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ECOLOGICAL ENTREPRENEURSHIP IN WINE-PRODUCING MICRO-ENTERPRISES IN THE LOWER SILESIA VOIVODESHIP

This article attempts to determine the conditions of ecological entrepreneurship in micro-enterprises producing wine in the Lower Silesian Voivodeship. Currently, the implementation of pro-environmental ideas in local enterprises is of great importance. This is particularly important for micro-entrepreneurs, whose share of GDP in this region is the highest in Poland. The wine industry is deserving of attention because the number of producers has increased greatly in recent years (including in the Lower Silesian Voivodeship). In addition to a literature review, the article will present the results of the author's own doctoral research on determining the conditions and manifestations of local entrepreneurship in the Lower Silesian Voivodeship on the example of wine production.

Keywords: ecological entrepreneurship, micro-entrepreneurship, wine production, Lower Silesian Voivodeship

1. INTRODUCTION

Currently, more and more attention is paid to foods with high sensory and health-promoting values. These are mostly products produced on a small scale by local producers. Producing local food and selling it in the region brings many opportunities and benefits. This production has an additional impact on the competitiveness of the region, e.g. thanks to paying attention to the uniqueness and quality of products and promoting the idea of sustainable development by entrepreneurs (Fitzgerald, 2016).

Among the many products produced locally, the developing wine production in Poland deserves a special mention. It is a product that is increasingly noticed and chosen by consumers. However, sensory, cultural and social values are important when choosing it. The quality of the wine depends mainly on the grape variety used, while the factors determining the qualities of the obtained raw material include, among others, suitable soil and climate. Among these elements, it is the grape variety that primarily determines the identity of the wine. Due to the multitude of factors affecting the quality of wines, they should not be defined as national. High-quality wines should be identified with the region, town or vineyard (Tuszyński, Poreda, 2003).

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In Poland, it is best to grow grapes in regions with a warm climate. These include places located in the first climatic zone – the Opolskie, Lubuskie and Lower Silesian Voivodships. The author's interest focused on the area of the Lower Silesian Voivodeship, which is little known for wine production, and is characterized by a warm climate with the highest temperatures in the country throughout the year and soils rich in nutrients. The Lower Silesian Voivodeship is an area with a varied topography and landscape suitable for planting vineyards (Grykień, 2009).

Currently, there are more and more entities wanting to produce wine for sale. In 2011, there were 26 registered vineyards in Poland. In 2022, there were already 380 of them (Krajowy Ośrodek Wsparcia Rolnictwa, 2023).

All the above-mentioned characteristics shaping the running of a vineyard in the Lower Silesian Voivodeship will influence the entrepreneurs' decision to implement eco-entrepreneurship as part of their activities. The conditions of running a vineyard according to the assumptions of the idea of sustainable development have therefore become the subject of research in this work.

2. LITERATURE REVIEW

2.1. Entrepreneurship and ecological entrepreneurship

In order to better look at the issue of ecological entrepreneurship, attention should be paid to how the phenomenon of entrepreneurship is defined. Due to the multidimensionality of this concept, no single coherent definition has been developed. Entrepreneurship can be perceived in different ways – taking into account the context of a person, group or institution. This creates the possibility of interdisciplinary treatment of this term, which has some advantages, but also disadvantages. On the one hand, the lack of terminological consistency may hinder further development of the analyzed phenomenon, and on the other hand, it gives the opportunity to create various concepts. Many possibilities of defining entrepreneurship allow to state that this concept should be systematically systematized and classified (Gąsiorowska-Mącznik, 2017).

In the case of ecological entrepreneurship, it should also be related to the characteristics of the entrepreneur, the actions taken by him and the process itself. In some perspectives, it is also called “green” entrepreneurship (Seroka-Stolka, 2012). Selected characteristics of the described phenomenon of entrepreneurship are presented below (Table 1).

The definitions presented in Table 1 show many similarities. They focus primarily on pro-ecological activities to protect the natural environment. Kochel (2013) also indicates ecological entrepreneurship, which is an entrepreneurial activity taking into account the benefits for the natural environment. The author describes that entrepreneurs often use ecological forms of doing business to promote their own brand. As a result, in the production of food, special attention is paid to the high quality of the harvest, the pro-health qualities of the food produced and pro-environmental behavior in the company. This can be achieved e.g. thanks to the use of natural preparations in plant cultivation (also in the case of vines and grapes) – biostimulators (Filipczak et al., 2016). These are biological substances containing various components necessary for plants, e.g. amino acids, humic substances, extracts from sea algae, chitosan, vitamins, phytohormones and beneficial fungi and bacteria. They are to stimulate the growth and development of roots, leaves or flowers and improve the absorption of essential nutrients. In addition, they increase the tolerance to adverse environmental conditions (Czarnecka, 2017).

Table 1. Selected approaches describing ecological entrepreneurship in organizations

Author, year	Definition of ecological entrepreneurship
Chodyński, 2009	It is an entrepreneurial activity for the benefit of the natural environment. The implementation of ecological activities of commercial organizations should take into account the regulatory influence of the state, the pro-ecological influence of the market and relying on ecological values professed by consumers.
Huczek, 2010	In the literature, the concept of ecological entrepreneurship was formulated as entrepreneurial activity for the benefit of the natural environment. It is indicated that the implementation of the organization's entrepreneurial activities should take into account the regulatory impact of the state, the pro-ecological impact of the market and relying on ecological values professed by consumers.
Seroka-Stolka, 2012	A pro-ecological business model that takes into account the approach related to ecological responsibility can be built using four basic components, which include: strategic choices, value networks, value creation and value acquisition.
Kochel, 2013	Ecological entrepreneurship is an entrepreneurial activity taking into account the benefits for the natural environment. The author points out that entrepreneurs often use eco-friendly business to promote their own brand.

Source: own study based on: (Chodyński, 2009; Huczek, 2010; Seroka-Stolka, 2012; Kochel, 2013).

In addition, more and more attention is paid to the fact that the implementation of entrepreneurial activities should take into account pro-ecological activities in companies. In addition, it is important to implement the ecological values professed by consumers, because they are the ones who choose ecological products or not (Huczek, 2010).

2.2. Ecological entrepreneurship in local wineries

As of 2021, wine trends increasingly focus on the production of “ethically produced wine”. This wine is made in a vineyard that bases its operations on the principles of sustainable development, respecting the rights of employees and the principles of diversity and parity. This is of great importance because the wine industry has a large impact on climate change (Siwiec, 2021). The situation of winemaking in Poland can also be characterized by indicating the stimulators and barriers (conditions) that may occur at each stage of the operation of such a business. The difficulties are mainly related to: the climate in Poland (not every region has the right climatic conditions for viticulture), high financial outlays for running a vineyard and a very long payback time (wine can only be produced a few years after its establishment). However, one should remember about the stimulators of the development of Polish winemaking, which include: very good quality of wine, treating wine as a unique and fashionable product, wine tourism or pro-ecological wine production, which is associated with the production of premium products. These activities have an impact on the vineyard's greater reputation and the image of the region from which the wine comes (Ceo Magazyn Polska, 2022).

Ecological wineries focus on producing wines that will not harm the natural environment. Hence, there are many types of them. These wines can be divided as follows (Kondrat Wina Wybrane, 2023):

- organic wine is a product that has been produced with limited use of artificial, i.e. man-made, through chemical synthesis, means. This means that artificial fertilizers and plant protection products cannot be used in the vineyard. Instead, traditional and modern methods of cultivation are used, such as crop rotation. Thus, organic wine is required to have a relatively low content of, for example, sulphites. In Europe, the law on organic food is the European Commission. All organic wine must be certified,
- biodynamic wine has some of the characteristics of organic wines, but the guidelines for their production are more complicated. The vineyard in this cultivation should be treated as a living organism, which to some extent can be self-sufficient. Natural fertilizers and plant protection products produced on the farm can be used here. In addition, the influence of the phases of the moon on the cultivation of plants is also important here. One of the organizations that certifies biodynamic crops in Poland is Demeter,
- natural wine does not have a single and consistent definition and certification. The production of such wine consists in the least possible interference in the processes of plant growth and wine formation,
- wine with a certificate of limited carbon dioxide emission is a product in which attention is paid to each stage of wine production in order to minimize the emission of the described gas into the atmosphere. Through such measures as, for example, optimization of supplies or the use of appropriate raw materials, the vineyard can receive a certificate of limited CO₂ emissions,
- wine from sustainable production combines all the previously presented definitions and is certified. It also takes into account the many processes involved in winemaking. Not only treatments in the vineyard and wine production, but also related to labelling, packaging and transport.

Apart from that Svobodová et al. (2014) also identified trends in viticulture geared towards environmental actions. They described the use of integrated production (IP) in the vineyard, which is based on strict adherence to the rules set out by the International Organization for Biological Control (IOBC). As part of pro-ecological behavior, the entrepreneur uses the smallest possible doses of plant protection products and prevents soil water erosion by planting plants (other than vines) in every second row. Products from such cultivation are labeled as wines from integrated production. Another type of activities presented by the authors for sustainable development is ecological production, regulated by European law since 2012. Thanks to this, consumers can be sure that the wine they buy is free of all inappropriate substances and that its production does not have a negative impact on the environment (which interesting, until 2012, producers could call wine “organic” even though it came from conventional production).

Campos et al. (2019) also drew attention to the pro-ecological behavior of wine producers. They asked Portuguese entrepreneurs about the possibilities of implementing renewable energy sources in the vineyard and identified the factors that stimulate and hinder the implementation of these practices. One of the most important limitations were financial barriers – manufacturers pointed out the high cost of installing photovoltaic systems, and technological barriers – regarding the storage of batteries for these systems. In the case of environmental factors, the researchers noted the high awareness of the respondents and the willingness to change the existing wine production system to one that would be more energy – efficient and would cause less CO₂ emissions into the atmosphere. Pons et al. (2017) indicated that the macroscopic effects of climate change are modifying

the environmental conditions of viticulture on a local scale in all vineyards around the world. The authors emphasized the importance of appropriate parameters for viticulture. When it is too dry and too warm, the quality of the grapes decreases and, consequently, the quality of the wine also decreases. Blanco-Ward et al. (2019) have a slightly different view on the higher temperature in viticulture. They assessed various climatic indicators, which allowed to conclude that the optimal occurrence of very hot days (above 35°C) and drought has a positive impact on the achievement of high quality wine and its sensory properties. Santos et al. (2012) also indicated that climate variability can have a strong impact on the development of the vine, ultimately affecting the entire wine sector (e.g. socio-economic impacts). Santos et al. (2020) were also of the opinion that climate change is still perceived as a significant risk for viticulture. The adoption of timely, cost-effective and appropriate adaptation strategies can make the wine sector more resilient to a changing climate.

The sustainability of wine is also related to its quality. One of the elements that has an impact on the consumer's assurance about the category of wine is the fact that wine producers receive quality certificates. For Italian wines, Di Vita et al. (2019) identified four categories for classifying wines: PDO², PGI³, basic wine and bulk wine, which in this context is also understood as local wine. The authors noted that the importance of mass-produced wines is growing, which may be particularly related to wine tourism and the desire to buy locally produced wines. In addition, the results obtained may affect the marketing strategies of cooperatives and investment companies existing on the Italian market. Bora et al. (2016) also noted that the quality of wine is very important for both the consumer and the producer and depends, among others, on from eco-climatic conditions. These authors examined several grape varieties from Romania (including Feteasca regala, Feteasca alba and Babeasca gris). Their results showed that in the described climate there are optimal eco-climatic conditions for the proper growth and development of the tested varieties, which directly affects the high quality of the product. On the other hand, Hoang et al. (2016) pointed out that consumers are willing to buy and at the same time can pay more for certified wines imported from other countries, while spending less on domestic wines. This is because the Japanese do not trust their domestic organic systems, hence their increased desire to buy wines from abroad. In turn, Krzywoszyńska (2012) focused on the impact of waste production from the wine industry on the environment in Italy. The author noticed that grape pomace remains after wine production, while one of the wastes at work in the vineyard is vine wood. She also provided several possibilities of using bio-waste generated in the vineyard and winery, e.g. wood as an energy resource in the form of briquettes or bales (both options, however, are difficult to implement and very expensive). In addition, she underlined the importance of changing the current legislation in Italy in the field of bio-waste management.

Additionally, as Plichta et al. (2023) noted, cultural tourism (enotourism) related to wine production may significantly impact entrepreneurs' activities to protect the environment. The vineyards will usually be located in villages or small towns without a direct railway connection. Insufficient communication with vineyards leads to increased road traffic (especially during the season), increased consumption in indicated areas, and the generation of an increasing amount of waste. Therefore, it is essential that for a long time,

² Protected Designations of Origin (PDO) – wine with this designation must be produced traditionally and from start to finish in a given region.

³ Protected Geographical Indication (PGI) – wine with this designation must be produced traditionally or at least partly in a given region.

environmental sustainability is a priority in most strategies for managing tourism products in territories whose attractiveness is a function of ecological balance.

3. RESEARCH METHODS AND ASSUMPTIONS

The analysis of the literature on the subject and industry literature was used in the research. In addition, the survey method and participant observation were used. The research results presented in the publication come from the author's doctoral dissertation. The assumptions for the conducted research were as follows:

- subjective scope: 23 wine producers,
- subject scope: ecological entrepreneurship in wine production,
- time range: the actual study was carried out in the period from October 2019 to December 2020,
- spatial scope: Lower Silesian Voivodeship.

The collected research results were presented in graphic and text form.

The survey consisted of 27 questions and divided into four parts. They concerned:

- characteristics of the enterprise,
- entrepreneurship – its essence and manifestations,
- conditions of entrepreneurship and
- additional questions for the respondent (datasheet).

The research questionnaire mainly consisted of open questions. Closed questions appeared in some parts of the survey related to the characteristics of the company or its details. The survey questions used to write this publication were as follows:

1. What types of entrepreneurship are/are not reflected in your business activity?

The publication author for question 1 prepared a table containing selected types (manifestations) of entrepreneurship and their brief characteristics.

Table 2. Characteristics of selected entrepreneurship types

Selected types of entrepreneurship	Description
Academic entrepreneurship	based on the knowledge of the academic community.
Family entrepreneurship	the owner and employees are a single- or multi-generational family.
Innovative entrepreneurship	is based on the implementation of new and pioneering solutions in enterprises in the form of modern technologies or products.
Imitative entrepreneurship	is based on mapping existing product manufacturing technologies.
Social entrepreneurship	is based on activities aimed at social integration in the aspect of the local community and preventing social exclusion, e.g. through professional activation.
Internet entrepreneurship	economic activity is focused, for example, on selling products or services online.
Ecological entrepreneurship	covers all entrepreneurial activities beneficial to the natural environment, e.g. management of post-production waste.

Table 2 (cont.). Characteristics of selected entrepreneurship types

Selected types of entrepreneurship	Description
Ethical entrepreneurship	ethical values, such as high quality products, are more important than economic values.
Intellectual entrepreneurship	it involves appropriately using existing knowledge to acquire other knowledge. It is characterized by the ability to observe the environment, access and process information, innovation and creativity.
Technological entrepreneurship	focuses on "production technology". It involves producing products in a different way than the competition.
Non-technological entrepreneurship	includes, for example, marketing activities, organization of work in the company and company finances.

Source: own study based on: (Bratnicka, Dyduch, 2014; Charantimath, 2005; Gierańczyk, 2010; Glinka, Gudkova, 2011; Janik, 2004; Klonowska-Matynia, Palinkiewicz, 2013; Kochel, 2013; Lall and Sahai, 2008; Ravichandran, Nakkiran, 2015; Sautet, 2013; Staniec et al., 2018; Wiatrak, 2003; Wielki et al., 2017).

2. What impact did the detailed internal conditions of entrepreneurship have on the development of the business at the stage of establishing the vineyard and now?
3. What impact did specific external conditions of entrepreneurship have on business development at the stage of establishing the vineyard and now?

To clarify questions 2 and 3, the publication author formulated a table with the types of internal and external conditions and assigned examples to them.

Table 3. Selected determinants of entrepreneurship

Conditions of entrepreneurship	
Internal	External
"Hard" elements of an entrepreneur's human potential	Economic (micro- and macroeconomic)
"Soft" elements of an entrepreneur's human potential	Institutional
Continuity of company management	Formal and legal
Tangible and intangible resources of the enterprise	Socio-cultural
Management system and organizational culture	Natural and geographical
	Technological

Source: own study based on: (Błaszczuk, 2013; Czernachowicz, 2011; Koziol, 2009; Mazur-Wierzbicka, 2013; Popega, 2016; Roslan-Karaś and Wasilczuk, 2015; Szczepaniak, 2007).

The survey above questions regarding the conditions shaping ecological entrepreneurship in the production of local wines.

In addition, the research used the participant observation method, which covered the following elements:

- observing – during which notes the researcher takes regarding the place of observation and the objects found there, the behavior of the minded people, events, and interactions taking place,
- conducting conversations with owners – in particular on the detailed conditions of running a business.

Observation of entities participating in the study allowed for the development of research results described in the next chapter of the publication.

4. FINDINGS

Vineyards located in the Lower Silesian Voivodeship are manager mostly in accordance with the policy of sustainable development. Therefore, about 70% of respondents indicated that they represent ecological entrepreneurship (Figure 1) (e.g. Jerzmanice Zdrój Vineyard with ecologically certified vine cultivation or Alvarium Vineyard with nettle “eco-sprays”).

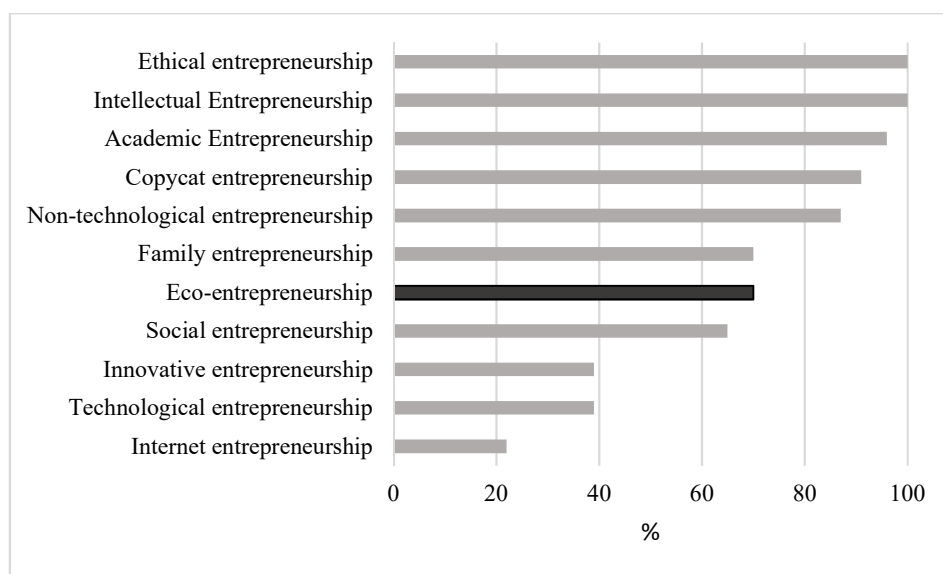


Figure 1. Types of entrepreneurship represented by the surveyed vineyards (in %)

Source: own study.

However, not all entrepreneurs who declared that they pursue the assumptions of ecological entrepreneurship had ecological or biodynamic certificates. They indicated that they did not plant protection products, and the lack of a certificate is mainly due to the complicated procedures for obtaining it and high costs.

Figure 2 presents the respondents' answers, showing the internal conditions shaping entrepreneurial activities.

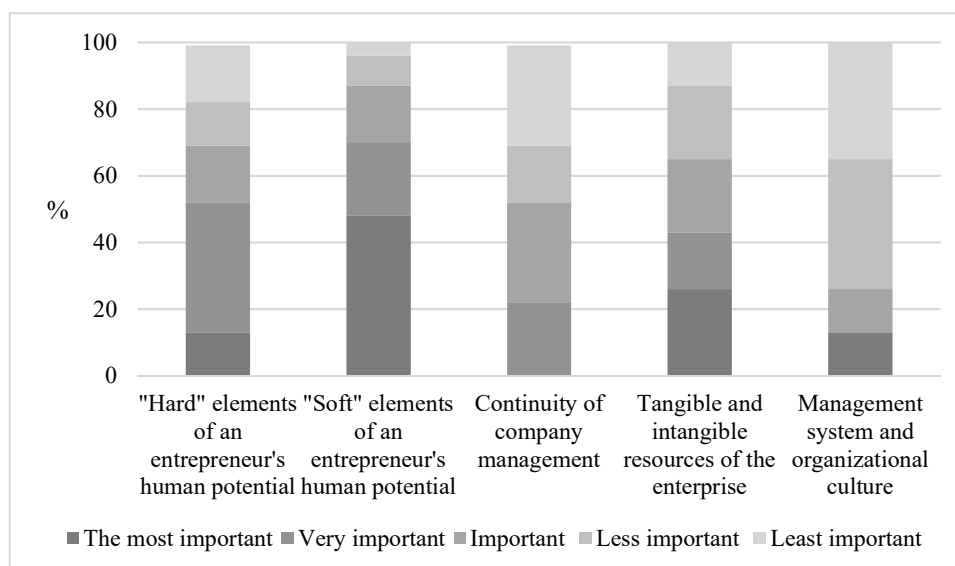


Figure 2. The importance of internal determinants of entrepreneurship in the opinion of respondents

Source: own study.

Entrepreneurs often mentioned “soft” elements of human potential as the most important because they believed that the entrepreneur's character, personality, or attitude determines how their business will develop (they were also stimulators of entrepreneurship). Interestingly, most of the management system and organizational culture and the continuity of the company's management were considered less important or unimportant. These conditions were often indicated as barriers to entrepreneurship.

In the case of the external conditions shown in Figure 3, it can be seen that most respondents indicated natural and geographical factors as the most important (or very important) in running their business, and they also recognized them as stimulators of entrepreneurship. Entrepreneurs recognized the significant (and favorable) impact of climate, soil, and topography in a given place in the Lower Silesian Voivodeship. Establishing a vineyard, running it, and producing wine involves many formalities. In the case of socio-cultural conditions, special attention was paid to local communities' low openness, intense enthusiasm for the business, and low involvement (e.g., in the form of help in the vineyard) – entrepreneurs also considered these conditions barriers.

Interestingly, formal and legal conditions (Figure 3) are less critical for wine producers because they are usually standards or regulations they must comply with. These conditions show wine producers' difficulties formalizing their organic or biodynamic production.

Organic, biodynamic or biological methods of viticulture guarantee the quality of the wines produced. Wines made from organic farming, called organic wines or bio wines. In organic viticulture, organic fertilization is used through the use of composts, natural humic fertilizers, green manure or mineral fertilization limited to rock flour. Ecology in the vineyard is all about respecting nature and the environment and ensuring the right time for the normal growth of healthy grapes, without the use of chemical additives and genetic manipulation.

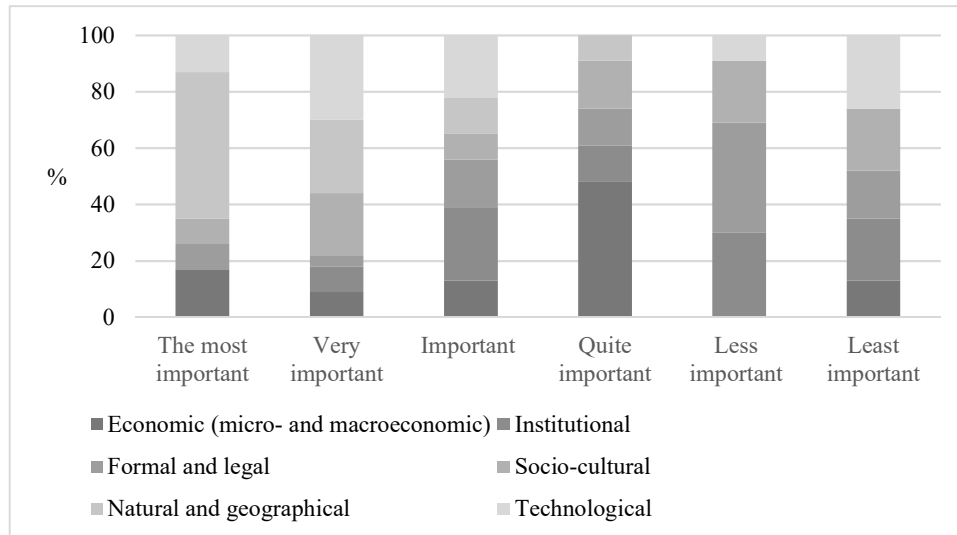


Figure 3. External conditions of entrepreneurship – respondents' answers

Source: own study.

The indicated types of wine illustrate the complexity of the concept of organic production, and thus also organic entrepreneurship. Entrepreneurs do not always understand this type of entrepreneurship properly and often use it without knowing exactly what this type of entrepreneurship means. In connection with the conducted research, it is therefore necessary to rethink the conditions of the described ecological entrepreneurship, using the respondents' answers presented in Figure 4.

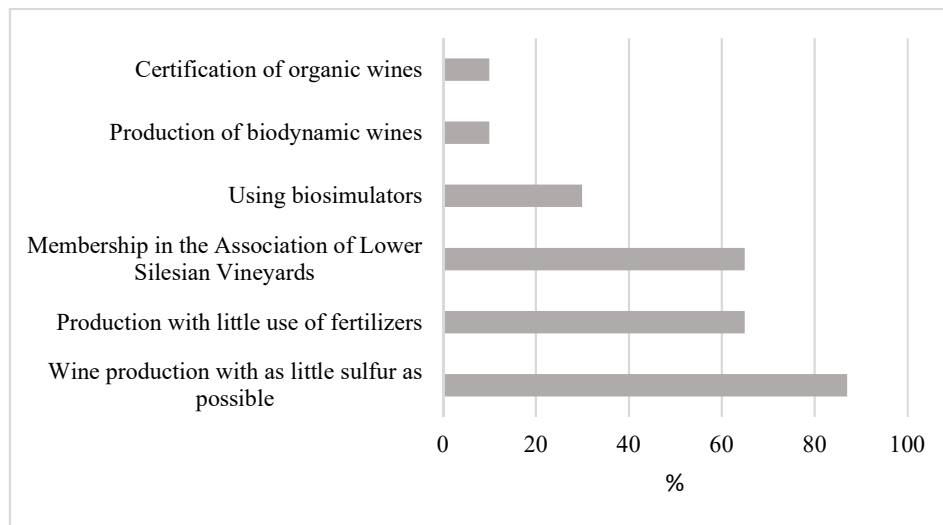


Figure 4. Pro-ecological activities undertaken in vineyards and wineries

Source: own study.

As part of their work in the vineyards, wine producers declared that the most often pro-environmental activities they undertake are the production of wine with the lowest possible amount of sulfur compounds (over 80%) and the production of wine with a small amount of artificial fertilizers (over 60%). Entrepreneurs declared the use of biostimulators in vineyards much less frequently (approx. 30%) and the production of certified wines (approx. 10%). Membership in the Association of Lower Silesian Vineyards was important and quite frequent among the surveyed respondents, which conditioned their possibilities in terms of pro-ecological behavior - in connection with obtaining funds for certification and related to training in the production of wine of the highest quality.

5. DISCUSSION AND CONCLUSIONS

Pro-environmental activities of wine producers are another reserve of entrepreneurship, which is both important for the size of the cultivation and has an impact on the quality of the wine produced. In their own research, winemakers quite often indicated ecological entrepreneurship as the represented type (70%), however, they mostly identified it with the use of a smaller amount of plant protection products and sulfur in wine production. The first issue that should be pointed out here is the use of environmentally safe substances in viticulture - biostimulators. Research conducted at the Research Station of the Department of Horticulture in West Pomeranian University of Technology in Szczecin, on Kamchatka berry bushes of the "Czarna" variety, proved a significant effect of the preparations on the growth of bushes, yield and quality of its fruit (Poterańska et al., 2015). Thanks to the use of biostimulators, it was observed that the bush produced berries with a greater weight. Fruit bushes – such as honeysuckle or vines – are perennial, overwintering plants that tolerate adverse weather conditions very well (Broniecka, Broniecki, 2021). Due to this similarity, the use of the described substances on grapes may have an equally beneficial effect on the quality and size of the harvest as in the case of haskap. An interesting issue in the review of publications on this subject was presented by Campos et al. (2019).

The results obtained as part of research on the internal and external conditions of entrepreneurship suggest that local ecological entrepreneurs producing wine should focus on shaping not only the soft elements of their potential but also those identified as barriers, e.g., over time, it could develop into a responsible system of sustainable management in the company. In research conducted by Žero (2020), respondents indicated that personality determinants are essential in running a business. These studies show that entrepreneurs appreciate the role of soft features of human potential in running their businesses. In the case of the indicated barriers to entrepreneurship, Brignardello (2018) showed that establishing appropriate roles in a family business, producing wine, identifying appropriate tasks for non-family employees, and creating family relationships with them may positively affect the business. Moreover, Marcisz (2017) emphasizes that an appropriately shaped organizational culture is the foundation for the optimal functioning of the organization (also in terms of activities for the natural environment) and its achievement of success, regardless of its size. In the case of external conditions, the most important were, as already indicated, natural and geographical conditions. Rachão et al. (2019) also indicated that the specific features of the region determine the development of the enotourism offer and the formation of territorial identity. These issues, therefore, have a significant impact on the development of the wine industry because, thanks to them, it is possible to attract tourists interested in both enotourism and enogastronomy (wine and gastronomy), as well as taking advantage of other attractions offered by entrepreneurs. In

the case of socio-cultural conditions that respondents considered as barriers, there are many opportunities to increase the local community's interest. The first concerns the entrepreneur's pro-ecological activities that do not change the current landscape of a given area. Winemakers can focus on growing vines without excessive use of plant protection products (Svobodová et al., 2014) and supporting production using biostimulants (Filipczak et al., 2016). Moreover, residents must promote a given place and create its identity (Rachão et al., 2019) because it builds the region's reputation (Menival, Charters, 2014).

In addition Yasir et al. (2023) uses survey responses from 418 students in Lahore and Faisalabad, Pakistan, and developed the study about direct and indirect impact on attitudes towards sustainable entrepreneurship, and perceived behavioral control and environmental value support sustainable entrepreneurial intentions. These findings imply that an individual's perspective on the value of the environment is a significant influence on their attitudes towards pursuing sustainable business practices.

Importantly, providing a control and certification system in the production of local food guarantees the future consumer that the products have been produced in accordance with the applicable regulations on organic farming and are free of contaminants, e.g. plant protection products and hormones (Domagalska and Buczkowska, 2015). In addition, research conducted by the Europejski Program Modernizacji Polskich Firm (2020) shows that micro, small and medium-sized enterprises most often implement activities for Corporate Social Responsibility, aimed at protecting the natural environment, less often at caring for their direct stakeholders, i.e. employees and customers.

Another equally important issue from the point of view of micro-entrepreneurs is ecological production, which requires entrepreneurs to obtain special certificates. The method of obtaining the status of an organic entrepreneur is regulated by the Act of June 25, 2009 on organic farming (Ustawa z dnia 25 czerwca 2009 r.). In the conducted research, only a few vineyards declared that they had certificates of organic production (e.g. Vineyard Jerzmanice-Zdrój). Despite numerous controls, inspections and incurring high costs related to ecological production, respondents from these vineyards see the future of their activities in environmental protection. According to portalspozywczy.pl, it is organic and natural wines (produced locally) that have the greatest potential on the market, because they do not contain artificial substances that improve taste and smell. In addition, natural wines are made from grapes from varieties from local producers. No yeast, sugar or sulphates are added during their production. Natural wine differs visually from standard wines – it is cloudy due to the lack of filtration (portalspozywczy.pl, 2021).

The importance of organic production is confirmed by research by Maciejczak (2019), who asked the respondents whether they would like to buy organic wines and pay more for them at the same time. For the surveyed group of people, the following elements turned out to be important: the ecological method of wine production and the company's activities responding to climate change. Interestingly, respondents are willing to pay more for products with “eco” features than for factors related to other external benefits (e.g. biodiversity, landscape).

Wine producers may try to replace non-organic intermediates with organic ones. One example may be biodegradable heat-shrinkable “caps” for wine or paper labels that can be easily removed from the bottle. Thanks to this, the amount of waste could be reduced to a minimum, and the consumer would be assured that he was buying “ethical wines”, i.e. choosing environmentally friendly products. Another equally interesting idea for less used waste is to use lighter wine bottles. A simpler and so far rarely practiced way to reduce

waste in the form of glass bottles is to use a refundable deposit system for purchased bottles. Pro-environmental activities undertaken by wine producers can also be related to their answers regarding the external conditions of entrepreneurship. With regard to the most important natural and geographical factors, they most often pointed out that without the implementation of sustainable development practices in vineyards, the climate may deteriorate and negatively affect the production. In addition, as the author's own research shows, eco-entrepreneurs are stimulated by two factors: the criteria of social advancement and the size of the demand for a given good. The first issue can be related to activities to promote one's products and the region in order to gain more prestige and respect from local communities. An additional advantage here is greater satisfaction for producers, because – as indicated by Pijet-Migoń and Królikowska (2020) – their production maintains and develops the cultural heritage of a given area. The second issue related to the increase in demand for wines can be stimulated – as noted by Canziani et al. (2018) – through educational activities and increasing consumer awareness. So it is one of the most important issues in the production of wines.

6. RECOMMENDATIONS FOR ENTREPRENEURS

The conducted research was important both for entrepreneurs the local community, and for future scientific activities supporting the implementation of ecological entrepreneurship among local enterprises. Winemakers also showed how crucial ecological entrepreneurship is in the Lower Silesian Voivodeship vineyards and that it is often overlooked compared to other equally essential types, e.g., ethical or intellectual entrepreneurship. The current climate situation forces entrepreneurs to change their activities towards sustainable development.

The essence of entrepreneurial activities of an ecological nature, pointing out that in the Lower Silesian Voivodeship, there are mainly problems related to threats from emissions in cities triggered by industrialization. The use of this additional power is made possible by a security anomaly due to the operation of the air conditioning. It is, therefore, necessary to intensify development activities, especially in a geographical environment that cannot be accessible at the utility level. Because ecological production may impact the environment, local wine entrepreneurs should recommend more often and encourage others to become ecological entrepreneurs. Daniek and Koziolec, 2023 had similar observations.

Community-based cultural tourism (CBT) is an element that shapes the ecological potential of a region. Notice this in their study by Plichta et al. (2023). Tourism of this nature – agritourism combined with enotourism – involves an extended stay among local communities to confront their daily cultural practices and experience the natural environment. This form of tourism reduces the impact of cultural tourists on the natural environment. Local wine entrepreneurs should increasingly promote it – directly in the vineyard or in cooperation with other local food producers – thus creating a network of collaboration beneficial to regional development.

Therefore, the analysis of ecological trends in wine production indicates that producers can focus on areas related to wine production by:

- develop ecological entrepreneurship and combine it with other types of entrepreneurship, e.g., ethical entrepreneurship (interdisciplinarity in entrepreneurial activities),
- production only those drinks that do not harm the environment, such as organic wine,

- pay attention to internal and external conditions shaping ecological entrepreneurship – in particular to barriers that may prevent further development,
- sustainable management of the wine sector in the region, e.g., when organizing wine events or as part of enotourism activities – ecological tourist products,
- willingness to obtain ecological certificates by entrepreneurs and simplifying their receipt on the part of the institution,
- compliance with Polish and European Union law supporting the implementation of sustainable wine production patterns.

Vineyards in the Lower Silesian Voivodship still have to undergo many changes to be able to call themselves “ecological”. Certification of wines as organic products is expensive and difficult – it is worth considering what to do to encourage entrepreneurs to do it and at the same time simplify the entire process of granting such a certificate.

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