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ANDRZEJ PIOTR WIATRAK

University of Warsaw, Poland

KNOWLEDGE AND INNOVATION MANAGEMENT IN AGRIBUSINESS

Key words: agribusiness, knowledge, innovation, management, development

ABSTRACT. The article is aimed at presenting the essence and determinants of knowledge and innovation management in agribusiness. The results of analysis indicate a need for a systemic approach to research into and actors involved in knowledge and innovation management and transfer as well as for cooperation of these actors. A specific role is played here by agricultural and science policies implemented by the state and various institutions operating in the agribusiness environment. The involvement of the state results from the unquestionable role of knowledge and innovation for the development of the economy and society but also from the specifics of agribusiness. In Poland, research on agribusiness is conducted by institutes and universities, most of which are public, hence their activities are financed from the state budget. Therefore, it is necessary to make the best use of research potential to achieve the set objectives of socio-economic and science policies and to finance new research and innovation consistent with these policies. Possible tools for knowledge and innovation creation in agribusiness include central, regional and local government programmes and projects focused on the implementation of specific goals and tasks (e.g. an agricultural innovation network), financial instruments as incentives to explore a particular research topic or undertake a particular innovation, and institutional instruments. For the efficient functioning of the entire system of generation, implementation and dissemination of research results, it is important, on the one hand, that information is acquired about the current needs of practice and, on the other hand, that the results of hitherto research are transmitted.

INTRODUCTION

European Union policy emphasises support for cooperation between the world of science and business, leading to innovation and innovation implementation [EU 2012, MRiRW 2014, Wiatrak 2018a]. This approach stems from the need for environmental protection and sustainable development but also from a drive to improve resource efficiency and boost competitiveness in the food market. These issues are not new but they are not yet fully resolved, especially in Poland. Therefore, this article attempts to present the essence and determinants of knowledge and innovation management in agribusiness. The aim hereof is cognitive, but also – as a supplement – applicative.

The source material forming the basis for considerations covered: related literature and personal reflections. Data processing methods, namely analysis and synthesis, were used.

THE ESSENCE OF KNOWLEDGE AND INNOVATION MANAGEMENT

Knowledge is all information acquired through learning and experience, a pool of reliable and useful information about reality, together with the ability to use it for personal and/or organisational purposes [Brilman 2002, Koźmiński et al. 2014]. The foundation of knowledge is information, yet it must be verified and prepared in accordance with its intended key application. However, the extent to which this knowledge is used and applied depends on the skills and competences of employees (especially management staff) and organisation management including knowledge management. Therefore, a knowledge hierarchy should be considered that links the following categories [cf. Brilman 2002, Koźmiński et al. 2014]:

1. Signs – observable elements of reality, single signals;
2. Data – a set of unstructured and unconnected signals;
3. Information – structured, categorised and classified data;
4. Knowledge – structured, interpreted and accepted information;
5. Skills – the use of knowledge in action;
6. Competences – all knowledge, experience, skills and attitudes, together with a readiness to act.

Knowledge may be explicit or tacit knowledge disseminated by means of communication [Nonaka, Takeuchi 2000]. It is important to know the sources of its generation and apply it in the management process. When analysing knowledge in an organisation, three aspects that have an impact on the functioning of the organisation and the management process should be taken into account, namely [Klincewicz 2013]:

– knowledge as a resource that can be accumulated, preserved and disseminated,
– knowledge as a product that emerged as a result of the organisation's and employees' activity in this field,
– knowledge as a limitation resulting from its previous use (such as experience, habits, failures, etc.).

These aspects affect both the perception of knowledge and its management system consisting of the following stages [Probst et al. 2002]:

– locating and acquiring knowledge, including its collection and selection,
– developing and creating knowledge, including transforming tacit knowledge into explicit knowledge,
– knowledge transfer understood as sharing and dissemination,
– using knowledge for specific activities, including the introduction of innovation,
– preserving and updating knowledge.

Knowledge management is thus a process, which is why it is important to link individual stages and undertake organised actions targeted at specific activity, depending on the goal. All elements of the knowledge management system are needed to provide grounds for analysing the existing situation, preparing changes, developing strategies, introducing innovation, etc.

Innovation is the practical application of new (tangible and intangible) solutions in relation to a process, product (good or service), marketing or organisation. On the one hand, it consists of the effects of R&D in organisations and research units, carried out

independently or in cooperation. On the other hand, it results from the acquisition of knowledge from other organisations through the purchase of patents, licences, ready production and organisational solutions, modern machinery, equipment and services related to their launch, etc. Innovations have different characteristics. Taking into account their use in an organisation, the following can be distinguished: process, product, organisational and marketing innovations [OECD 2005].

Innovations should also be managed through actions concerning the creation and implementation of new technological, biological, organisational and managerial solutions. On the one hand, these actions are a corollary of knowledge possessed and the activity of managers. These actions should also be viewed from a process-based perspective, taking into account the current use of knowledge and the need to innovate.

KNOWLEDGE CREATION IN AGRIBUSINESS

Agribusiness encompasses the following links: agricultural production, agri-food processing, storage and logistics, the sale of agricultural products and food, and the production of machinery and equipment for agriculture and the food industry [Akridge et al. 2012]. Actors in individual links of agribusiness create and can create specific knowledge that facilitates their operation and further development. Research conducted by agribusiness actors usually concerns innovation (of products, the organisation, management, etc.) resulting in a possible increase in competitiveness and business efficiency. However, such research is not undertaken by all actors due to their financial capacity and research efficiency (especially research conducted in small units). Most agribusiness actors use the results of both business and scientific research developed in other organisations. The results of business and scientific research complement each other, forming a basis for analyses, comparisons, new solutions, the implementation of innovations, etc.

In the case of agribusiness, in particular agriculture, the state's share in research funding is significant. This is usually associated with the insufficient profitability of agriculture and the small scale of conducted activity. That is when the state steps in, as exemplified by programmes implemented by the European Union that support research for agribusiness [EU 2012, MRiRW 2014]. In addition, it should be stressed that scientific research and the dissemination of its results are generally a matter for state and government agencies. This is due to the unquestionable role of knowledge and innovation for the development of the economy and society.

In Poland, research on agribusiness is conducted by specialised research institutes, the Polish Academy of Sciences and universities. Statutory tasks of particular types of research institutions in Poland are varied, as reflected by the scope, implementation and practical dissemination of their research (Figure 1). This diversity is influenced by the nature of the research institution, the sources of its financing and its own research activity. Most of these institutions are public and their research potential is mostly financed by the state budget. Therefore, it is necessary to make the best use of research potential to achieve the set objectives of socio-economic and science policies (for example, sustainable agriculture, environmental protection) and to finance new research and innovation consistent with these policies.

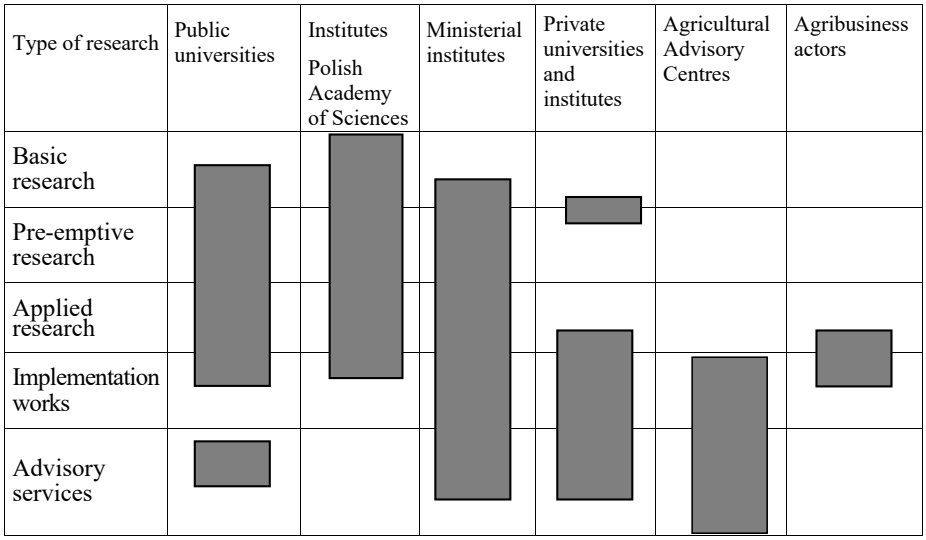

Figure 1. Division of areas of activity in agribusiness research
Source: study based on [FAPA 1994]

Figure 1 shows the division of research activity areas resulting from the nature of activities and funding sources and partly also from the current activity of individual types of research units and agribusiness actors. Basic research primarily falls within the competence of the institutes of the Polish Academy of Sciences, followed by public universities and ministerial institutes, although to a lesser extent in the latter case. In turn, pre-emptive and applied research can be carried out by all three institutions. On the other hand, private universities and institutes conduct little basic and pre-emptive research, yet their involvement in applied research is increasing. Implementation work is undertaken by all these institutions, yet only ministerial institutes and private universities and institutes do so to a full extent. One should also take into account agribusiness actors (agricultural holdings, food processing companies, etc.), some of which undertake and can undertake applied research and implementation work. Research by these actors is primarily business-related but has an impact on the creation and dissemination of knowledge. As shown in Figure 1, advisory services are also included in the agricultural knowledge system for implementation work. Working with farmers and entrepreneurs, advisers know their needs, can contribute to the implementation of research results focused on the use of innovation, and agree to participate in the research programme. It is also advisable to use agricultural school farms for implementation, where teachers, advisers and academics could cooperate. Unfortunately, many of these farms have already been closed down.

These agricultural knowledge system institutions should cooperate in all types of research, from basic research to implementation, advice and education. The state plays an important role in this respect through its policy and research funding in line with this policy. Possible tools for knowledge and innovation creation in agribusiness include central, regional and local government programmes and projects focused on the implementation

of specific goals and tasks (e.g. an agricultural innovation network), financial instruments such as a system of tax breaks and exemptions, financial preferences and incentives, etc., to explore a particular research topic or introduce a particular kind of innovation, and institutional instruments such as public procurement, public-private partnership, agricultural advice, etc. [cf. Czerniak 2013, Jasiński 2014]. An effective impact on public and private research units should be exerted through agreements concluded under grants, contracts, arrangements, etc., that specify the expected effects, the method of research funding and its settlement.

KNOWLEDGE TRANSFER AND IMPLEMENTATION OF INNOVATION IN AGRIBUSINESS

Knowledge transfer is the process of knowledge transmission to practical use [Wiatrak 2018b]. The results of scientific research should find a practical application as soon as possible, which proves the efficiency of funds spent on research. Hence, it is advisable to consider how to organise the transfer of knowledge to the agribusiness practice in order to improve the efficiency of current activities, the planning and development of a policy of changes through the application of results and knowledge. This transfer is part of the commercialisation of research results, hence it must also be regulated and prepared.

Knowledge transfer in agribusiness should be based on institutions participating in its research system, agriculture and science ministries, and links and arrangements among them. The Ministry of Agriculture and Rural Development, implementing agricultural policy and rural development policy, has specific priorities for research in agribusiness. These priorities delineate the orientation for research funding and implementation. The role of the Ministry of Agriculture in this respect is therefore:

– to set research priorities in agribusiness,
– to identify demand for research on the side of practice,
– to establish rules for the financing and distribution of funds,
– to conclude agreements with research institutions and other related actors (e.g. within a consortium) concerning the exploration of specific research topics.

If specific orientations for research supported by the Ministry of Agriculture and Rural Development are adopted, it is necessary to define the methods of research funding. Therefore, the Ministry of Science and Higher Education should be consulted so as to fit into the existing ways of supporting research. If the arrangements of these ministries do not lead to the implementation of the adopted research orientations, then inter-ministerial arrangements must be made and priorities must be selected. The adoption of specific research orientations and methods of research funding allows for the preparation of contract implementation and, subsequently, the transfer of research to practice. The same mechanism occurs in research financed by companies, regional and local governments and non-governmental institutions.

For the efficient functioning of the entire system of generation, implementation and dissemination of research results, it is important, on the one hand, that information is acquired about the current needs of practice and, on the other hand, that the results of the hitherto research are transmitted. Research results should, on the one hand, strengthen and

specify the expectations of agribusiness practice and, on the other, point to new solutions, the application of innovation and ways of implementing innovation. At the same time, future needs of agricultural practice should also be identified by research institutions. The tasks of research institutes, universities, research teams, etc., include:

– conducting research in accordance with set priorities and practice needs,
– preparing research results as required,
– transfering research results to the environment,
– participating in the implementation of own research results and the introduction of innovation,
– organising training and advice concerning research results implemented in practice.

An important role in the transfer of research results is played by advice, especially agricultural advisory centres [Dąbrowski, Matuszak 2018]. These centres report problems of agricultural practice, the solution of which exceeds their capabilities and requires co-operation with science. It should be emphasised that advisers from these centres generally know the needs of recipients of their services well and are the main providers of research results in practice. This is because the crucial source of information about agricultural innovation is the advice of agricultural advisory staff, followed by specialist press and the internet, and then courses and training, television, trade fairs, exhibitions and agricultural exchanges. In contrast, radio and scholarly publications are least significant in this role [Harasim et al. 2017]. Advice for farmers covers knowledge from various industries, yet recent years have witnessed a decreasing importance of technological advice provided by agricultural advisory centres, the advice of which used to dominate advisory services in the past. Simultaneously, the significance of commercial companies is increasing. Such companies provide advice in this area from the point of view of input sold. These are two areas of advisory services, each governed by its own logic. An important advantage of state agricultural advisory services is objectivity, i.e. advice provided only from the farmer's point of view. In this context, a return to such advice should be considered as it is the basis for assessing proposed solutions, implementing innovation, changing technologies and agricultural engineering, etc. In order to cope with competition in the market, agricultural producers should constantly deepen their technological knowledge about plant and animal production so as to be able to assess and choose solutions delivered [Babuchowska, Marks-Bielska 2017, Dąbrowski, Matuszak 2018].

Advice plays a substantial role in the transfer of research results, hence cooperation between science and advisers should be based on the implementation of joint tasks stemming from the orientations of support defined by agricultural and science policies and from current advisory needs of farmers and entrepreneurs in agribusiness. Advisory services can be a link in the transfer of knowledge, not only for farmers but also for agribusiness companies. Individual agribusiness companies can cooperate directly with research institutions or conduct research themselves. Direct cooperation means both reporting the demand for specific innovation and practical solutions and purchasing ready solutions, patents, innovations, etc., and implementing them. Agribusiness companies can be a link in the transfer of research results to cooperating units. This can be exemplified by the cooperation of food industry enterprises with farms. These enterprises require farmers to implement a certain technology and comply with its requirements and disciplines to produce products

of specified quality and particular standards. Similar requirements can be imposed on other companies working for agribusiness (e.g. those preparing packaging for agricultural products). The introduction of innovations and changes can be combined with assistance in financing them, in particular in raising funds (e.g. as a guarantor of their repayment).

CONCLUSIONS

The knowledge and innovation system for agribusiness needs can accommodate many organisations (central, regional and local government, non-governmental organisations and agribusiness companies) within its links. This requires a systemic approach to research and actors involved in research conduct and transfer. Therefore, their cooperation and knowledge and innovation management are important, starting at the stage of identifying research needs, through knowledge creation, and ending with its practical testing and innovation implementation. A considerable task, in this respect, is performed by institutions operating in the agribusiness environment, whose role is to link various stages of creation, transfer and the implementation of knowledge and innovation. A specific role is played here by agricultural and science policies implemented by the state and institutions operating in the agribusiness environment, in particular agricultural advisory centres.

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Słowa kluczowe: agrobiznes, wiedza, innowacja, zarządzanie, rozwój

ABSTRAKT

Celem artykułu jest przedstawienie istoty i uwarunkowań zarządzania wiedzą i innowacjami w agrobiznesie. Wyniki analizy wskazują na potrzebę systemowego ujęcia badań i podmiotów uczestniczących w ich prowadzeniu i transferze oraz na ich współpracę. Szczególną rolę w tych działaniach mają polityka rolna i naukowa – realizowane przez państwo i różne instytucje funkcjonujące w środowisku agrobiznesu. Zaangażowanie państwa wynika z niekwestionowanej roli wiedzy i innowacji dla rozwoju gospodarki i społeczeństwa, ale także ze specyfiki agrobiznesu. Badaniami naukowymi związanymi z agrobiznesem w Polsce zajmują się instytuty i uczelnie, których większość ma charakter publiczny, a ich działalność jest finansowana przez budżet państwa. W związku z tym należy jak najlepiej wykorzystać posiadany potencjał badawczy do realizacji założonych celów polityki społeczno-gospodarczej i naukowej, a także finansować nowe badania i innowacje, które są zgodne z tą polityką. Narzędziami kreowania wiedzy i innowacji w agrobiznesie mogą być programy oraz projekty rządowe i samorządowe, ukierunkowane na realizację konkretnych celów i zadań (np. sieć innowacji rolniczych), instrumenty finansowe – zachęcające do zajęcia się określonym tematem badawczym, czy innowacją, a także instrumenty instytucjonalne. Dla efektywnego funkcjonowania całego systemu tworzenia, wdrażania i upowszechniania wyników badań naukowych ważny jest, z jednej strony, sprawny przepływ informacji do nauki o aktualnych potrzebach praktyki, a z drugiej – przekazywanie wyników dotychczas prowadzonych badań.

AUTHOR

ANDRZEJ PIOTR WIATRAK, PROF. DR HAB.
ORCID: 0000-0002-0962-2805
University of Warsaw
Faculty of Management, Department of Theory of Organization and Management
1/3 Szturmowa St., 02-678 Warszawa, Poland