Sources of Strategic Information in Farm Management in Poland. Study Results

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Abstract

Purposes: The main goal of the paper is to determine the significance of selected sources of strategic information, used by Polish farmers in decision making. In addition, an attempt was made to determine the factors impacting the evaluation of those sources among the traits of the farmer and his farm.

Methodology: Data was gathered using the questionnaire method and analysed with standard tools of descriptive statistics.

Findings: The farmers deemed personalised sources of strategic information the most important, especially agricultural advisers, input suppliers and buyers of agricultural products. From among institutional (non-personalised) sources, local government and the chamber of agriculture were significant. Business information agencies and survey companies are the least important sources for farmers. The characteristics of the surroundings of the farm – specifically, its geographic location and the size of settlement where it is located proved to have the widest impact on the evaluation of the sources included in the study. From among the organisational factors, only farm size has a significant impact.

Research limitations/implications: The study was confined to a representative group of farmers in Poland. A closed list of sources of strategic information was used.

Originality/value: The study results contribute to the knowledge on the functioning of Polish agriculture and may also be used in comparative studies, characterising this sector's diversity within Europe. They can in turn contribute to properly focusing on supporting the policy of balanced agriculture development in the EU.

Keywords: strategic management, strategic information, farm management

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Introduction

Agriculture is a unique sector of the modern economy. Its specific nature is shown especially by the example of the European Union and its common agricultural policy. Agriculture's share in EU GDP is small, oscillating at around 1.2%. Ca. 6% of all workers are employed in agriculture, which is also not a significant number. Nevertheless, agriculture, along with small and medium businesses, is the sector supported the most with EU funds. In the years 2010–2015 40–47% of EU budget spending was allocated to common agricultural policy, reaching the sum of 293 billion Euros a year. Despite the fact that the share of these expenditures in the total EU budget decreases each year, they are still make up the core of the aid policy (*EU*, 2012).

In Poland, agriculture produces from 3.4 to 4.9% GDP, employing 14–16% of all workers. The core of Polish agriculture consists of private, family-owned farms, whose products constitute almost 10% of the value of Polish exports (*Polska 2012...*, 2013). A family--owned farm is an especially complex system. Its most important characteristics are the complexity of processes and organisation, resulting from the organic character of production and family-based, often paternalistic organisation. Paternalism is especially expressed by cultivating family values and giving priority to the family's development. However, there are undeniable examples of adaptation in the opposite direction, subjecting the behaviour of farmer family members to the needs of the farm. Therefore, farms' characteristics, distinguishing them from other economic entities, are most importantly (Kondraszuk, 2005, p. 514):

1) high systematic risk related to significant use of unpredictable forces of nature in agricultural production, characterised by a long operational period and thus a hard-to-predict outlet,
2) existence of two interpenetrating economic subsystems characterised by different goals: the production farm and the farmer's household.

Using the forces of nature mentioned above, a farmer aims to attain stable, economically profitable and socially acceptable production in a way which does not threaten the natural environment and contributes to achieving the goals of the household. It is a very difficult task, requiring a great deal of care in preparing and implementing decisions. It applies primarily to long-term decisions, influencing the production strategy by taking into account natural conditions and joining together the economic and personal goals of the farmer.

Nowadays there is no doubt that the quality of the management process plays a vital role in achieving goals (e.g. Pirsig, 1974, p. 228; Feingenbaum, 1991). In this context, the main assumption of this paper is that researching current and seeking new determinants of farm management, meeting today's requirements, is an important task from the viewpoint of agriculture efficiency and its results, and therefore for the effectiveness of EU aid policy.

The studies conducted so far (e.g. Conlisk, 1996; Williams, 2002, p. 15; Radomska, 2013; Elsukov, 2015) show that information is the key factor influencing the decision-making process. As Penc says (1994, p. 83): "a well-made decision is based on at least 80% of information, 10% of inspiration (creativity) and 10% of manager's intuition". This means that management effectiveness is determined, among other factors, by the source of this information (Meadow and Yuan, 1997; Citroen, 2009, p. 64).

The goal of this article is to determine the significance of selected strategic information sources used by Polish farmers in decision making. In addition, we tried to determine the basic factors differentiating the obtained results. For this purpose, we used the questionnaire method of obtaining data, which were studied using basic metrics of descriptive statistics. The study results contribute to knowledge on the functioning of Polish agriculture and may be also used in comparative studies, characterising this sector's diversity within Europe. Such studies may in turn contribute to properly focusing the policy supporting a balanced agriculture development in the EU.

Strategic information, its significance for management and classification of sources

Strategic information is one of the key factors influencing the quality of decisions made and thus the success of the farm. Properly prepared, suitable for the problem and provided on time, it reduces uncertainty, enables an estimation of the risk, opportunities and threats stemming from choosing a certain course of action for the organisation (Meadow and Yuan, 1997; Sopińska, 1999). According to Porter (1985), information may distinguish an entity from its competition, leading to a competitive advantage. This is the reason for the currently increasing need for information supporting decision making, including in agriculture.

Strategic information is information used by managers in the management process during strategic decision making. It means that it applies to goals fundamental for the organisation, related to its vision and mission, decisions influencing its existence and

operation in a long time horizon, from which its other tasks and functions are derived (Choo, 2006; Citroen, 2009, p. 47).

The classical information communication model (wider description: Shannon, 1948) includes three basic elements: a transmitter and a receiver connected via a channel used for transmitting the information. The transmitter operates on the message in some way to produce a signal suitable for transmission over the channel. Information used by the transmitter is derived from specific sources. An information source produces a message or sequence of messages to be communicated. It decides on the content of the messages. In this context, the information source significantly influences its understanding by the receiver and as a consequence its use in decision making (see: Crawshaw, 1992; King and Griffiths, 1991; Noorderhaven, 1995, p. 29; Meadow and Yuan, 1997).

The topic of sources, role and significance of strategic information in the management process was studied, among others, by Allen (1990), Meadow and Yuan (1997), Kroll and Forsman (2010), Citroen (2009; 2011), Baldea and Balteanu (2014). In Poland, studies were conducted among others by Sopińska (1999), Maik, Gołoś, Szczerbacz and Walkiewicz (2010), Dyczkowska and Dyczkowski (2015), Tunowski (2015). These studies show that information plays a significant role in developing the strategies of various organisations. Historically, its role increased with economic development. This increase is especially influenced by information technologies. Regarding the strategic information sources, mentioned by the authors, above, all agree that the situation is more diverse. The number and significance of sources depend on the time, place and nature of the business, as well as legal considerations applying to the organisation's operations. Furthermore, the studies mentioned above focused mainly on enterprises. It means that conducting new research aiming at determining the information sources and their significance for managers, including their replication in time on various markets for various organisation types, is fully justified. The results of this research enable not only the current state, but also the direction of changes in this regard to be determined. This has a large impact on the progress of knowledge in the field of information management, and as a consequence, on its use in business practice, e.g. in constructing and implementing information systems.

Research on sources of information used in management has a long tradition worldwide. The literature review performed by De Alwis, Majid and Chaudry (2006) indicates the two basic research problems that most authors attempted to address:

1)   What criteria should be used for classification of information sources and how should they be classified, taking into consideration their dynamic changes?

2)   Which of the information sources identified are important for managers in making decisions?

Research on the first question was started by Aquilar (1967), who constructed the first general classification of information used in management. This classification was developed and verified, among others, by Elenkov (1997), Zimmer, Henry and Butler (2008) and Agarwal, Xu and Poo (2011). Research showed that sources of management information may be classified in two basic dimensions:

1)   internal versus external – being part of the organisation or functioning in its environment,
2)   personalised versus non-personalised – those for which the transmitter may be identified as a specific person (group of persons) and those related to databases of various origin, where human participation is only indirect.

Polish authors also refer to this classification. The most comprehensive catalogue of strategic information sources was given by Woźniak (2005). It is based on the division developed by Elenkov (1997) and modified by Sopińska (2001). Such classified sources can provide different information. The demand for types of strategic information in farm management in Poland has been examined by Jaworski, Sokołowska and Kondraszuk (2015). Table 1 shows a catalogue of the information sources, with an addition of the items and positions characteristic for agriculture.

The research conducted so far (Keegan, 1974; Daft, Sormunen and Parks, 1988, Gilbert, 2003; Lin, Cole and Dalkir 2014) shows that managers typically prefer information from personalised sources. Regarding external and internal sources, there is no general agreement in the literature. Some studies, e.g. Keegan's (1974) Lackman's, Saban's and Lanas's (2000) prove that internal sources are used more often. On the other hand, e.g. the studies by Bouchet, Hopkins, Kotherll and McKnight (1988) and Frishammar (2003), showed that external information is preferred.

The factors influencing the information used by managers were studied less thoroughly than the significance of each information source for decision making. The main classifications of those factors were derived from theoretical considerations on the decision-making process. One of the first classifications was proposed by Brenner (2005), into political, sociological and economic factors. Among the economic factors, he distinguished environmental, legal and organisational factors. This distinction was expanded and ordered by De Alwis et al. (2006). In their model, two groups of factors determining information needs are distinguished: situational and contextual factors. The former

were divided into two subgroups: organisational factors (organisation type, organisational culture etc.) and environmental factors (stemming from the environment, e.g. legal and sociological considerations, the organisation's sector etc.).

Table 1. Classification of strategic information sources

Origin	Character	Example of a source
External sources	Personalised sources	Business information agencies (researchers, detectives)
		Input suppliers
		Buyers of agricultural output
		Agricultural advisers
	Non-personalised sources	Central government (government, its agencies and other organs)
		Local government (community, county, voivodeship and their organs)
		Financial institutions (banks and insurance companies)
		Public opinion survey firms
		Companies conducting specialised agricultural market research
		Universities and other scientific and research institutions
		Chamber of agriculture
Internal sources	Personalised sources	Management (managers on various levels)
		Other employees
	Non-personalised sources	Accounting (financial reports)
		Other information systems

Source: own work.

The contextual factors are those related to the kind of decision being taken and those which characterise the quality of the information obtained (credibility, accessibility, comprehensibility etc.). Lin and Dalkir (2010), using a different distinction criterion, distinguished four groups of factors: (1) culture-related, especially related to national culture, (2) political and institutional, (3) organisational and (4) individual.

The mechanism of the effect of the above factors on the choice of information sources and its flow was studied, among others, by Sachdev and Bello (2014), Chmielecki (2015), Ciszewska-Mlinarić and Trąpczyński (2016). The studies show that the psy-

chological mechanism plays the main role in decision-making surrounding various features of the decision maker and its micro and macro environment.

Research on information sources used by farmers for management was conducted, among others, by Jones (1990), Schnitkey, Batte, Jones and Botomogno (1992), Ortmann, Patrick, Musser and Doster (1993), Gloy, Akridge and Whipker (2000), Just and Zilberman (2002) and Adhiguru, Birthal and Kumar (2009). These studies show that farmers more often use external, personalised information sources. These include other farmers (neighbours and acquaintances) and input suppliers. In subsequent studies, the growing importance of consultants and advisors as sources of information is visible. A downward trend can be seen in the case of produce buyers and institutionalized sources. Internal sources typically do not exist or are not used.

Until now, research among Polish farmers has been conducted locally and has not left the phase of initial exploration. Identification of information sources was the subject of studies by Dzieża (2003), Cupiał (2010), Jaska (2012) and Krzyżanowska (2012). It is difficult to derive unambiguous conclusions from these studies, as they included communication channels (television, Internet) along properly defined information sources (e.g. research facilities, local government). However, their results suggest that significant information sources may include agricultural advisers, neighbours and local government.

The empirical studies of factors affecting the use of various information sources in farm management were conducted by Ford and Babb (1989), Gloy, Akridge and Whipker (2000), Ngathou, Bukenya, and Chembezi (2006). Factors that appeared to be related to the perceived usefulness of information sources include farm ownership, farmers' age, and having a marketing plan. Factors such as education, sales, type of production were infrequently, if ever, related to the usefulness of information sources. The influence of other factors studied was generally insignificant. In all studies, the revealed dependences had a weak strength. As yet no similar studies have been conducted in Polish conditions

Material and research methodology

Taking into account the aim of the study and the literature review above, we can formulate two basic research problems:

1) What information sources do Polish farmers use most often, treating them as significant for strategic decision making?
2) What factors significantly determine the evaluation of each strategic information source?

We attempted to answer those questions based on surveys. They covered farms from all across Poland, randomly selected using stratified sampling, preserving the structure of the general population (*Charakterystyka gospodarstw…*, 2011). Table 2 shows selected quantitative data on the research sample. The survey was conducted using the direct PAPI (Paper and Pencil Interview) method. After all incomplete or incohesive surveys had been rejected, 338 valid responses were obtained.

Table 2. Structure of the farms surveyed in accordance with selected characteristics

Distinction	Number	%	Distinction	Number	%
Time of managing the farm			**Manager's sex**		
0–5 years	42	12.4	Female	67	19.8
Above 5 years	296	87.6	Male	271	80.2
Agricultural type			**Area**		
Open field cultivation	121	35.8	Up to 5 ha	58	17.2
Animal husbandry	98	29.0	6–15 ha	125	37.0
Horticulture	12	3.6	16–50 ha	111	32.8
Fruit-growing	16	4.7	51–300 ha	37	10.9
Mixed	91	26.9	above 300 ha	7	2.1
Region					
Lesser Poland and Pogórze	83	24.6	Mazovia and Podlasie	162	47.9
Pomerania and Mazury	29	8.6	Greater Poland and Silesia	64	18.9
Total number of respondents				**338**	**100.0**

Source: own work.

The respondents were asked what information sources are the most important for them and most often used for strategic decision making, taking into account the needs of a person managing a farm. The respondents evaluated the significance of information

sources defined in Table 1 in the scale from 1 to 5 (1 – the least significant, 5 – definitely the most significant). The survey allowed many information sources to be given the same note. For analysing the results, statistical tools were used, especially metrics of central tendency and of distribution variability of the notes given (Aczel, 2000).

The search for the factors differentiating the farmers' answers was based on the *Chi²* independence test for qualitative variables. The strength of the correlations diagnosed was measured with the C-Pearsona contingency coefficient and Chuprov's T association coefficient (Aczel, 2000). For the test *Chi²*, the p = 0,05 significance level was assumed. For correlation strength measures, the following coefficient values were determined:

- 0.0–0.3 – weak correlation,
- 0.3–0.6 – moderate correlation,
- 0.6–1 – strong correlation.

Due to the limited scope of the questionnaire, only selected characteristics of the farmer were taken into consideration while studying the factors influencing the evaluation of the information sources listed. In addition to the traits of the farmer and his farm listed in Table 2, the study includes:

1) Age of the farmer: <25, 26–35, 36–50 and >50 years;
2) Education: basic or vocational non-agricultural, vocational agricultural, secondary vocational agricultural, secondary general, higher agricultural, other higher,
3) Settlement's population: <100, 100–500, 500–3000, >3000 inhabitants,
4) Level of farm income: <11 th., 12–22 th., 23–111 th., 112–222 th., >222 th. EUR,
5) Kind of employment: running the farm alone, running the farm with family help, using the seasonal lease, employing a permanent staff,
6) Number of employees: 1, 2–9, 10–19, 20–49 persons,
7) Farm vision: farmer has a quite clearly defined vision, farmer has a vision, but quite general, farmer has no vision, but often thinks about it, farmer has no vision and does not wonder about it,
8) Farm strategy: it is developed in writing and it is rigorously implemented, the strategy is developed in a written form, but its implementation is not rigorously followed, the strategy exists, but it is not formalized – the farmer tries to realize targets, the strategy exists, but it is not formalized – strategy goals are treated very flexibly, the strategy has not yet been formulated.

Study results

Table 3 shows calculations characterising numerically the answers to the survey question, ordering them by arithmetical mean. The resultant, average note of significance of information sources in strategic decision making at Polish farms was 2.55. The most common note was 1.0. The median of the answers was 2.0. A large variability coefficient (55.2%) shows their large dispersion. The answer distribution exhibits right-handed asymmetry, indicating that the farm managers typically evaluated significance of the information sources studied below the calculated mean.

Table 3. Measures characterising answers to the survey question

Information source	Managers' notes — basic measures					
	Arithmetical mean	Dominant	Median	Standard deviation	Variability coefficient [%]	Asymmetry coefficient
Agricultural advising centres	4.3343	5.0	5.0	0.8029	18.52	- 1.2661
Input suppliers	3.6183	4.0	4.0	1.2153	33.59	- 0.6224
Agricultural produce buyers	3.1805	4.0	3.0	1.2775	40.17	- 0.2473
Local government (community, county, voivodeship and their organs)	2.9793	4.0	3.0	1.2645	42.44	- 0.0583
Chamber of agriculture	2.7633	3.0	3.0	1.3131	47.52	0.0805
Financial institutions (banks, insurance companies)	2.6509	3.0	3.0	1.1769	44.40	0.1342
Central government (government, its agencies and other organs)	2.5207	1.0	3.0	1.2733	50.51	0.3135
Universities and other scientific and research institutions	2.2544	1.0	2.0	1.2231	54.25	0.5998

Companies conducting specialised agricultural market research	1.8698	1.0	2.0	1.0137	54.21	0.8826
Public opinion survey companies	1.7071	1.0	1.0	0.9622	56.36	1.0778
Business information agencies	1.6568	1.0	1.0	0.9407	56.78	1.3150
Other	1.0976	1.0	1.0	0.5707	52.00	6.0774
Total	2.5528	1.0	2.0	1.4092	55.20	0.3360

Source: own work.

From among the sources specified in the survey, agricultural advising centres proved to be the most important for the managers in making strategic decisions (mean 4.33). Most often they received a 5.0 note. The number of such notes was equal to the total number of other notes. The second strategic information source in terms of significance and usage by the farmers was input suppliers. The arithmetical mean was much lower in this case than for advising centres, but still exceeded the middle of the scale used – 3.62. The most common note was 4.0. Half the answers were higher than or equal to this note. The middle of the evaluation scale was also exceeded by buyers (3.18). Like in the case of suppliers, the dominant note was 4.0. Half the answers, however, were below 3.0.

The managers considered local government (2.98), chamber of agriculture (2.76) and financial institutions (2.65) to be moderately significant sources of strategic information. In all those cases the median was 3.0. It was also the most common note, except for the local government, for which 4.0 was dominant.

The mean note above 2.0 was also given to central government (2.52) and universities and other scientific and research institutions (2.25). The respondents considered companies conducting specialised agricultural market research (1.87), public opinion survey companies (1.71) and business information agencies (1.66) to be the least significant and used the least often. The farmers surveyed did not indicate sources other than those specified in the questionnaire, which would generate significant strategic information, evaluating them on average on the 1.10 level.

Variability coefficients increasing with decreasing arithmetical mean of the notes indicate that the less significant an information source, the larger the dispersion of

the answers given. For more significant information, a manager's evaluations were more closely grouped around the mean (variability coefficients 18.52–40.17%). The sources indicated as less significant were more doubted by the managers (variability coefficients 50.51–54.25%). For the least significant sources, the highest variability coefficients were estimated (54.21–56.78%).

Positive and relatively high asymmetry coefficients for most strategic information sources studied indicate that the answer distribution exhibited strong right-handed asymmetry. This means that a vast majority of the answers given were lower than their arithmetical mean. Only for four of the most highly evaluated sources di the answer distribution have a left-handed asymmetry. Therefore, their notes were usually higher than the arithmetical mean. Among the asymmetry coefficients, relatively small values dominate, indicating that the differences in the number of notes below and above the mean were not significant for the resultant note.

Attachments 1 and 2 show calculations regarding the dependence of the answers obtained on the individual traits of the farmer and the farm, respectively. From among thirteen factors studied, dependence was found in ten cases. All the correlations diagnosed are weak.

The only individual (sociological) trait of a farmer, differentiating the answers given, is sex. This only influences the evaluation of input suppliers as strategic information sources. For the remaining traits (education, age and experience) no dependence was found. From among the farm traits, external (environmental) factors had a wider influence on the strategic information source evaluation. The geographical location of the farm (region) impacts on seven out of the twelve sources The dependence described above is presented in Figure 1. The number of inhabitants of the settlement where the farm is located impacts the evaluation of five information sources (Figure 2).

Input suppliers, local government, agricultural chambers and financial institutions were evaluated the highest by the farmers from Pomerania and Mazury. Central govern-ment, universities and scientific institutions were evaluated by those farmers the lowest. Suppliers as well as the agricultural chamber were given the lowest notes in Mazovia and Podlasie, while local government and financial institutions in Greater Poland and Silesia. The farmers from Mazovia and Podlasie gave the highest notes to scientific institutions compared to the farmers from other regions, while the farmers from Lesser Poland and Pogórze gave relatively higher notes to central government.

Figure 1. Evaluation of strategic information sources depending on the geographical region where the farm is located
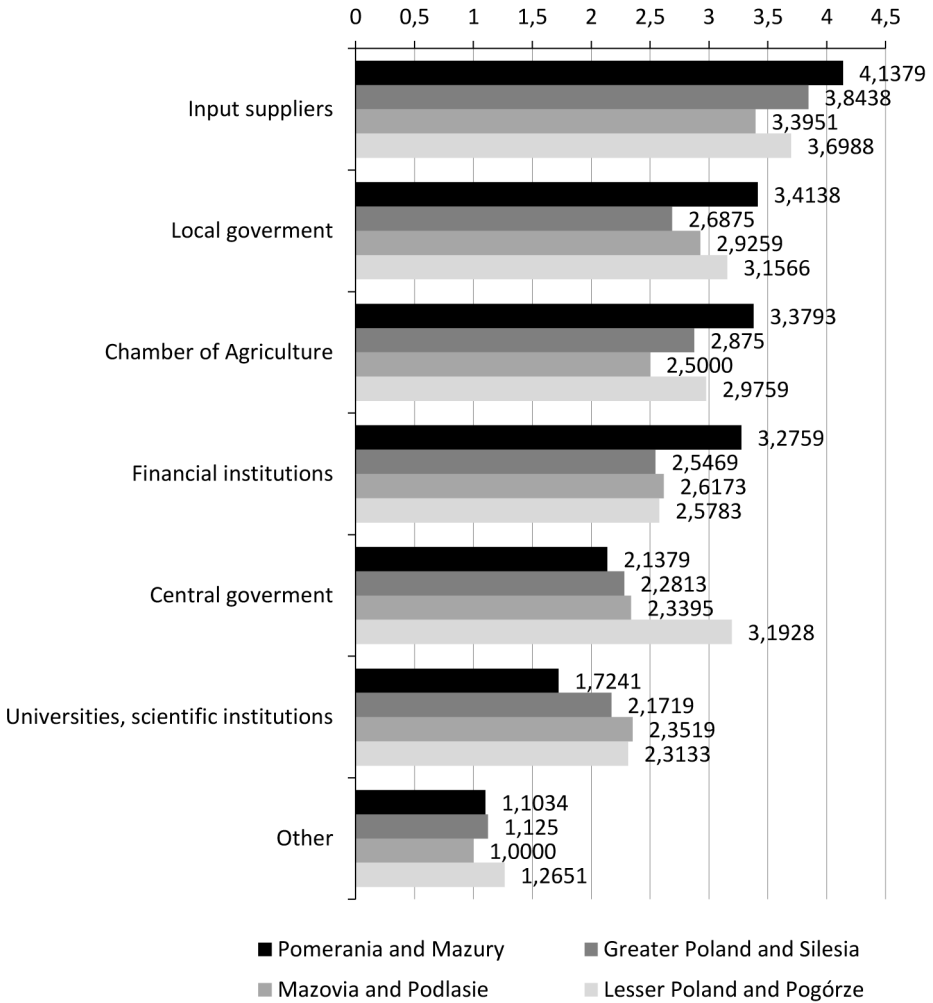
Source: own work.

Regarding the inhabitants' number as a factor differentiating the farmers' answers, financial institutions were evaluated the highest by the farmers from the smallest villages. Other sources were evaluated the highest by inhabitants of settlements with a population above 3000. The farmers living in the smallest settlements, compared to others, attached the lowest significance to input suppliers and buyers of agricultural products. Local and central government organs and financial institutions were given the lowest notes among the inhabitants of settlements with a population between 100 and 500.

Figure 2. Evaluation of strategic information sources depending on the number of inhabitants in the settlement where the farm is located
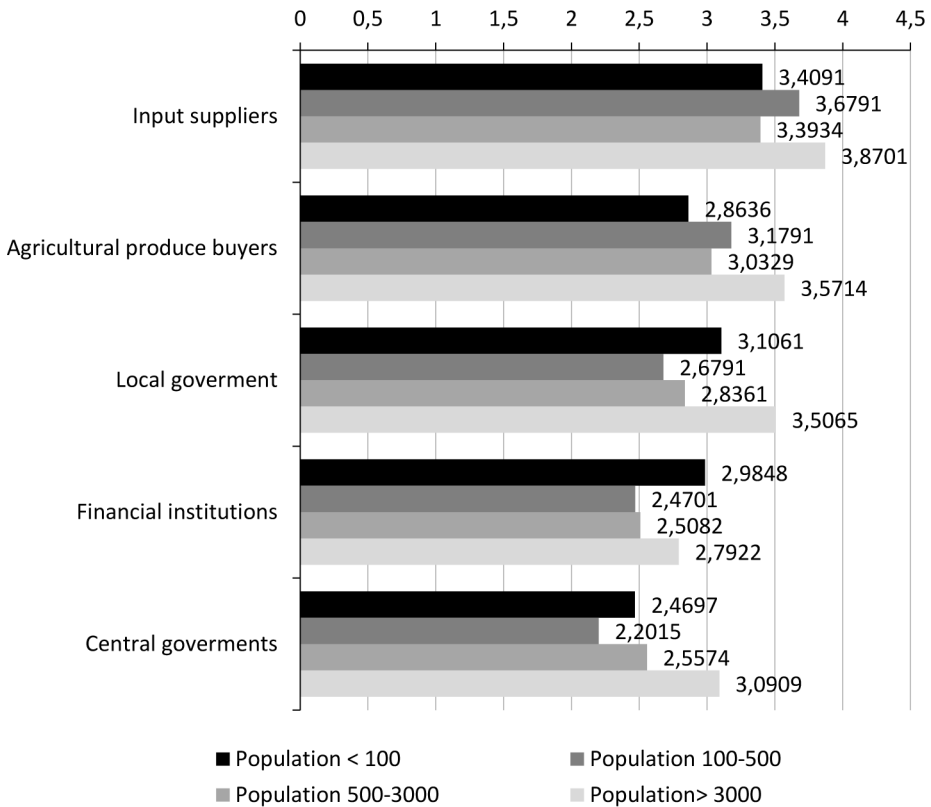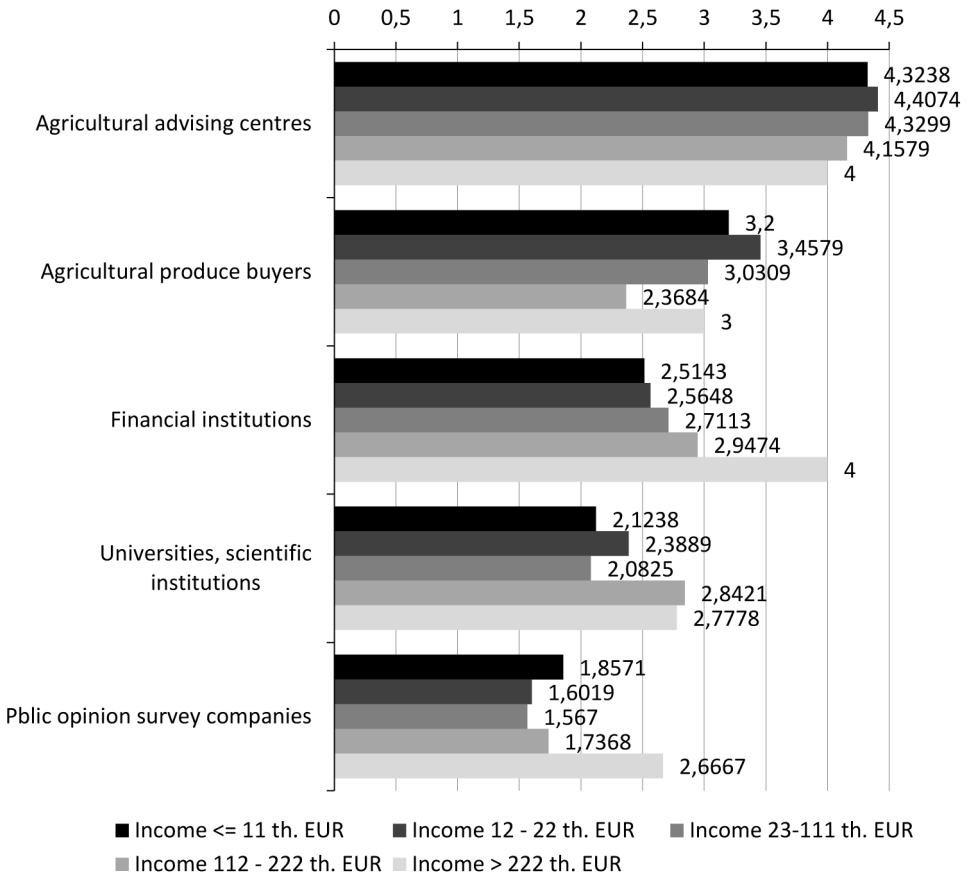

Source: own work.

From among the organisational traits of the farm, its size had the widest impact on the farmers' answers. Regarding the area of land farmed, statistically significant differences in answers were diagnosed for four information sources, while the income obtained influenced the evaluation of five of them (Figure 3).

Agricultural advising centres and agricultural produce buyers were given the highest notes among the farmers with a lower income (up to 100,000 PLN). These farmers gave relatively low notes to financial and scientific institutions as well as public opinion survey companies. These sources are more significant for the farmers with higher incomes (above 100,000 PLN).

Other organisational characteristics included in the questionnaire have a much smaller impact on the farmers' opinions on strategic information sources. Whether the farm

has a strategy and how formalised it is impacts on the evaluation of three sources: input suppliers, central government institutions and others. In case of the number of people working at the farm, a correlation was diagnosed for two sources: central government organs and financial institutions. Employment character, the type of agricultural activities and the existence of a vision of the farm, all influence the evaluation of one of the sources mentioned in the survey.

Figure 3. Evaluation of strategic information sources depending on the income obtained from agricultural produce sales

Source: own work.

Conclusion and recommendations

The farmers provided relatively low evaluations regarding the total use and significance of the strategic information sources included in the study for managing their farms. This low evaluation is reinforced by the fact that most answers given in the survey were below the arithmetical mean. Such a situation may indicate that information sources included in the study do not meet the expectations of Polish farmers. However, this hypothesis requires verification in a separate study.

The study showed that farms most often use and trust personalised strategic information sources the most. This result is similar to those obtained in the studies that have been conducted so far. It is noticeable that agricultural advising centres (advisers) have definitely the highest significance in Poland. This justifies the need of their further existence and development of advisory activities. Input suppliers and agricultural produce buyers were also evaluated above average. We can conclude that farmers trust their direct contractors and consider them a very important information source for strategic decision making. Among personalized sources only business information agencies were rated low by Polish farmers. Perhaps, it is due to the high price of these services and their relatively low popularity in Poland.

Farm managers gave rather low notes to publicly available institutional information sources. They decided that central and local government, banks and insurers as well as scientific and research institutions are not significant information sources for building a farm's strategy.

Agricultural market research and public opinion survey companies as well as business information agencies received the lowest notes. This means that farmers do not use their services and/or do not express the need of reaching information generated by them.

However, the high dispersion of the notes given should be taken into consideration while interpreting the results above. This lack of a strong opinion among the farmers indicates that the situation in this regard is very dynamic and may change. This means it will be justified to repeat and expand similar studies in the future.

Among the thirteen traits included in the survey, which could impact strategic information use by the farmers in ten cases a weak, a statistically significant correlation was detected between the factor in question and evaluation of at least one of the source's significance. All diagnosed dependences concern new factors in comparison to previous findings.

From four individual (sociological) traits of the farmer, only sex slightly determined evaluation of one of the sources. The widest impact was observed for external factors of the farm (resulting from its environment). This applies especially to the geographical location of the farm and the population of the settlement in which it is located. Thus, northern and central Poland evaluated relatively higher such information sources as input suppliers, local government, the chamber of agriculture and financial institutions. The farmers from southern Poland evaluated the significance of central government and sources other than those mentioned in the survey higher than others. There is also a noticeable tendency of the farmers' evaluating the significance of non-personalised sources (local government, financial institutions and central administration) higher along with the increasing size of the settlement where the farm is located. In smaller villages, personalised sources (input suppliers and agricultural produce buyers) received higher notes.

The farm organisation factors have a lesser impact on the evaluation of source significance. The widest influence was observed for farm size, measured by its income. This influences the evaluation of five sources. The farmers managing higher-income farms typically evaluate non-personalised sources (financial institutions, scientific institutions, public opinion research companies) higher than others. Personalised sources (agricultural advisers and agricultural produce buyers) are more significant for lower--income farms.

The low strength of the diagnosed correlations and also the rather small group of factors included in the study which may influence strategic information source evaluation, mean that the study should be considered introductory in this regard. However, it provides a good basis for preparing studies based on a wider research sample, considering a larger number of factors.

The above findings will be used by the authors in the next phase of the research to build a theoretical model of acquiring relevant strategic information for Polish farmers. The improvement of that model and its equipment in the proper techniques and tools can form the basis of a strategic information system for application in the agriculture sector.

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Attachment 1. The influence of selected farmer's characteristics on the strategic information source evaluations provided

Information source / Trait	Agricultural advising centres	Input suppliers	Agricultural produce buyers	Local government	Chamber of agriculture	Financial institutions	Central government	Universities, scientific institutions	Specialised research companies	Public opinion survey companies	Business information agencies	Other
Age												
Chi² emp.	9.2934	13.9256	10.7875	5.3037	8.9620	12.6821	11.2115	17.6724	9.9055	4.0900	19.7557	5.2949
P-value	0.6777	0.3055	0.5472	0.9471	0.7062	0.3926	0.9471	0.1260	0.6243	0.9054	0.0719	0.9474
T-Chuprov	0.0891	0.1091	0.0960	0.0673	0.0875	0.0635	0.0979	0.1229	0.0920	0.0635	0.1299	0.0672
C-Pearson	0.1636	0.1989	0.1759	0.1243	0.1607	0.1093	0.1792	0.2229	0.1687	0.1093	0.2350	0.1242
Education												
Chi² emp.	25.8001	19.3218	20.5222	18.5362	17.0960	26.5398	28.5326	25.7340	16.6821	9.3992	13.4202	18.9051
P-value	0.1726	0.5010	0.4257	0.5521	0.6467	0.1488	0.0974	0.1748	0.6735	0.8557	0.8586	0.5280
T-Chuprov	0.1306	0.1131	0.1165	0.1107	0.1063	0.1325	0.1374	0.1305	0.1051	0.0847	0.0942	0.1118
C-Pearson	0.2663	0.2325	0.2393	0.2280	0.2194	0.2698	0.2790	0.2660	0.2869	0.1645	0.1954	0.2302
Sex – 1												
Chi² emp.	9.8127	8.4353	7.3063	10.8899	5.5955	5.4688	7.2402	2.5092	1.2862	1.5230	1.3079	8.7452
P-value	0.0437*	0.0769	0.1206	0.0278*	0.2315	0.2425	0.1237	0.6430	0.8637	0.6770	0.8600	0.0678
T-Chuprov	0.1205*	0.1117	0.1040	0.1269*	0.0910	0.0899	0.1035	0.0609	0.0436	0.0510	0.0440	0.1137
C-Pearson	0.1680*	0.1560	0.1455	0.1767*	0.1276	0.1262	0.1448	0.0958	0.0616	0.0670	0.0621	0.1588
Experience in farming												
Chi² emp.	5.9447	7.9092	11.9404	8.0974	14.8594	8.4064	12.7075	2.7189	8.1337	4.7931	10.3043	1.2444
P-value	0.6534	0.4424	0.1539	0.4240	0.0600	0.3948	0.1223	0.9507	0.4205	0.5706	0.2443	0.9962
T-Chuprov	0.0789	0.0910	0.1118	0.0920	0.1251	0.0938	0.1153	0.0533	0.0922	0.0761	0.1038	0.0360
C-Pearson	0.1315	0.1512	0.1847	0.1530	0.2059	0.1558	0.1904	0.0893	0.1533	0.1182	0.1720	0.0606

* – weak correlation, ** – moderately strong correlation, *** – strong correlation.

Source: own work.

Attachment 2. The influence of selected farm's characteristics on the strategic information source evaluations provided

Information source	Agricultural advising centres	Input suppliers	Agricultural produce buyers	Local government	Chamber of agriculture	Financial institutions	Central government	Universities, scientific institutions	Specialised research companies	Public opinion survey companies	Business information agencies	Other
Trait	**Geographical location (region) – 7**											
Chi² emp.	20.0356	22.8074	17.2410	36.5985	24.5309	27.6283	80.6429	22.8481	16.6435	9.5267	18.3247	32.7383
P-value	0.0664	0.0294*	0.1408	0.0026*	0.0172*	0.0062*	0.0000*	0.0291*	0.1635	0.3902	0.1062	0.0010*
T-Chuprov	0.1308	0.1396*	0.1213	0.1768*	0.1447*	0.1536*	0.2624*	0.1397*	0.1192	0.0969	0.1251	0.1672*
C-Pearson	0.2366	0.2514*	0.2203	0.3125*	0.2601*	0.2749*	0.4389*	0.2516*	0.2166	0.1656	0.2268	0.2972*
Factor	**Settlement's population – 5**											
Chi² emp.	19.4295	21.8447	34.0434	40.0241	15.3603	33.7686	45.9553	11.4387	15.9720	11.9881	10.8226	13.1488
P-value	0.0787	0.0393*	0.0007*	0.0001*	0.2223	0.0007*	0.0000*	0.4918	0.1925	0.2140	0.5442	0.3583
T-Chuprov	0.1288	0.1366*	0.1705*	0.1849*	0.1145	0.1698*	0.1981*	0.0988	0.1168	0.1087	0.0961	0.1060
C-Pearson	0.2332	0.2464*	0.3025*	0.3254*	0.2085	0.3014*	0.3460*	0.1809	0.2124	0.1851	0.1761	0.1935
Trait	**Farm area – 4**											
Chi² emp.	37.6432	14.9104	26.9168	32.2921	9.1846	27.6524	21.1724	15.8078	19.5052	9.6724	11.8959	14.0319
P-value	0.0017*	0.5312	0.0424*	0.0092*	0.9056	0.0348*	0.1720	0.4665	0.2246	0.6447	0.7511	0.5963
T-Chuprov	0.1669*	0.1050	0.1411*	0.1545*	0.0824	0.1430*	0.1251	0.1081	0.1213	0.0909	0.0938	0.1018
C-Pearson	0.3166*	0.2464	0.2716*	0.2953*	0.1626	0.2750*	0.2428	0.2113	0.2358	0.1668	0.1844	0.1997
Trait	**Income level – 5**											
Chi² emp.	31.1068	14.5576	34.2184	17.7914	11.4596	26.4241	17.5729	26.7238	22.0426	23.2796	22.0893	7.7449
P-value	0.0131*	0.5573	0.0051*	0.3363	0.7803	0.0484*	0.3495	0.0447*	0.1419	0.0255*	0.1404	0.9561
T-Chuprov	0.1517*	0.1038	0.1591*	0.1147	0.0921	0.1398*	0.1140	0.1406*	0.1277	0.1410*	0.1278	0.0757
C-Pearson	0.2903*	0.2032	0.3032*	0.2236	0.1811	0.2693*	0.2223	0.2707*	0.2474	0.2538*	0.2477	0.1497

Type of dominant activity — 1

Trait												
Chi² emp.	12.7666	17.0869	24.8223	31.0064	20.5190	11.4453	9.6009	15.4089	19.3607	10.6111	11.6071	10.4042
P-value	0.6897	0.3800	0.0730	0.0134*	0.1978	0.7812	0.8866	0.4949	0.2504	0.5625	0.7706	0.8447
T-Chuprov	0.0972	0.1124	0.1355	0.1514*	0.1232	0.0920	0.0843	0.1068	0.1197	0.0952	0.0927	0.0877
C-Pearson	0.1908	0.2194	0.2616	0.2899*	0.2392	0.1810	0.1662	0.2088	0.2328	0.1745	0.1822	0.1728

Kind of employment — 1

Trait												
Chi² emp.	28.9801	14.7489	3.1439	18.4836	10.0756	19.5874	18.1507	8.4033	14.3616	8.5227	8.0153	3.1439
P-value	0.0040*	0.2555	0.9944	0.1018	0.6093	0.0753	0.1112	0.7529	0.2764	0.4826	0.7839	0.9944
T-Chuprov	0.1573*	0.1122	0.0518	0.1256	0.0928	0.1293	0.1245	0.0847	0.1109	0.0917	0.0827	0.0518
C-Pearson	0.2810*	0.2045	0.0960	0.2277	0.1701	0.2340	0.2258	0.1558	0.2021	0.1568	0.1522	0.0960

Number of employees — 2

Trait												
Chi² emp.	18.7937	10.9777	17.0156	17.9284	11.1073	26.6695	24.2502	12.8124	19.4958	12.0525	6.8778	1.4924
P-value	0.0937	0.5308	0.1490	0.1179	0.5198	0.0086*	0.0188*	0.3828	0.0772	0.2104	0.8656	0.9999
T-Chuprov	0.1267	0.0968	0.1206	0.1237	0.0974	0.1509*	0.1439*	0.1046	0.1290	0.1090	0.0766	0.0357
C-Pearson	0.2295	0.1774	0.2189	0.2244	0.1784	0.2704*	0.2587*	0.1911	0.2335	0.1856	0.1412	0.0663

Farm vision — 1

Trait												
Chi² emp.	23.3301	20.0743	16.3702	7.9047	18.1471	14.5960	16.1384	11.2353	7.9106	2.2168	5.8372	9.2999
P-value	0.0251*	0.0657	0.1749	0.7925	0.1113	0.2643	0.1850	0.5089	0.7921	0.9876	0.9241	0.6771
T-Chuprov	0.1412*	0.1309	0.1182	0.0822	0.1245	0.1117	0.1174	0.0980	0.0822	0.0468	0.0706	0.0891
C-Pearson	0.2541*	0.2368	0.2149	0.1511	0.2253	0.2035	0.2135	0.1794	0.1512	0.0807	0.1303	0.1636

Farm strategy — 3

Trait												
Chi² emp.	12.4016	41.3014	14.8211	15.6110	16.3581	19.1938	29.9494	11.2353	20.9373	11.0747	16.3961	33.2934
P-value	0.7159	0.0005*	0.5378	0.4804	0.4283	0.2588	0.0183*	0.5089	0.1810	0.5225	0.4257	0.0068*
T-Chuprov	0.0958	0.1748*	0.1047	0.1075	0.1100	0.1191	0.1488*	0.0980	0.1244	0.0973	0.1101	0.1569*
C-Pearson	0.1881	0.3300*	0.2050	0.2101	0.2149	0.2318	0.2853*	0.1794	0.2415	0.1781	0.2151	0.2994*

* – weak correlation, ** – moderately strong correlation, *** – strong correlation.

Source: own work.