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ROLE AND IMPORTANCE OF LOGISTICS FACILITIES IN THE FRUIT FARMING

Abstract:

Constructing a building that includes a sorting hall, cold stores, hygiene and sanitary facilities and required additional infrastructure is a serious project that has to take into account the provisions of construction law, architectural and construction requirements and principles of the art of construction. A key issue is also cooperation with the general contractor during the whole investment process. When developing a design of a logistics facility the most important thing is to choose appropriate technology to build it. Since building a masonry building – so far most often used technology – takes a long time, investors more and more often use steel or reinforced concrete constructions encased with bonded panels. This technology makes it possible to complete a building in a shorter time, which enables an investor a shorter payback period. Both during designing logistics facilities and choosing finishes mistakes are made, connected in particular with the introduction of systems for food quality and safety, such as: GMP, HACCP, BRC and IFS.

With Poland's accession to the European Union Polish fruit farmers gained access to a large EU agricultural budget, which led to the establishment of producer groups whose importance in terms of the construction of logistics facilities in the sector of fruit farming in Poland should be highlighted. Producer groups can lower production costs and improve the attractiveness of the offer. A producer group, in order to start its operation, needs its own logistics centre. In the current economy, it is not production of goods, but their sale that is a problem. Construction, development or modernisation of storage facilities and storage and sorting halls, especially with support from the EU, enables technological and quality progress in terms of storage and preparation of fruit for sale, which is both a requirement and a big chance for the Polish fruit farming.

Keywords:

logistics facility, technology, infrastructure, Polish fruit farming, quality systems

JEL Classification: R40, L91

Introduction

Logistics, along with such concepts as business or marketing, is a symbol of deep social and economic changes, that have been stimulating the turbulent development of market economy since the second half of the 20th century. The position and dominating impact of logistics on economic activity is confirmed by Pisz, Sęk and Zieleck [2013]: "...in order to effectively compete and survive on the market, it is necessary to transform an enterprise into a logistics-oriented organisation; this means that an enterprise has to undergo change as a result of which it will focus on processes rather than functions..." In highly developed countries, it is estimated that logistics costs [Rokicki and Wicki, 2011, pp. 634-646]. account for 20-40% of costs in enterprises on average, of which, according to [Michałowska, 2013, pp. 325-334], 40-50% are costs of physical flows, 30-40% – costs of stocks, and 15-20% – costs of information processes.

Scientific theories formulated within the field of logistics make it possible to identify and classify costs using any theoretical criteria [Nowicka-Skowron, 1999, pp. 17-19]. Much bigger problems occur in practice, when it is necessary to establish the amount and structure of logistics costs for enterprises operating in the fruit farming industry. This is due to lack of accurate registry and reporting systems in the area of actual costs of logistics processes [Nowakowska-Grunt, 2011, pp. 291-300].

Sales of various products, including those from horticultural farms, is increasingly concentrated in retail or discount store chains. The number of such entities is small compared to the number of potential suppliers, therefore competition for space on a store shelf is increasing. Retail chains, which are strengthening their position on the market, can enter into cooperation with producer groups. Thanks to the possibility of co-financing investments to build and equip logistics centres, as well as determination of the boards of directors of producer groups, we can see facilities similar to those built in Western Europe a few year ago emerging also in Poland. New investments are made both in emerging producer groups and those operating on the market for a few years to allow these companies to cooperate with increasingly demanding customers. Construction of a logistics centre should be thoroughly planned, so that it could be expanded in the future, and the technology used in this process should meet the requirements of certificates confirming the quality and safety of offered products. In order to avoid mistakes, before starting the construction works, it is worth learning about experiences of other entities that have implemented such investments in the country or abroad. The aim of the paper is to present, based on literature of the subject and research, the place and role of logistics facilities in the functioning of a producer group, with special reference to the fruit farming industry.

Role and tasks of logistics infrastructure

Performance of logistic processes requires a certain infrastructure consisting of livestock buildings, warehouse buildings, technical production means and computerised means.

The technical infrastructure of logistic processes includes [Kuboń, 2011, pp. 30-33]:

- production buildings and warehouse facilities, where stocks can be stored and protected, and technical means of operation and internal transport,
- means of transport and equipment used for transferring products across the different links of a logistic chain,
- computerised means (telephone, fax, computer) used for acquiring, processing and gathering necessary information in logistic processes,
- packaging, which serves protection, storage, transportation and recycling functions.

Flows of materials, raw materials and finished products, as well as accompanying information streams, are the subject of logistics. Performing basic logistic tasks, such as: material requirements planning, stocks control, transport organisation, warehousing or sales organisation, is not possible without thorough analysis of the level and structure of the flows of raw materials and goods in agricultural holdings [Wicki et al., 2014]. The degree of complexity of these flows in agricultural enterprises is a function of their size and character of activity, value of production and sales, degree of production complexity, and above all - spatial scope of the economic activity [Rokicki, 2013, pp. 293-303]. A survey [Szeląg-Sikora and Sikora, 2014, pp. 288-292] showed significant differences among the groups of agricultural holdings surveyed in terms of the size and structure of tangible goods.

The reasonableness and necessity of possessing an appropriate warehousing infrastructure in an agricultural holding were confirmed in studies [Pawlak and Wróblewska, 2014, 224-229] in which special attention was paid to places where "buffers" were created in logistic chains. It is necessary to maintain stocks, mainly to ensure continuity of production processes, sales continuity, protection against changes in prices, and to maintain the quality of produced agricultural produce [Majewska and Klibisz, 2012, 425-435]. Research [Domagalska-Grędys, 2014, pp. 167-177] shows that in agricultural holdings specialising in fruit and vegetable growing, 86.3% of commodity production is warehoused in distribution processes for 5 months on average, with only 13.7% being sold directly after the harvest time. A detailed analysis of storage capacity and its use was presented in the work [Kuboń and Kurzawski, 2012, pp. 203-213], which shows that the groups of farms analysed used from 65.3% to 88.6% of their storage capacity. Silos, warehouses and storehouses were the most often used elements of the warehousing infrastructure, whereas livestock buildings were least often used.

In the process of agricultural production, like in every production process, it is necessary to move various loads [Mrówczyńska-Kamińska, 2014, pp. 47-54]. These are mainly means of production (own or purchased) and agricultural produce as a result of the activity of agricultural holdings. Efficiency of the flows of raw materials and goods in agricultural enterprises depends mainly on whether farms are appropriately equipped with technical means of production in the form of transportation means and equipment, which are part of the logistic infrastructure [Domaradzki, 2012, pp. 197-209]. Nowadays, the means of transport possessed by

agricultural enterprises represent a significant part of their fixed assets due to the role fulfilled by transport in an agricultural holding, which is called a "transport enterprise against its will" [Pawlak, 2012, pp. 45-56].

Specific features of agricultural production – i.e. spatial character, seasonality, diversity of obtained products, quality of agricultural roads, etc. – require that an agricultural holding possesses various, sometimes specialist, means of transport. On the other hand, possession of such a diverse equipment is connected with incurring high costs of its maintenance and use [Szelać-Sikora and Oleksy-Gębczyk, 2013, pp. 341-351]. Therefore, a decision about possession of transportation means or equipment should be based on costs, which depend mainly on their use [Klepacki, Wysokiński and Jarzębowski, 2013, 25-27]. It is thus necessary to specify the number and type of transportation means which, without causing excessive costs, will guarantee an efficient implementation of logistic processes.

Taking into account the discussion above, it should be noted that the implementation of logistic processes is impossible without appropriate logistic infrastructure. Such infrastructure should ensure that the basic functions of logistics, i.e. flow of goods, protection of stocks and finished goods, information gathering and processing and appropriate management of packaging, are performed in an efficient and cost-effective way. In order to implement these processes, it is necessary to incur certain costs, referred to as costs of logistic infrastructure.

Role of producer groups in the Polish fruit farming industry

New chances for the development of the different areas of the economy and social environments that emerged after Poland joined the European Union make it necessary to find such solutions that will use possessed resources in the most effective way. The period of transformation connected with the implementation of market mechanisms in the economy made the situation of rural area population significantly worse. It saw an increase in the open and hidden unemployment rates as well as in the disproportions in incomes of urban and rural populations. This unfavourable situation can be changed by the development of entrepreneurship [Sobierajewska and Ziętara, 2013, pp. 140-151]. Agriculture in particular is experiencing difficulties in adaptation to new challenges resulting from the integration process. Its main problem is the fact that agricultural holdings are too small, which leads to a small scale of production and limited economic effects [Kotala, 2003]. Polish rural areas are definitely specific, which means that it is necessary to use significant labour force in a more effective way. Faced with limited access to urban labour market and few offers of employment at the local level, rural population, not seeing prospects for small agricultural holdings, are looking for other sources of income [Kotala, 2004, p. 29]. Such an alternative source of income may be entrepreneurship in the form of organised cooperation, such as emerging producer groups.

The social and economic reforms in Poland have radically changed farming conditions. Competition on the domestic market, which increased as a result of

Poland's becoming open to foreign markets, revealed the need for deep restructuring of agricultural holdings so that they could meet new requirements. There is a belief that a way out of this situation is multifunctional development of rural areas, stimulation of rural entrepreneurship and increasing economic activity of farmers. Strategies [Romanowska, 2013, pp. 197-203] for the development of rural areas and agriculture assume revitalisation of entrepreneurship in the widest scope possible. Apart from the support from state, self-government and financial institutions, it is expected that rural population themselves will show entrepreneurship, which will cause growth of agricultural activity and allow increased material benefits to be achieved. Undoubtedly, even the best government policy cannot give expected effects without the involvement of enterprising people [Mickiewicz, 2014, pp. 135-140].

The last decade saw a significant increase in the number of economic entities operating in rural areas. The development of small and medium-sized business is much slower in rural areas than in cities, mainly due to barriers that make it difficult to set up and run a non-agricultural business activity, i.e. such external and internal conditions of the business environment that weaken the dynamics of formation of new enterprises, reduce the possibilities of development of existing companies or speed up the collapse of small businesses [Ratajczak, 2013, 628-637].

The organisational and legal efforts made in recent years to propagate common activities have already brought certain practical effects, but the scale of interest of agricultural producers in collaborative forms of cooperation seems insufficient. Thus, the main reasons for observed low activity of rural community in the area of entrepreneurship include [Ziętara, 2014, pp. 257-262]:

- weakness of the external environment, which is supposed to support the establishment and running of small and medium-sized enterprises,
- low level of integration and coordination of support programmes, and their strong division into sectors,
- focus of programmes for activation of the unemployed on quantity, not quality, and their bureaucracy,
- insufficient actions that could effectively release the endogenous potential of rural population,
- promotion of solutions that are not always adapted to the real needs of rural population, especially people located in the peripheries of large cities.

The term "Producer Group" is defined and understood in a number of different ways, but in the simplest terms it is a group of farmers that act together to increase their incomes and improve the market position of their farms. The way such a group can achieve its goal depends on accepted legal form, as a producer group is not a legal form, but a collective term for different legal forms that such groups can take. Legal forms taken by producer groups include: limited liability company, cooperative or association [Fałkowski, Łopaciuk-Gonczaryk, and Chlebicka. 2014, 137-156].

Certification process

Since the beginning of the 1950s people in the West have been paying attention to the quality of food. There is no doubt that in the near future the process of certification of fruit farmers and producer groups will increase, regardless of whether or not the HACCP system or any other system for food quality security will be obligatory in fruit farming. Competition on the fruit market and increased awareness of consumers cause retailers to start to demand certificates from their suppliers. Enterprises without modern standards in place may have no option but to gradually close, be absorbed by larger and certified entities or to look for smaller and less demanding outlets. Thank to the implementation of IFS or BRC standards, a fruit farmer or a fruit producer group can have better relationships with customers and stabilise their position on the domestic and foreign markets [Kondratowicz-Pozorska, 2014, pp. 108-116].

A breakthrough in the production of safe food was initiated by NASA and Pillsbury Company. Americans created the HACCP system (Hazard Analysis and Critical Control Points), because they had to be sure when sending humans into space that the food would be safe for astronauts. The pressure was mainly put on prevention of the occurrence of potential irregularities. For that purpose, the whole production chain was subject to control, not only the finished product. With time, the food sector had new safety systems, which now are more and more often required also from Polish fruit producers who cooperate with chain stores in the country and abroad [Werpachowski, Kowalska and Żbikowska. 2013, pp. 50-60].

The effectiveness of the HACCP system was confirmed by the regulation of the European Commission about food hygiene 852/2004, as a result of which HACCP became a system required by law in all enterprises operating in the EU along the whole food chain (production, transport, trade and distribution, gastronomy), excluding the basic agricultural production (e.g. fruit packing). However, the HACCP system is responsible only for food safety, not its quality. This problem was noticed in the early 1990s by British food processing plants and food producers, who were controlled by each buyer [Czernyszewicz and Pawlak, 2012, pp. 114-132]. Often, there were several audits in a month in one plant, and a fruit producer or a producer group had to meet the preferences of each individual customer (fig. 1).

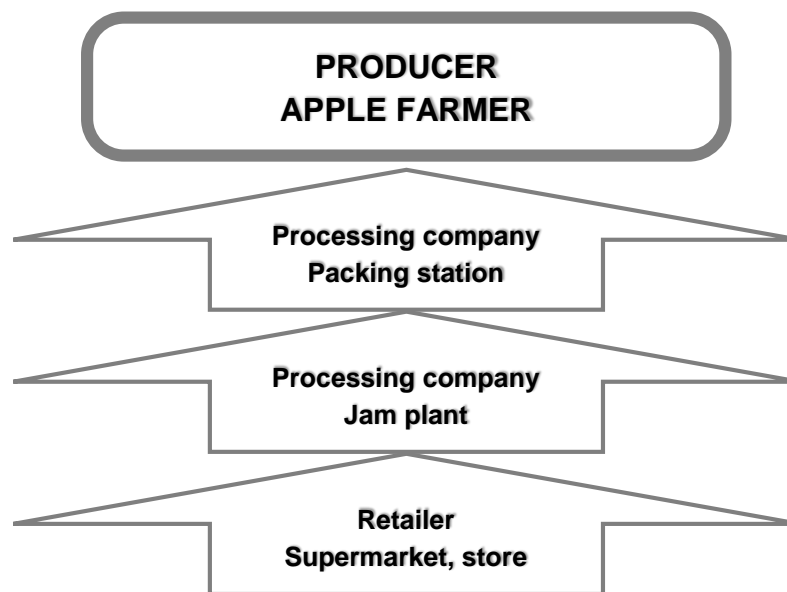


Fig. 1. Direction of conducting audits

In 1998, a new standard called British Retail Consortium (BRC) emerged in the food production, which was to a large extent based on ISO 9000 and HACCP. It replaced costly, multiple audits by one, conducted by an independent entity recognised by everybody (fig. 2). A certificate obtained as a result of such an audit became an indication of quality of a given food producer. Since 1998, the BRC standard has already been changed a few times and the current version is BRC 5 from 2008 [Berdowski, 2012, pp. 39-48].

An audit conducted by a certification entity eliminated controls between contractors.

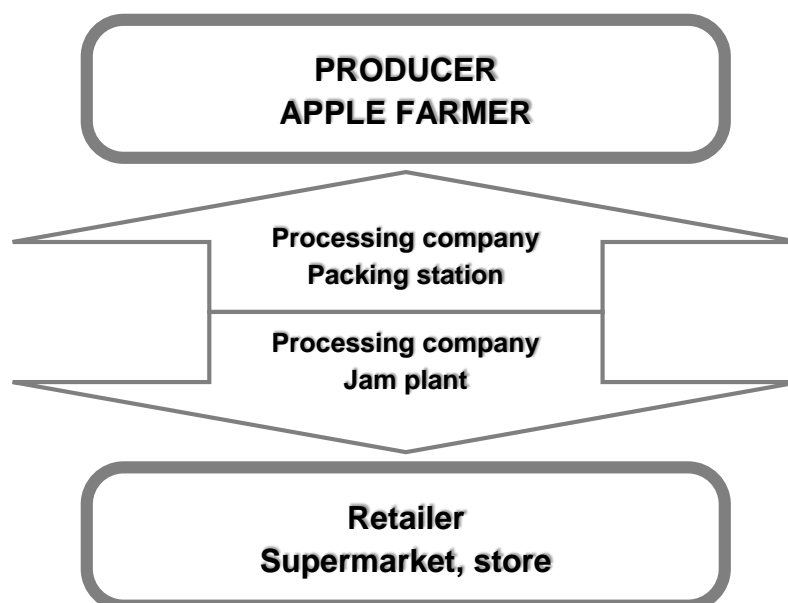


Fig. 2 An audit conducted by an independent entity recognised by everybody

Observing positive results of the British Retail Consortium, the German federation of suppliers Hauptverband des Deutschen Einzelhandels (HDE) along with its French counterpart, Fédération des Entreprises du Commerce et de la Distribution (FCD), created a new system for food safety and quality called International Food Standard (IFS).

Both these standards are widely used in the food industry. In the fruit farming, the process of sorting, packing and classifying fruit, e.g. apples or pears, is subject to certification. The primary production in an agricultural holding can be certified by mean of the GlobalGap standard [Czernyszewicz and Pawlak, 2012, pp. 114-132].

For a fruit farmer, there are not many differences between BRC and IFS standards, because the originators of both these systems were striving to achieve the same objective. One of the differences is the final result of the audit and level of the certificate. In the BRC standard, the result is a grade from A to D, with the standard being awarded for A and B results, and the next audit conducted in 12 months. With grade C, the revisit of an auditor will take place after 6 months. Grade D means that a certificate will not be awarded. In the event of discrepancies with the system, the company being audited should present corrective measures within 28 days.

In the IFS system, the assessment is more detailed and depends on the percentage fulfilment of specific requirements of the system. A certificate is awarded at two levels: higher and basic one. A company is given only 14 days from receiving an initial report to act and present a plan for corrective measures.

Both the systems for ensuring food safety and quality focus on similar issues in the following areas [Czernyszewicz, 2009, pp. 79-93]:

- The HACCP system implemented in accordance with the 7 principles of Codex Alimentarius;
- Documentation (quality book, procedures, records, supervision over the documentation);
- Responsibilities of the management and board of directors of a company in the area of the implementation, assessment and improvement of the system;
- Control of processes (e.g. time/temperature monitoring, control of the measuring equipment);
- Product control (laboratory control, requirements regarding product packaging, the "use by" date, turnover of stocks, protection against physical contamination, release of batches for sale, handling of a non-complying product);
- Requirements concerning the plant and its environment (implementation of GMP/GHP principles, requirements regarding the flow of raw materials, products, people, preparation of buildings, production halls and equipment, conducting technical inspections, implementation of cleaning schedules, methods of waste elimination, control of pests, conditions of the transportation of raw materials and finished products);
- Human resource management (requirements concerning the hygiene and health of the staff, training courses and qualifications).

Both individual fruit farmers and those united in producer groups can apply for this standard. In the latter case, the standard will be profitable, if the minimum size of an agricultural holding is several tens of hectares. It is usually large companies that focus on or act as an agent in trade with large store chains in Western Europe that apply for certification of BRC or IFS standards (fig. 3).

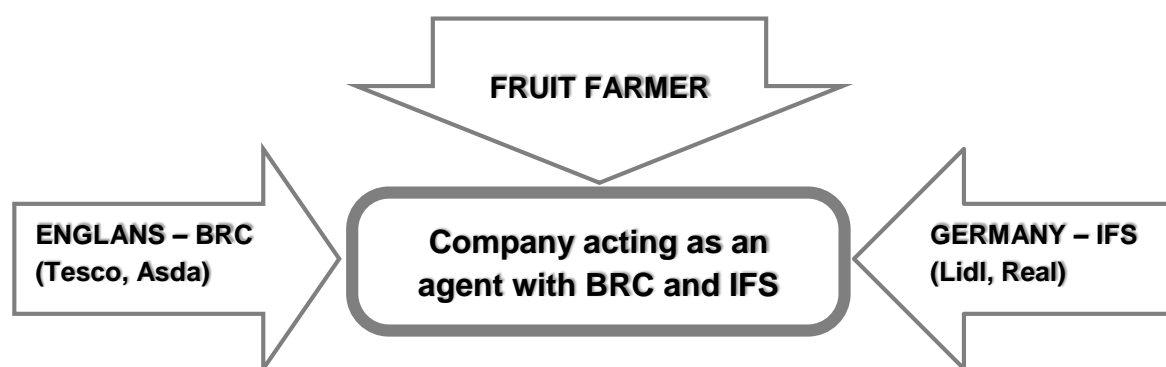


Fig. 3. System of fruit sale to the West

After Poland joined the EU, neither Polish fruit farmers or those from Western Europe had to implement the HACCP system in their agricultural holdings, as agriculture and fruit farming are qualified as the basic agricultural production which covers not only the process of fruit production itself, but also its packing and sorting. Since 15 September 2000 (when the act on agricultural producer groups and their associations came into effect), Polish fruit farmers have started to see a chance in producer groups. This trend has continued to this day, as the conditions that have been created encourage the use of EU funds, among other things, thanks to partial reimbursement of eligible costs incurred by an entrepreneur. Many producer groups benefited from this programme, building packing stations, sorting plants and fruit storage facilities or buying machines and equipment or means of transport. Some groups and fruit farmers spent the money they saved on the implementation and certification of GlobalGap, BRC or IFS standards, bypassing thereby costly agents [Lubańska, 2010, pp. 147-157].

The implementation of these systems in practice involves preparation of required documentation, which depends on the size of the company and production scale. The person responsible for preparing appropriate procedures, instructions and forms of records, called Representative for Quality Assessment, should have experience in the HACCP system and understand the principles for developing specific risk analyses. In the horticulture production, the latter refer to basic threats of chemical origin (e.g. plant protection products, preparations for washing and maintaining hygiene in a plant, migration of chemical substances from packaging to a finished product), physical origin (e.g. contamination with wood or metal) and biological origin (e.g. quality of water used for water unloading, hygiene and health of the staff).

Summary

The functioning of a producer group focused on fruit production as a form of entrepreneurship in rural areas confirms that cooperation brings measurable effects in the form of sale increase and implementation of investments, among other things. Such a group actively obtains EU subsidy, which allows it to make investments to improve the quality of its production. An intangible effect of such cooperation is undoubtedly increase in professional activity of the group members, which is reflected in enterprising behaviour during attempts to increase work effectiveness in their own agricultural holdings as well as creative ideas and innovative activities.

Keeping records of the control of processes and products takes time and requires regularity. In modern fruit farming companies, most of such records are created automatically by advanced computer systems, which control parameters (e.g. temperature or weigh of packed finished product) and monitor the origin of a product and production date written by means of bar codes. Naturally, it is sufficient to manually write down the most important information in reports for given days of production. In the case of production of fresh, unprocessed fruit, maintaining food safety, if appropriate requirements are met, should not be a huge problem, as fruit does not belong to high risk product category. In the case of BRC and IFS standards, which apart from food safety also highlight the obligation to continuously improve processes and product quality, difficulties may occur during assessment of the latter parameters. It is conducted by means of an analysis of complaints, internal audits of the different departments, by drawing constructive conclusions to avoid the same mistakes and by systematic involvement of the management in reviewing how the company is managed.

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