant dispersion of natural and soil conditions and socio-economic structures and the pace of adjustment processes in agribusiness. Agricultural production in Podkarpacie is carried out both on very good and poor soils, in favourable and less favourable climatic conditions, in lowlands, mountains and foothills. The conditioning of farming is also the cleanness of environment, which results from the lack of intrusive industry and relatively modest communications network; in the immediate range of industrial emissions there is only 5% of agricultural land. Natural conditions, as well as the manner of organization of agricultural production may fundamentally and positively affect the competitiveness of regional products. These factors and structural changes in the demand for food as well as pro-ecological reorientation of the Common Agricultural Policy create a condition for development of cluster initiatives, particularly in the area of ecological farming, creating the new face of agribusiness of Podkarpacie.

A significant barrier to the participation of agricultural producers in integration links are the capabilities of quantitative and qualitative responses which are determined by the level of incomes from agricultural production and the environmental conditions. On the other hand the enterprises in food industry reported difficulties connected with obtaining basic produce for production, poor quality of produce and too small single supplies of produce. Failure to adapt the resource base to the needs of the production units demonstrated by the lack of adequate

quantities of high-quality produce of agricultural origin results both from fragmentation of agricultural holdings as well as the specific conditions under which agricultural production is carried out. Due to the lack of own raw material base the entrepreneurs recognize the danger of loss of competitiveness in the local and supra-local markets. Although the advancement of integration links measured by the share of supply contracts is relatively low, it can be concluded, however, based on the conducted research on the benefits resulting from development of vertical integration, that processing plants will dominate in the implementation of various forms of integration links with agricultural producers.

In the face of the above conditionings, one of the important directions of actions is to support the expansion of cluster initiatives in this area which are the best form of development of rural entrepreneurship. By participating in these structures, farms are incorporated into the economy on an equal basis with other market entities. A characteristic feature of clusters is low risk of investment, which should encourage agricultural producers to engage in the undertaking. Furthermore they encourage integration, both horizontal and vertical, having the influence on leaving in rural areas a higher percentage of earned value added. In the case of enterprises in the integrated system, participation in the structure facilitates, among other things, the increase in competitiveness, reduction of costs, transfer of knowledge and diffusion of innovations, and subsidizing of innovative activity.

Although the prospect of participation in the cluster structure provides many advantages for both agricultural producers and processing entities, the development of innovative forms of integration links between agriculture and the food industry is determined by many factors, among which there may be mentioned, among other things, economic and institutional conditionings. The surveys of agricultural producers and representatives of processing companies have also shown that the development of cluster initiatives in Podkarpacie is determined especially by the economic condition of the farm/enterprise, the desire of mutual cooperation, the level of trust between potential participants of the integrated system and misunderstanding of the very idea of establishing initiatives. Despite the fact that in this area there function many economic entities in the agri-food sector, operating in the fields of modern technologies, most of them, as emphasized earlier, do not have a large enough capital to enable independent undertaking of innovative actions. These barriers can be mitigated by, among other things, making networks and cooperation within economic networks. This cooperation may result in obtaining funds not only for creating a cluster, but primarily on the development of infrastructure, implementation of new technologies (information, communication technologies) conditioning functioning of the effective centre of scientific and technical information and the information flow system.

The weakness of integration links is the barrier to functioning and development of the processing industry in the analyzed area. Removing the limitations and overcoming the barriers resulting mainly from high complexity of agri-food

industry is one of joint tasks of the above-mentioned entities forming the cluster initiative. Local government units, agricultural organizations and business environment institutions have a special role to fulfill in this area. The projects undertaken in this area should also ensure the conditions for sustainable development of agriculture by creating favourable conditions for functioning of the entities in the ecological food market and by preservation of ecosystems and their biodiversity. Finally, functioning of cluster structures may generate positive effects for the development of enterprises in agri-food processing industry, farms and other agri-business links, the entire region and in the whole country.

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Opracowanie stanowi bardzo dobre studium różnego rodzaju innowacyjnych powiązań pomiędzy rolnictwem a przemysłem rolno-spożywczym w warunkach dynamicznych zmian rozwojowych, jakie występują w tym względzie. Publikacja dotyczy zatem aktualnych zagadnień o znaczeniu strategicznym. Jest opracowaniem na wysokim poziomie naukowym, charakteryzuje się bardzo dobrą kompozycją merytoryczną i umiejętnie dobranym zbiorem pozycji bibliograficznych. W studium wykorzystano stosunkowo szeroką bazę informacji statystycznych, wyprowadzając logiczne i merytorycznie ważne wnioski. Należy również podkreślić dobry poziom języka angielskiego i staranny edytorski wizerunek publikacji. To, co warto także zaakcentować, to umiejętne przedstawienie dalszych badań w obszarze powiązań występujących w rolnictwie i przemyśle przetwórczym.

Z recenzji prof. zw. dra hab. Stanisława Wydymusa

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