

ENTREPRENEURSHIP AS A BASIS FOR SUSTAINABLE DEVELOPMENT OF THE AGRICULTURAL SECTOR OF THE ECONOMY

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Abstract. The article substantiates the expediency of implementing organic agricultural production in order to ensure sustainable development and the restoration of post-war agriculture, and suggests ways of solving the problem of the utilisation of agricultural waste by agricultural enterprises. *Methodology.* In the process of research the scientific works of domestic scientists on the problems of development of entrepreneurship in the agrarian sector of economy were processed. In order to achieve the goal, general and special methods of scientific knowledge were used, namely: abstract-logical, methods of analogy and comparison, induction and deduction (for theoretical generalisation); monographic (for deepening the study of the state and features of development of agrarian entrepreneurship); formalisation method (for determining directions of solving the problem of waste disposal both in plant and animal production). *Results.* The results of the research show that entrepreneurial activity is spreading in Ukraine, because entrepreneurship contributes to the expansion of the field of application of agricultural labour, creates new opportunities for employment of the unemployed rural population and releases workers from inefficient enterprises. It has been established that the main task of these enterprises is to be competitive on the market and to sell products that are in demand by consumers. It was found that organic food products are superior to traditional products in terms of consumer parameters, but inferior in terms of economic parameters, especially price. It has been established that businesses, regardless of their form of ownership, are waste producers. It has been proven that the plant and animal husbandry sectors make a significant contribution to the generation of organic waste, and agricultural enterprises are therefore faced with the important task of effectively managing this waste. *Practical implications.* The introduction of zero-waste production is a decisive step towards the energy self-sufficiency of a farm by processing agricultural waste in biogas plants to produce an alternative fuel such as biofuel.

Key words: entrepreneurship, agricultural enterprise, agricultural sector of the economy, organic products, biofuel, biogas.

JEL Classification: L26, K22, L23

1. Introduction

Today, entrepreneurship is becoming the main type of activity of the majority of the country's population, and it is the link between society and the state that allows domestic business entities to overcome barriers to access world markets in order to support the national economy. The role and importance of entrepreneurship is that:

- entrepreneurship is a lever for changing the structure of the economy;
- the development of entrepreneurship creates a "nurturing environment" for competition;

- business helps to save and rationally use all resources;
- entrepreneurship can be seen as a catalyst for economic development;
- business provides strong incentives for high performance.

In the conditions of the market environment there are many subjects of entrepreneurial activity, among which there is a competitive struggle for the main prize – profit. It can be achieved only under the condition of using the most effective option of resource utilisation, economic risk and innovative ideas.

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An entrepreneur does not have the right to make a mistake in his activities, so his actions must be justified. After all, they have the freedom to make decisions and carry out any activity independently, as long as it does not conflict with current legislation.

In order to start a business and open an enterprise, an entrepreneur needs to be oriented towards the field of entrepreneurial activity and its development, i.e. to possess a set of professional and personal qualities that together provide the newly created enterprise with opportunities for successful functioning and long-term development prospects. In connection with the relevance of this issue, much attention has recently been paid in economic literature to entrepreneurship and the factors of its economic development. Thus, the works of such scientists as I. Cherneha, H. Karpiuk, M. Malik, O. Shpykuliak, O. Suprun are devoted to this topic. However, there is a need for further research into the practical aspects of entrepreneurship.

2. Peculiarities of Entrepreneurship Functioning

According to Article 1 of the Law of Ukraine "On Entrepreneurship", entrepreneurship is a direct, independent, systematic, at one's own risk activity aimed at producing goods, performing works, rendering services with the aim of making a profit, which is carried out by natural persons and legal entities registered as subjects of entrepreneurial activity in accordance with the procedure established by law (The Law of Ukraine "On Entrepreneurship").

As domestic scientist Cherneha I points out, entrepreneurship is a type of economic behaviour based on the autonomy and independence of subjects in terms of choice: what, how much, how and for whom to produce (Cherneha, 2018).

Malik M., Shpykuliak O. and Suprun O. distinguish entrepreneurship as an institution ensuring the innovative development of the agrarian sector of the economy, which acts as a means of structural restructuring, a stimulus for transformational changes through the institutionalisation of economic relations to market conditions. However, the institution of agrarian entrepreneurship has not yet become economically responsible, and the excess of economic power gives opportunities to dictate

the conditions for the formation of relations, which are mainly related to the redistribution of rent, which is not in favour of the peasant owner (Malik, Shpykuliak, Suprun, 2017).

Gutman A. and Bugas V. believe that entrepreneurship contributes to economy and rational use of all resources. The activity of an entrepreneur is inseparable from economic risk. This circumstance is a strong incentive to save resources, requires a detailed analysis of the profitability of projects, a responsible attitude to investments, the rational use of resources, the hiring of labour by the entrepreneur (Bugas, Gutman, 2017).

Business entities (entrepreneurs) may be:

- citizens of Ukraine, other states, stateless persons not restricted by law in their legal capacity;
- legal entities of all forms of ownership as defined by the Law of Ukraine "On Property";
- an association of legal entities operating in Ukraine under a product distribution agreement.

The following categories of citizens may not engage in entrepreneurial activity: military personnel, officials of the Prosecutor's Office, court, state security, internal affairs, state notary, as well as state power and management bodies called to exercise control over the activities of enterprises (Law of Ukraine "On Entrepreneurship").

In order to ensure the free development of entrepreneurship, the rights and obligations of the subjects of entrepreneurial activity are defined by law. The rights of an entrepreneur include:

- establish any type of business;
- purchase property and acquire property rights;
- independently organising business activities, choosing suppliers, setting prices and tariffs;
- to dispose freely of profits;
- to conclude employment contracts with citizens for the use of their labour;
- to independently determine the forms, system and amount of remuneration for labour;
- to receive unlimited personal income;
- participate in foreign economic relations, conduct foreign exchange transactions;
- to use the state system of social security and social insurance (principles and conditions of entrepreneurship).

The responsibilities of an entrepreneur include: complying with current legislation; keeping financial records; making obligatory payments;

concluding employment contracts with citizens who are hired; ensuring proper and safe working conditions, wages not lower than those established by law, and their timely receipt by employees, as well as other social guarantees; respecting the rights of consumers in order to realise their legitimate interests, ensuring reliable quality of produced goods (services); obtaining a licence to operate in areas subject to licensing in accordance with current legislation (Karpiuk, 2021).

Entrepreneurial activity is characterized by such features as:

- 1) economic independence (business entities, guided by their own will, freely choose the types of business activities, as well as the time, place and methods of their implementation);
- 2) initiative (means that an entrepreneur must be active in his or her business, personally engaged in entrepreneurship, and not "delegate" it to third parties);
- 3) systematic (meaning that entrepreneurial activity is carried out repeatedly over a long period of time);
- 4) business at one's own risk (entrepreneurial risk is a certain event with signs of probability and randomness of occurrence that may lead to negative consequences for the entrepreneur; profit as the goal of entrepreneurial activity cannot always be achieved, sometimes the entrepreneur suffers losses for which he or she is responsible, i.e., entrepreneurial risk);
- 5) business activity for profit, i.e., the amount of money by which the income received by the entrepreneur exceeds the expenses incurred by him/her;
- 6) legitimacy (means that economic activity is registered in accordance with the procedure established by law and is carried out in accordance with it) (Boychyk, 2016).

The objective driving forces of entrepreneurship are:

- contradictions – between production and consumption, between the growth of needs and the possibility of satisfying them, between different forms of ownership, interests, supply and demand, etc;
- entrepreneurial creativity of a person – personal initiative, energy, activity, diligence, desire to realise one's ideas, inventions, to prove oneself, to satisfy a healthy ambition is a driving motive for entrepreneurship;

- risk is inherent only to mankind; it is a game, a reasonable calculation, a competitive contest, the joy of victory or the bitterness of defeat; it hardens the entrepreneur and stimulates business;
- needs are ahead of the level of production; the development of society and entrepreneurship creates needs that cannot be met by existing productive forces, which causes the need for new productive forces (equipment, technologies, new professions), and thus stimulates the development of entrepreneurship;

- economic interest is a form of fulfilment of a need, a benefit achieved in the process of implementing economic relations; the specificity of economic interests, and hence entrepreneurship, is determined by the economic and social situation of people; entrepreneurship is both the realisation of their interests and the satisfaction of their needs;

- economic competition – rivalry between entrepreneurs to satisfy their own interests related to the sale of products, performance of works, provision of services to the same consumers; competition is an objective law of formation and development of entrepreneurship, it helps to oust inefficient enterprises from production (Boichyk, 2016).

Entrepreneurship, as a phenomenon of economic life, always develops in a specific socio-economic and historical context. Therefore, its continuous reproduction requires certain preconditions, which can be roughly divided into four groups: legal, economic, political and psychological (Figure 1).

The legal conditions for entrepreneurship are based on the laws and regulations developed in the country. The latter should create the same "rules of the game" for all participants in market relations, i.e., provide the same rights and full economic freedom, prevent intervention of state administration bodies in the economic activity of any subject, except in cases stipulated by law. In other words, businessmen should be able to act "independently" and "freely" within the limits of the law.

The economic prerequisites of entrepreneurship are that multiple owners should function in society. This contributes to the freedom of entrepreneurial activity, the ability to make decisions about the use of property, products, profits and the choice of business partners at one's own risk and peril (Principles and prerequisites of entrepreneurship).

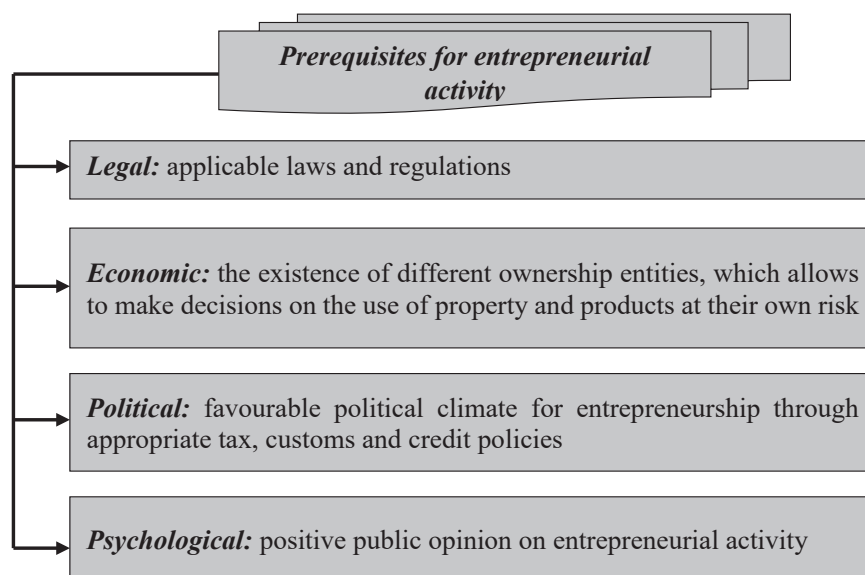


Figure 1. Prerequisites for entrepreneurial activity

Source: (Boichyk, 2016)

The political preconditions for entrepreneurship are the creation of a favourable political climate for entrepreneurship in the country. This can be achieved by developing and implementing a stable policy in the country. Such a policy should provide all business entities with guarantees for the preservation of their property, excluding the possibility of nationalisation. State structures must protect all types of property, including intellectual property (inventions, innovations, new organisational methods).

The psychological prerequisite for entrepreneurship is a positive public opinion towards entrepreneurial activity, as its absence hinders its development. There are many problems in this regard, as the lives of several generations have passed under conditions that have created a negative attitude towards entrepreneurship. The thinking of the majority of our people is conservative and it will not be possible to change it overnight (Principles and prerequisites of entrepreneurship).

According to the Law of Ukraine "On Entrepreneurship", the main principles of entrepreneurial activity are:

- free choice of activities;
- voluntary participation in entrepreneurial activity of property and funds of legal entities and citizens;
- independent formation of the programme of activities and selection of suppliers and consumers

of manufactured products, setting prices in accordance with the legislation;

- free recruitment of employees;
- attracting and using material and technical, financial, labour, natural and other resources, the use of which is not prohibited or restricted by law;
- free disposal of the profit remaining after making the payments established by law;
- independent conduct by an entrepreneur – a legal entity of foreign economic activity, the use by any entrepreneur of the share of foreign exchange earnings due to him at his discretion (The Law of Ukraine "On Entrepreneurship").

Entrepreneurship as an independent economic unit that determines what, how and for whom to produce performs a number of interrelated functions, including:

- resource (economic function) – the most efficient use of labour, material, financial, intellectual and information resources. This function is characterised by the mobilisation direction of development for the purpose of interaction and integrated use of available resources;
- organisational function – introduction of new forms and methods of production organisation, new forms of remuneration and their optimal combination with traditional ones; rational combination of forms of unit division of labour, basic elements of the productive forces system and control over their implementation;

- innovative (creative) function – facilitating the process of generating, producing and implementing new original ideas (technical, organisational, managerial), carrying out technical, economic and research developments, implementing risk-related projects, creating new products and providing new services;
- social function – production of goods and services needed by the society in accordance with the main goal and requirements of the basic law;
- personal function – self-realisation of the entrepreneur's own goal, satisfaction from his work (Lendel, Voloshchuk, Zhulkanych, 2012).

Entrepreneurial activity today is diverse. All manifestations of entrepreneurship can be grouped as follows: commercial entrepreneurship, manufacturing entrepreneurship, financial entrepreneurship, insurance entrepreneurship and intermediary entrepreneurship (Figure 2).

Manufacturing entrepreneurship is any material, intellectual, creative activity related to the production of products, the provision of services and the creation of certain intellectual values. Manufacturing entrepreneurship is one of the most socially necessary and difficult types of business. It does not generate profits as quickly as other types of business, its profitability is usually only 10-12%. In this respect, it is not very attractive for starting a business (Karpiuk, 2021).

Intermediary entrepreneurship is represented by institutions and individuals that provide

intermediary services to entrepreneurs and consumers. Such a need arises when the producer cannot sell the product himself or when the customer wants to find a contractor to carry out certain work. Intermediary enterprises may also provide information, marketing, consultancy and other services (Types of entrepreneurship).

Commercial entrepreneurship is an activity related to transactions and agreements for the purchase and sale of goods and services. In this activity, the entrepreneur acts as a trader, a merchant who buys goods for further resale. The goods are bought at wholesale prices and sold at higher, contract prices. Thanks to the price difference, the entrepreneur makes a profit and covers the costs associated with selling the product. In Ukraine (as well as in other post-socialist countries), commercial entrepreneurship was most developed in the first years of the transition to the market, because the invested capital is returned more quickly and this type of entrepreneurship is characterised by relatively high profitability (20-30% and even more).

Financial entrepreneurship is a special type of business activity related to the purchase and sale of domestic and foreign currencies, securities, as well as the maintenance of settlement transactions. The entrepreneur buys these financial resources from their owners and then resells them to buyers at a profit or lends them for a certain fee. The difference between the

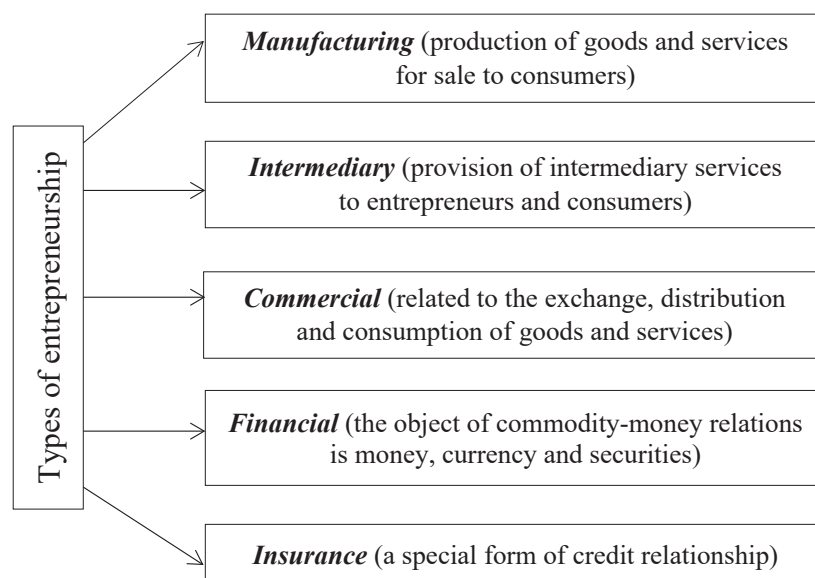


Figure 2. Types of entrepreneurship

Source: www.studies.in.ua

purchase and sale price of monetary resources constitutes the financial entrepreneur's margin. From this difference, expenses are covered and profit is formed (Karpiuk, 2021).

Insurance entrepreneurship is a special form of financial and credit relations. Insurance companies provide life and non-life insurance and receive income which they invest in bonds, shares in other companies and government securities. They therefore provide long-term loans to companies and the government. With the development of the insurance business, risk insurance is becoming increasingly important (Types of entrepreneurship).

Taking into account the agrarian sphere, there are some peculiarities of the development of entrepreneurship, namely:

- 1) entrepreneurship contributes to the expansion of the field of application of agricultural labour, creates new opportunities for employment of the unemployed rural population and the release of workers from inefficient enterprises;
- 2) the seasonal nature of production, which results in a higher level of employment of the population, especially in the spring-summer period than in the winter, and the peculiarity of the sale of products, the receipt of cash;
- 3) all enterprises – subjects of agrarian entrepreneurship are closely related to agricultural producers;
- 4) the special importance of informal regulators (trust, reputation of partners) in view of the predominance of the traditional way of thinking and behaviour of the inhabitants of rural areas;
- 5) the economic process of reproduction is always closely linked to the natural process, which depends on the climate and soil of a given area;
- 6) the dependence on natural and climatic conditions;

It's already evident that the winters are getting milder and later, and the summers are getting more humid. An early spring creates tension in preparing agricultural machinery and carrying out field work, which requires clarification of the optimal dates for sowing early spring crops. A decrease in air temperature during the summer months leads to an increase in the ripening period of heat-loving crops. As a result, harvest dates and times are delayed each year. Over the past 20 years, the average annual temperature has increased by 0.8°C and the average temperature in January and February –

by 1-2°C. This warming will continue, summers will become drier and winters more humid. For plants, this means an early spring and a lack of humidity in summer.

Rising temperatures have caused crops to shift according to region and climate, with sugar beet and soya beans migrating 150 km from south to north, and irrigation water running out in the southern regions. If there is sufficient rainfall, the region's agriculture could see a small increase in the wheat harvest.

With climate change, soil erosion will also increase, landslides will become more frequent and the number of unprofitable wetlands may increase. The warm weather has increased the number of mice and other pests. They can cause many problems in the spring when the growing season begins, followed by the rapid growth of winter crops. Finally, mice can create an artificial drought by digging numerous burrows that prevent moisture from reaching the root systems of plants (Climate change and agriculture).

7) the crucial role of land as a factor of production.

Entrepreneurial activity in the agricultural sector is based on the use of a wide range of objects. These can be means of production in the form of structures, buildings, agricultural machinery, working and productive livestock, production infrastructure, vehicles, money, securities, manufactured agricultural products, technological subtleties (know-how), social infrastructure (provision of social services in the village), but the most important object remains land.

The role and importance of land in different sectors of the economy are not the same. If in industry it acts as a spatial basis for the location of enterprises, then in agriculture land acts as an active factor of production, being at the same time a production base, a means of labour and an object of labour. By applying labour to the land, a person changes the composition of the soil, creating better conditions for the growth of plants, so in this case the land is the subject of labour. When a person cultivates the land as an object of labour, he transforms it into a tool of labour by influencing the growth of plants through it (Sereda, 2020).

As the main means of production, it has the following characteristics:

- unlike all other means of production which are created by man, the earth was not created by man. As a natural body, the earth existed before man

and is itself a condition for man's existence. Soil is therefore a product of nature, the result of a centuries-old process of soil formation;

- since the land was created by nature, i.e. not by man's effort and time, it has no value in the classical sense (as a socially necessary cost). However, it does have a value and a price. That land which is cultivated by agricultural producers, which performs a locational function (the function of placing socially significant objects), or which is simply taken into account in the process of making economic, political, social and any other decisions, that is, it serves as a means in human activity, has value. Therefore, land has no labour value because it is not created by man, but it has a value of another kind – a price – because it is used by man to satisfy his needs, that is, land is useful to human beings. And if the product is useful to man, then he is prepared to pay for it exactly what it costs, i.e., its price. Accordingly, land is truly useful to man and has its price;
- the natural body, the soil, cannot be replaced by any other means. Most agricultural inputs are substitutable, and without land, the production process would not take place at all;
- land is spatially limited, meaning that it is impossible to artificially expand the area of a land plot or create a new land plot or even a part of it. A person can only make better use of the available resources of a land plot and increase the degree of land use by intensifying agricultural production;
- land is characterised by the permanence of its location, i.e., a plot of land cannot be transferred from one farm to another;
- in the process of production, land does not wear out; on the contrary, if used properly,

it constantly improves. Thus, unlike all other means of production, which are subject to physical and moral wear and tear, rendering them unsuitable for further use, land is an "eternal means of production" (Sereda, 2020).

Business entities in the agricultural sector include the following types of enterprises:

Households (including individual entrepreneurs) are not legal entities and grow agricultural products both for their own consumption and for sale. Such farms specialise in the commercial production of vegetables and other more niche crops that are difficult to grow on an industrial scale because of the manual labour required.

Private enterprises in agriculture are represented by farms and private agricultural enterprises.

Farms can only be established by Ukrainian citizens and their activity must be based on the labour of members of the farmer's family, although the hiring of labour is permitted. Land may be owned by the farmer or leased. The size of the farm can also vary from a few hectares to five to ten thousand hectares, which is in fact a fully-fledged medium-sized enterprise. More than 60% of farms have an area of 100 to 2000 thousand hectares (Types of agricultural enterprises in Ukraine).

As a small form of entrepreneurship, farms have advantages over large-scale production:

- they are easy to plan, and market entry and exit do not pose serious problems;
- are characterised by flexibility in their economic activity;
- react quickly to changes in the market situation;
- have obvious savings in intra-farm transport and management costs compared to large agricultural formations;

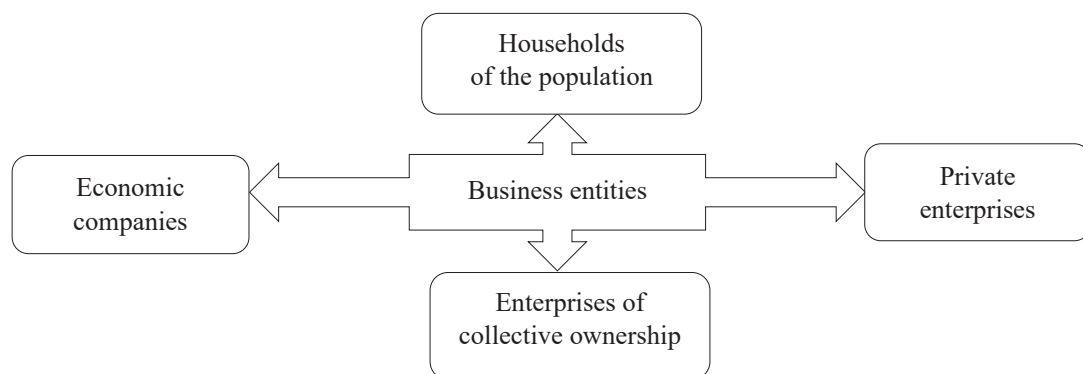


Figure 3. Business entities in the agricultural sector

Source: (Types of agricultural enterprises in Ukraine)

– are more interested in working more efficiently (Amons, 2019).

Private agricultural enterprises are legal entities operating on the basis of private ownership and may be established by Ukrainian citizens, foreigners, stateless persons and legal entities. They are subject to the general rules of the Civil and Commercial Codes on the conduct of business activities.

Collective ownership enterprises, various forms of cooperatives. There are various types of cooperatives in Ukraine. The most common are production and service cooperatives.

Production cooperative – is formed exclusively by natural persons for joint production or other economic activity on the basis of their compulsory labour participation for the purpose of obtaining profit;

Service cooperative – is formed by natural and/or legal persons for the purpose of providing services mainly to members of the cooperative as well as to other persons for the purpose of carrying out their economic activities.

Economic companies can be either national, foreign or with foreign investment. In the agricultural sector, business companies are the most common form of business entity after farms. They are mainly represented in the form of limited liability companies and joint stock companies.

A limited liability company (LLC) is a company created on the basis of an agreement between legal entities and/or individuals by combining their property and business activities for the purpose of making a profit. A limited liability company has a statutory fund, which is divided into shares in the amounts specified in the founding documents – the charter. The law does not set a minimum number of participants in a LLC, but the maximum number of participants cannot exceed one hundred persons. The peculiarity of this type of company is that its members are liable only to the extent of their contributions.

Joint stock companies (JSC). The authorised capital of a JSC is divided into a certain number of shares of equal nominal value, and shareholders are liable for the company's obligations only to the extent of the shares they own. Founders of a JSC may be both natural persons and legal entities. The law stipulates that the authorised capital of a JSC may not be

less than the amount equivalent to 1,250 minimum wages based on the minimum wage rate in effect at the time of the JSC's establishment. JSCs are divided into two types: open and closed.

An open JSC means that its shares can be distributed by open subscription and bought and sold on the stock exchange. In a closed JSC the shares are distributed exclusively among the founders and cannot be distributed by subscription, bought and sold on the stock exchange (Types of agricultural enterprises in Ukraine).

3. Entrepreneurship in Organic Agriculture

The main task of these companies is to be competitive in the market. The companies try to market products that have the greatest demand among consumers. Today, organic products are the most popular among consumers.

Organic products – agricultural products produced in accordance with approved rules (standards), which provide for the minimisation of the use of pesticides, synthetic mineral fertilisers and also prohibit the use of genetically modified organisms (GMOs).

For example, no chemically synthesised mineral fertilisers or GMOs are used in agriculture, but physical and biological methods are used to control pests: ultrasound, noise, light, traps and temperature regulation. In animal husbandry, particular attention is paid to feed (without preservatives, growth stimulants, appetite stimulants) and to stress-free conditions of rearing and transport; the use of antibiotics and hormones is prohibited. For finished products, refining, mineralisation and other methods that destroy the nutritional properties of the product are prohibited (Organic products).

Almost every country in the world is involved in the production of organic agricultural products. The proportion of farms supplying such products is growing steadily. The global consumer market is becoming more and more organic, which means that the number of organic products on the shelves is increasing every year.

A characteristic indicator of the development of organic farming is the size of the organic crop area. Europe (about 90% of which belongs to the European Union) is the world's second largest producer of organic food after Australia. In the EU, the development of organic agriculture is stimulated by a developed

infrastructure, and producers and consumers highly appreciate the advantages of organic agriculture (Mazur, Kovalchuk, 2019).

The main types of organic products consumed in Ukraine are milk and dairy products, vegetables, fruits and mushrooms, cereals and cereal products, flour, seeds, juices, eggs, meat products, oil, sugar, etc.

In 2021, 9,780 tonnes of domestically produced organic products worth about 900 million UAH were sold in Ukraine.

It is equally important that the Ministry of Agrarian Policy and Food of Ukraine cooperates with international projects aimed at the development of organic production and the circulation of organic products in Ukraine, in particular with:

1. The Swiss-Ukrainian programme "Development of trade with higher added value in the organic and dairy sectors of Ukraine" (QFTP), financed by Switzerland and implemented by the Research Institute of Organic Agriculture (FiBL, Switzerland) in partnership with SAFOSO AG (Switzerland).

2. The project "German-Ukrainian cooperation in the field of organic agriculture" (COA).

3. The programme "Organic Trade for Development in Eastern Europe" (OT4D), funded by Switzerland and implemented by IFOAM – Organics International in partnership with HELVETAS Swiss Intercooperation and the Research Institute of Organic Agriculture (FiBL, Switzerland).

4. The EU project "Institutional and Policy Reform of Small-Scale Agriculture in Ukraine" (IPRSA).

5. The USAID Agricultural and Rural Development Programme (AGRO).

Representatives of projects/programmes provide expert assistance in the development of legislative and regulatory frameworks, implementation of legislation in the field of organic production, marketing and labelling of organic products, support various activities related to organic production (Organic production in Ukraine).

In terms of export potential, in 2021, Ukraine exported 260 thousand tonnes of organic products worth about 220 million USD to more than 30 countries. The main importers of Ukrainian organic products during the period were the Netherlands, the USA, Lithuania,

Germany, Austria, Poland, Switzerland, the UK, Italy and Denmark. Ukrainian organic producers also exported to some Asian countries, especially China, Japan and Malaysia, as well as to the United Arab Emirates.

The main organic exports from Ukraine to international markets were cereals, oilseeds and berries. Other products exported were sunflower cake, sunflower oil, sunflower meal, apple concentrate, millet, vegetables and fruit.

According to the European Commission's report, Ukraine ranked 5th out of 126 countries in terms of the volume of organic products imported into the EU in 2021.

Organic production in Ukraine is regulated by the Law of Ukraine "On Basic Principles and Requirements for Organic Production, Marketing and Labelling of Organic Products" and its subordinate legal acts (Organic production in Ukraine).

4. Ways to Address the Problem of Agricultural Waste Utilisation

In addition to producing organic products, farms face the important issue of waste disposal in both crop and livestock production.

Waste is an integral part of every production process. Organic waste is waste of natural origin that undergoes biological decomposition. Crop and livestock production contribute significantly to the generation of organic waste, and farms face the important task of managing it effectively.

The main principles of waste management/disposal on farms are:

- maximum use of farm resources (labour, land, machinery and equipment) to ensure environmentally safe waste disposal;
- ensuring the environmental safety of the territory, people and animals at every stage from the production of manure/slurry to its beneficial use;
- ensuring the economic efficiency of the methods, processes, technologies, machinery and equipment used for the disposal of plant residues and manure;
- compliance with veterinary and sanitary requirements and sanitary and hygienic indicators in the construction of livestock premises, the choice of technology for the collection, transport, storage, processing and use of manure and fertilisers obtained from it.

With the application of advanced technologies, waste management in agricultural enterprises

can be transformed from an environmental problem into a potentially profitable activity – the production of valuable secondary products, including biofuel (Kirilenko, Tokarchuk, 2020).

Biofuel is considered to be an alternative type of fuel obtained as a result of the processing of animal or vegetable raw materials, as well as organic industrial waste and life products. Alternative energy considers biofuel as an option to replace traditional – coal, oil, natural gas, etc. Biofuel belongs to the renewable forms of energy, its main advantage is environmental friendliness, and modern production methods make it possible to obtain fuel samples that are superior to traditional samples in terms of their characteristics and cost.

Depending on the state of aggregation, three types of biofuels can be distinguished:

- 1) Liquid – bioethanol and biodiesel (their production is increasing, they are used as a substitute for mineral fuel – petrol and diesel – for internal combustion engines), demethyl ether, biomethanol;
- 2) solid – firewood, wood pellets (they can be produced from small branches, sawdust, bark, chips and other wood processing waste) and pellets (they are produced from straw, seed shells, nut shells, etc.);
- 3) gaseous – biogas, methane and biohydrogen obtained as a result of the process of natural decomposition of various organic substances – methane fermentation (Biogas).

Traditional agricultural enterprises developing crop and livestock production have significant potential for the production of biofuels, particularly biogas. This is facilitated by the presence of:

- livestock farms, where there is a stable production of manure, which requires further processing and effective disposal;
- vegetal waste (straw, tops of agricultural crops, which are inefficiently used as bedding or are ploughed into the soil without any significant effect);
- food waste;
- sown areas where it is necessary to maintain soil fertility with biofertilisers in order to increase the yield of agricultural crops (Kirilenko, Tokarchuk, 2020).

In the livestock sector, waste from processing and dairy enterprises is the most preferred,

but animal fats provide the maximum fuel yield – 1500 m³ of biogas with a methane content of 87%. The main drawback is the shortage.

In the field of crop production, fresh grass provides the maximum fuel yield: a tonne of raw material produces about 250 m³ of gas with a methane content of 70%. Corn silage is slightly less – 220 m³. Beet tops – 180 m³.

Almost any plant can be used as biomass. The disadvantage is the length of the production cycle. The process of obtaining biogas takes up to two months.

The main advantage of manure is its cheapness and availability. The disadvantage is that the quantity and quality of biogas is lower than from other types of raw materials. Horse and cow excrement can be processed immediately. The production cycle takes approximately two weeks and produces a volume of 60 m³ with a methane content of 60%.

Biogas production reduces the amount of methane released into the atmosphere. Methane has a serious effect on the state of the Earth's atmosphere. All kinds of gases, especially carbon compounds, form a "lens" that prevents heat from escaping into space. So the heat is concentrated in the atmosphere itself, and the planet gets hotter and hotter. Methane is 21 times more harmful than carbon dioxide. The production of biogas and its subsequent use to generate heat and electricity is therefore the most effective means of combating global warming (Biogas).

The process of converting organic raw materials into biogas is called fermentation. The raw material is loaded into a special container that reliably protects the biomass from oxygen.

Fermentation begins under the influence of special bacteria in an anaerobic environment. As fermentation progresses, the raw material is covered with a crust that must be destroyed regularly. This is done by thorough mixing.

It is necessary to stir the contents at least twice a day without disturbing the tightness of the process. In addition to removing the crust, stirring allows an even distribution of acidity and temperature within the organic mass. As a result of these manipulations, biogas is produced.

The resulting gas is collected in a gas holder. From there it is piped to the consumer. Biomass left over after waste treatment can be used as fertiliser in agriculture. In addition, such

fertilisers have a much better and more effective effect on the soil, plant development and groundwater than artificial fertilisers (Biogas plants: economic feasibility and future prospects).

Once the necessary product – biogas – has been obtained, it must be used effectively. Biogas can be used in various ways. According to the economist D. Tokarchuk, biogas can be used in the following ways:

- biogas can be used as a fuel at the place of its production;
- energy can be produced from biogas. At the same time, the waste heat produced can be used. Biogas therefore offers interesting possibilities for decentralised energy supply and is an interesting alternative, especially for large agricultural enterprises in Ukraine;
- biogas upgraded to natural gas quality (biomethane) can be fed into the general gas distribution network, which is an excellent way to transport biogas to consumers and energy storage facilities. In contrast to the expensive and inefficient possibilities of accumulating variable reserves of solar and wind energy, the gas distribution network makes it possible to combine the production and consumption of energy with almost no losses. In addition, biogas production creates additional jobs and is a source of income, especially in rural areas (Tokarchuk, Yaremchuk, 2013).

Today it can be said that the use of biogas in Ukraine is quite promising.

5. Conclusions

Entrepreneurship plays an important role in the functioning of the economic system and its development. Most scholars define entrepreneurship as an independent initiative

activity aimed at making a profit. As for agrarian entrepreneurship, it plays an important role in the development of rural areas, namely:

- business brings additional income to people themselves, which contributes to the improvement of the living standards of the rural population and the growth of their well-being;
- entrepreneurship solves the problems of food supply in rural areas;
- business is an important source of local village councils' budgets;
- promotes the formation of agricultural processing chains, the purchase of raw materials, and the provision of various services.

In the agricultural sector, the development of entrepreneurship is characterised by a number of factors: the seasonal nature of production, the dependence on natural and climatic conditions, the exceptional role of land as a factor of production, entrepreneurship contributes to the expansion of the scope of agricultural work, creates new employment opportunities for the unemployed rural population, etc.

In order to remain competitive in the marketplace, agricultural businesses try to sell products that are in demand by consumers. Today, organic products are becoming increasingly popular, thanks to public awareness of the benefits of consuming them, which are reflected in their positive impact on human health and the environment.

In addition to the production of organic products, farms are faced with the important question of how to dispose of the waste produced on the farm. The introduction of zero-waste production is a decisive step towards the energy self-sufficiency of a farm by processing agricultural waste in biogas plants to produce an alternative fuel such as biofuel.

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