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Challenges and potential for further sustainable development of medium and large agricultural enterprises in Ukraine

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About the Project “German-Ukrainian Agricultural Policy Dialogue” (APD)

The project “German-Ukrainian Agricultural Policy Dialogue (APD)” has been implemented with the support of the Federal Ministry of Food and Agriculture (BMEL) since 2006 and is currently being implemented until 2024 at its request through the executor of GFA Consulting Group LLC, as well as a consortium consisting of IAK Agrar Consulting, Leibniz Institute for Agricultural Development in Transition Economies and AFC Agriculture and Finance Consultants GmbH. The recipient of the project is the National Association of Agricultural Advisory Services of Ukraine “Dorada”. The beneficiary of the project is the Ministry of Agrarian Policy and Food of Ukraine. The project should support Ukraine in the areas of sustainable agriculture, efficient processing industry and international competitiveness in accordance with the principles of market and regulatory policies taking into account the development potential that arises under the Association Agreement between the EU and Ukraine. To meet this goal, the Project should provide information on German experience, in particular, East German, as well as international European experience in development of agrarian and forestry policy framework, as well as on the organization of relevant agrarian and political institutions.

The APD consists of two thematic pillars, one of them – the land component – is managed by BVVG German AgriForest Privatization Agency, a state-owned enterprise that is responsible for the administration of state-owned agricultural and forestry land in (Eastern) Germany. Under the land component, the project offers an exchange of experience and know-how between Ukrainian and German land management experts from BVVG and additional German land management institutions. The land component focusses on political, legal and technical issues related to land management and accompanies the current discussions in Ukraine concerning land market development.



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Summary

The Ukrainian agricultural market is characterised by a large number of enterprises with a significant land bank. Accordingly, large and medium-sized enterprises produce the majority of agricultural products in Ukraine and are more efficient. For example, farms with more than 1,000 hectares of harvested grain and legumes (respectively, large and medium-sized enterprises) harvested 65% of the total gross harvest. In addition, the yields of the crops grown are significantly higher than the market average. Thus, the farms with more than 3 thou hectares of harvested areas of grains and pulses had a yield of 70.4 c/ha, which is 19% higher than the average for Ukraine.

Accordingly, large and medium-sized agricultural enterprises play a key role in production, exports and the overall functioning of the agricultural market. They were the first in Ukraine to introduce sustainable development standards, invest the most in achieving sustainable development goals, and have the largest plans to increase trade with the European Union.

Among the biggest challenges to sustainable development, the experts surveyed mentioned climate change, land, water and air pollution, and corruption. At the same time, the greatest risks for non-compliance with the principles of sustainable development are of a reputational nature.

When comparing the application of sustainability principles in agricultural enterprises compared to enterprises in other industries, the surveyed experts believe that the agricultural sector is the most concerned with these principles. This is due to the specifics of this industry: proper use of resources directly affects performance. If we compare the extent to which Ukrainian agricultural enterprises apply the principles of sustainable development with those in Europe, Ukrainian realities are significantly inferior.

No unanimous responses were received regarding the regulations governing sustainable development in Ukraine. Several regulatory acts were mentioned, but the wording does not contain the phrase "sustainable development", it refers to certain environmental standards.

According to experts, the situation with sustainability awareness in the vast majority of companies is low or non-existent. The only exceptions are large companies, which, due

to the specifics of their activities (exports, cooperation with international financial institutions, publicity, etc.), already use the principles of sustainable development. Accordingly, it is agriholdings that are most interested in addressing sustainable development issues. The opinion of all respondents was unanimous on this issue.

Before the war, large and medium-sized agricultural enterprises that adhered to the principles of sustainable development were actively implementing environmental, social and economic aspects of sustainability. However, the war changed the situation significantly. With the outbreak of war, the contribution to sustainable development slowed down, as the issue of financial survival of farms came to the fore. And it is precisely during the war that less attention is paid to technology and more to their own employees, shareholders and local communities, as well as to support the Armed Forces. Farmers are also forced to quickly change their business algorithms due to the challenges caused by the war. This primarily concerns the reduced financial capacity of enterprises and the increased use of alternative energy.

According to experts, the top investment needs of Ukrainian large and medium-sized agricultural enterprises are to restore the potential to increase crop yields and livestock productivity, which were significantly reduced due to the low liquidity of Ukrainian agricultural enterprises during the war. There is also an urgent need to rebuild infrastructure and establish export logistics, including through new alternative routes.

According to respondents, the main driving force behind the introduction of sustainability initiatives by Ukrainian agricultural enterprises is the possibility of selling products to global companies or exporting to the EU. However, the need to attract additional foreign capital is also driving the transition to sustainable development principles.

Experts noted the war, lack of knowledge, distrust of the state and corruption, lack of financial resources and incentive programmes as the main obstacles to implementing sustainable development.

As for the process of preparing Ukrainian agricultural enterprises for European integration, experts assess it as rather inactive and gradual. This topic is constantly being raised, but there is no clear understanding. There is no clear understanding of whether the war has accelerated or slowed down this process. The situation is similar with the assessment

of the readiness of Ukrainian agricultural enterprises to comply with the requirements of the Green Deal. Additional incentives and clarifications are needed.

Therefore, in order to accelerate the process of adapting the requirements of the EU Green Deal/ CAP to Ukrainian agricultural enterprises, the Ukrainian government needs to change Ukrainian legislation and do so with due regard to Ukrainian realities, and then communicate their principles to both Ukrainian agricultural enterprises and end consumers.

Large agricultural enterprises have already done a lot in terms of sustainability. Key achievements include precision farming, no-till, organic production, investments in bio-energy and rural infrastructure.

Almost all respondents understand that Ukrainian agribusiness has no other option but to implement the principles of sustainable development after the war to be able to integrate into the EU. It will be a long, complicated and expensive process. And there will be a huge number of challenges of various kinds that will need to be addressed. These challenges include the lack of a clear understanding of sustainable development by agricultural producers and the need to communicate this information, setting clear sustainability goals for better understanding, sufficient funding, de-mining of agricultural land, finalising the legal framework, gaining new experience and knowledge, and having motivation tools.

Research methodology

The study involved representatives of large and medium-sized Ukrainian agricultural holdings, as well as resource companies that provide agricultural enterprises with inputs. Representatives of these companies are responsible for sustainable development. In the course of in-depth interviews, they were asked to assess the implementation of sustainable development principles before and during the war, as well as the challenges and potential for further implementation of sustainable development principles, especially against the background of further integration into the European Union. The respondents were asked to cover the above issues not only on the basis of their own enterprises, but also to make an assessment of Ukraine as a whole. The interviews were conducted online,

at least 30 minutes, as during the war in Ukraine, company employees are physically located in different regions of Ukraine and abroad. Questionnaire is included in Annex 1.

Table 1: Companies and their representatives that participated in the survey

Company	Surname and name	Job title	Website
Agroprosperis	Vitalii Ivanchenko	Chief Innovation Officer	https://www.agroprosperis.com/
Astarta	Yulia Bereshchenko	Director for Development and Investor Relations of the agro-industrial holding	https://astartaholding.com/
Continental Farmers Group	Nonna Schmidik	Director of Communications and Social Projects	https://cfg.com.ua/
Harveast	Tatiana Alaverdova	Chief Commercial Officer	https://harveast.com/
IMK	Alex Lissitsa	CEO	https://imcagro.com.ua/ua/
Agrain	Pavlo Mamin	Director of Consult Agro, Agrain Agricultural Group	https://www.facebook.com/agrain.com.ua
LNZ	Serhii Yakshin	First Deputy Chairman of the Supervisory Board for Legal and Land Affairs	https://www.lnz.com.ua/
Agrotrade	Oleksandr Ovsyannik	Deputy Director for Operations	https://agrotrade.ua/
Baryshivska Grain Company	Yevhen Radoveniuk	CEO	http://www.grainalliance.com/ua/
Gals Agro	Serhii Kravchuk	CEO	https://gals-agro.com/
Cygnat Agrocompany	Ihor Shilyuk	CEO	https://cygnet.ua/ua/
Syngenta	Tatiana Smovzh	Head of Sustainability at Syngenta	https://www.syngenta.ua/
Bayer	Nataliia Guseva	Manager of the company's government relations	https://www.bayer.com/uk/ua/ukraine-home
AGR	Svitlana Korytska	Director of Corporate Affairs	https://agr-holding.com/
Nor-estagro	Artem Lysak	Director of Business Development	http://nor-estagro.com/
BASF	Oksana Alekseeva	Public Government Affairs Manager BASF Agricultural Solutions	https://www.basf.com/ua/uk.html
Agromino	Svitlana Omelchenko	Chief Financial Officer	https://www.agromino.com/
Kozyatyn meat processing plant	Sergey Bugayenko	Financial Manager of the Ukraine Group and Sustainable Development Specialist	https://kpp.org.ua/
AGRO-REGION	Taras Ivanishin	Sustainability Manager	https://agro-region.com/

UCAB	Roman Slasten	CEO	https://www.ucab.ua/ua
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Section 1. Brief overview of the role of medium and large enterprises in the production and export of agricultural products, experience and prospects of trade with the EU

The Ukrainian agricultural market is characterised by a large number of enterprises with a significant land bank. According to the State Statistics Service of Ukraine, in 2021 there were 39,301 enterprises with agricultural land. 12% of them had a land bank of 1 to 5 thousand hectares, and 2% had more than 5 thousand hectares. At the same time, enterprises with 1 to 5 thousand hectares cultivate 49% of the total area of agricultural land, and farms with more than 5,000 hectares - 25%. It should be noted that agriholdings are often registered as a group of enterprises, so it is safe to say that 74% of the total area of agricultural land is cultivated by large and medium-sized enterprises.

Table 1. Distribution of enterprises by the area of agricultural land owned and used in 2021

	Number of enterprises		Area of agricultural land	
	units	in % of the total	thousand hectares	in % of total agricultural land area
Enterprises with agricultural land, ha	39 301	100	20 823	100
up to 5.00	1 766	5	6	0
5,01-10,00	1 827	5	14	0
10,01-20,00	3 036	8	47	0
20,01-50,00	9 460	24	353	2
50,01-100,00	5 167	13	374	2
100,01-500,00	9 371	24	2 290	11
500,01-1000,00	3 228	8	2 314	11
1000,01-5000,00	4 845	12	10 150	49
more than 5000.00	601	2	5 274	25

Source: State Statistics Service of Ukraine

Accordingly, large and medium-sized enterprises produce the majority of agricultural products in Ukraine and with greater efficiency. Thus, farms with more than 1 thousand hectares of harvested area of cereals and pulses (respectively, large and medium-sized enterprises) harvested 65% of the total gross harvest. In addition, the yields of the crops grown are significantly higher than the market average. Thus, the farms with more than 3 thousand hectares of harvested areas of grains and pulses had a yield of 70.4 c/ha, which is 19% higher than the average for Ukraine.

Table 2: Grouping of enterprises by the size of harvested area of cereals and pulses in 2021

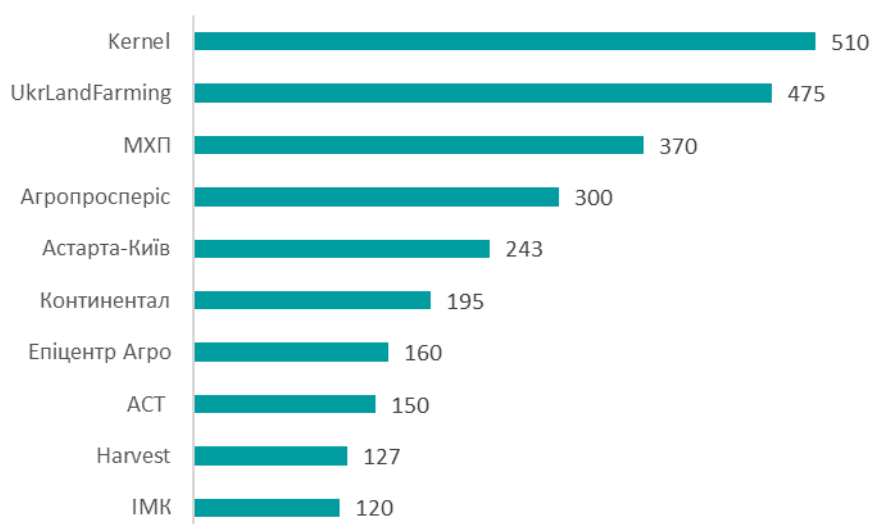
	Number of enterprises		Production volume (gross harvest)		Yield, c/ha
	units	in % of the total	thousand tonnes	in % of gross sales	
All enterprises	32 403	100	69 689	100	59,3
up to 1 thousand hectares	29 319	90	24 365	35	50,2
1-2 thousand hectares	1 938	6	15 567	22	57,9
2-3 thousand hectares	604	2	8 978	13	61,5
more than 3 thousand hectares	542	2	20 778	30	70,4

Source: State Statistics Service of Ukraine

Agriholdings are characterised by a land bank of 10,000 hectares or more, which is divided into clusters and operates in several regions of Ukraine. In their structure, they have a management company with appropriate management - the board, directors by areas, departments, including an IT or GIS department responsible for precision agriculture. A cluster is a production unit where agricultural products are produced/cultivated. Most clusters have independent units with their own management, agronomists, engineers, precision farming specialists, and machinery fleet, in accordance with the land bank. Often, the structure of an agroholding as a separate legal entity includes elevators (with access rails, transshipment points, etc.), livestock farms, processing plants, feed mills, orchards, etc. During cultivation agricultural crops (corn, barley, wheat, sunflower, etc.), they are export-oriented, either through their own trading structures, traders or direct deliveries abroad.

Due to the need to manage large assets, land bank, machinery fleet, personnel, and production inputs (crop protection products, seeds, fuels and lubricants, fertilisers), agriholdings are leaders in the use and implementation of IT technologies and precision farming technologies, such as differentiated application and sowing, GPS control and autopilots, electronic maps, satellite images, enterprise management systems, etc. It should be noted that most approaches to implementation are integrated, with data analysis and use in their work.

Graph 1. The largest agricultural holdings in Ukraine and their land banks, thousand ha



Source: Latifundust

Medium-sized agricultural enterprises have a land bank of between 1,000 and 10,000 hectares, mostly without division into independent clusters. These enterprises mainly cultivate land within one oblast or two adjacent oblasts of Ukraine. Access to finance and bank lending depends on the financial performance of the companies. They are focused on both exports (grain sales from traders) and the domestic market, selling their products to processing companies. Most of them have a single material and technical base with a fleet of machinery in accordance with the area of cultivated land, tanks for storing fuel and lubricants and premises for other resources, etc. They may include silos (with a capacity of 10,000 tonnes), dairy farms, and gardens.

Given the above facts, it can be argued that it is large and medium-sized agricultural enterprises that carry out the largest volumes of Ukrainian exports . And they were the

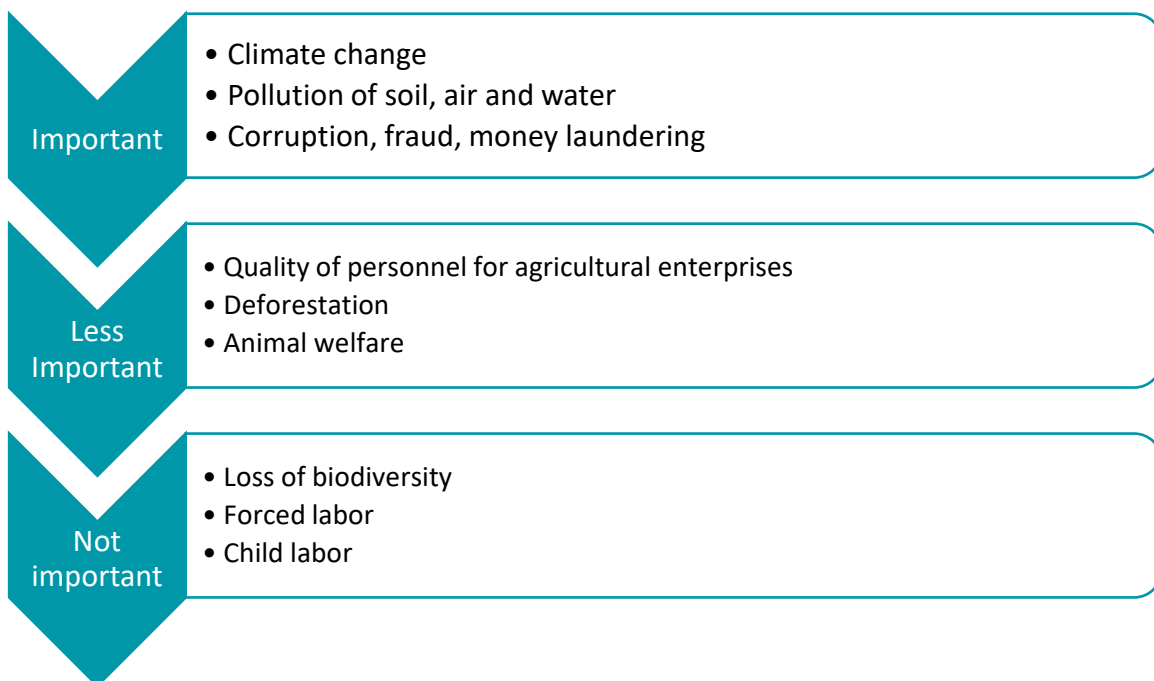
first in Ukraine to introduce sustainable development standards, invest the most in achieving sustainable development goals, and have the biggest plans to increase trade with the European Union.

Section 2. Problems of sustainable development and risks of not using the principles of sustainable development in Ukrainian agriculture

Sustainable development challenges in Ukraine

The respondents identified the following sustainability issues in Ukraine. The problems are listed in descending order of their relevance in Ukraine according to the respondents.

Figure 1: The degree of relevance of sustainability issues for the Ukrainian agricultural market according to respondents



Climate change. This factor forces agricultural producers to change their technological processes and crop rotations.

Water, soil and air pollution. Soil contamination is the most frequently cited factor, but this factor emerged during the war and is related to the mining of territories and the presence of shell remnants, as well as partly due to the use of pesticides. Next, the

condition of water and its availability is noted. The issue is particularly acute in southern Ukraine. The least pollution is noted in the air, and not even pollution, but greenhouse gas emissions.

Corruption, fraud, money laundering. This problem is still present in Ukraine and it has a negative impact on the development of our country. First of all, the existence of a shadow market in Ukraine, which operates without paying the relevant taxes, as well as the corruption component of the controlling state bodies, is noted.

Quality of personnel for agricultural enterprises. Respondents noted the low quality of training for agricultural enterprises, although this trend has been improving in recent years.

Poor working conditions. None of the respondents identified this as a problem of sustainable development. Ukraine has already passed this stage.

Deforestation. The respondents noted that deforestation only affects Ukraine regionally and cannot be identified as a global sustainable development issue.

Animal welfare. This issue is not yet relevant for Ukraine which may be due to limited awareness.

Direct remarks of the survey participants on current issues of sustainable development

Climate change.

"Climate change is real and we can see it in our work with different crops in different regions of Ukraine. Due to climate change, some crops can no longer be grown at all. For example, soybeans, which cannot be grown in most of Ukraine anymore, can only be grown in western Ukraine. The same applies to rapeseed. Due to the ongoing climate change, it cannot be sown according to the technology at the end of August because there is no moisture."

Water, soil and air pollution.

"Before the war, we were dealing with the following sustainability issues, mainly climate change, which is forcing us to change production practices."

"Climate change is a fact and a problem. The south of Ukraine is becoming increasingly arid, and without irrigation we won't earn much there any time soon. But first we need to win it back."

"The state of the soil in the context of the war is now associated with mines and bombing remnants. There will be huge problems with the soil after the war is over, because active hostilities have been or are taking place on a third of our territory."

"As for soil contamination, this also applies to pesticides, which may be partially true. There may be certain nuances, because science says that some of them should be used no more than once every 3 years. In our country, based on practice, in many cases this is not followed."

"Water pollution is a problem all over Ukraine, regardless of whether it is rural or non-rural: wastewater, emission control, etc."

"Unfortunately, there are still chemicals being released from factories that have not yet switched to sustainable production."

"The issue of access to water for irrigation. There is a problem with the water source in our region. We analysed how much land we can irrigate, and we are limited in water. There are reservoirs, but the amount of water needed for irrigation is limited. We calculated that if we invest in irrigation and install irrigation systems where there is water, we can cover 1.5-2 thousand hectares of land with irrigation, which is 5-7% of our land bank."

"There were problems with land reclamation in Mykolaiv region, and the water was contaminated. If enterprises discharge pollutants into the water and farms use it for irrigation, they are not only growing non-organic products, but it is also impossible to grow products for non-food purposes."

"In terms of water pollution, there are certain issues regarding the application of fertilisers near ponds. Sometimes there are stories when the sanitary strip, which is prescribed by law depending on the size of the 'water mirror' and fertilisers partially fall in, is not observed."

"Air can be viewed in terms of greenhouse gases. If we talk about crop production, the main source of them is fertilisers. In most cases, we under-use them or do not exceed the norms approved in the EU."

Corruption, fraud, money laundering.

"It exists on the ground, but not all workers understand that they need to change to conscious work. All this has a negative impact on the result."

"Corruption is a huge problem here. Even in wartime, we still have corruption."

"There are indeed such problems at the state or regional level. But we consider it an external factor that we have no influence on."

"Money laundering. Part of it is tax evasion."

"The fundamental problem of Ukraine's agricultural sector is inequality in tax administration. 30% of the land is under shadow cultivation. Accordingly, if 30% of the land is under shadow cultivation, then 30% of the sector operates in the shadows. These companies generate increased corruption and inequality compared to companies that pay taxes. Companies that pay taxes, which are more developed, are less competitive. That is, we need to create a level playing field for all companies so that companies that are white and pay taxes do not feel that they are black sheep."

"Inspections of environmentalists and all corrupt bodies that come not to inspect, but to take bribes. If you can't deal with this, then at least give a moratorium for 10 years, so that no one will come to check you. Because as soon as there is information that someone somewhere starts to do something, everyone around you is like a predator."

Quality of personnel for agricultural enterprises.

"We have a huge problem with training personnel for agricultural enterprises. The issue is education. Fortunately, it is improving, but this is not enough, given that due to the war, the agricultural sector has become the driving force of the economy, and the number of graduates and their quality is not enough."

Poor working conditions.

"Poor working conditions are a thing of the past. Today, almost all agricultural companies make sure that all working conditions are decent and that wages are appropriate."

"There may be some issues, but most are trying to improve them, they are not getting worse. In addition, equipment is being updated, which improves working conditions."

"As for child labour, it is no longer relevant. Previously, children from schools were involved, for example, in ripping out rye. It was voluntary and forced labour."

Deforestation.

"The problem of deforestation is relevant for many parts of the world. It is not a specific Ukrainian problem. It is partly there, but for us it is more relevant that we introduce meadows or floodplains into the crop rotation that should not be cultivated."

"Deforestation concerns the Carpathians, where there are large areas of deforestation. Everything else is not a big problem."

"As for deforestation, agricultural production has nothing to do with it, because we work within existing fields. We do not need to cut down forests."

"We do not have large-scale deforestation. Except for a little bit of forest belts. Forest belts are not cut down by agricultural producers, they are cut down by local people who do not have money for other heating alternatives or simply buy firewood. Agricultural producers understand that forest belts are a snow retention system, reducing soil erosion problems."

Animal welfare.

"Animal welfare is not on the agenda as it is in Europe, because we do not have the same legislation as in Europe. Therefore, in most cases, we are guided by the way it was in Soviet times."

Risks of not applying the principles of sustainable development

As for the risks of not applying sustainability standards, respondents' opinions were divided. Some of them do not see any risks, while others noted several risks, mainly reputational, market and regulatory.

As for reputational risks, companies are increasingly concerned about their reputation every year, especially public companies. Moreover, reputational risks are assessed both at the global level (the company is a representative of Ukraine) and at the regional level (at the community level).

Market risks primarily include the inability to sell products if sustainability standards are not met, both in the domestic Ukrainian market and on global markets.

Regarding regulatory risks, respondents also had mixed opinions about the impact of a country's regulatory policy on sustainable development. For some respondents, the large number of norms leads to their ignoring, while for others, it stimulates compliance.

Direct comments from survey participants on the risks of not applying the principles of sustainable development

"While no one used to care much about them, companies now realise that a bad image affects their ability to sell their crops, buy at a good price, and sign a contract with a partner. The trend is that companies are dealing with these risks."

"These are risks to the country's image, because there are certain standards for products and stereotypes about products that come from countries that do not adhere to the principles of sustainable development. Therefore, first of all, these are reputational risks for the country's business and food production."

"Reputational risks may relate to irresponsible use of plant protection products, pesticides, raiding, non-fulfilment of agreements and many other issues. There are many public companies among large businesses: it depends on the interest rates at which they can raise financing. That is why they care about their reputation, as it provides them with certain benefits. The same is true for medium and small businesses, but these reputational risks are not at the national level, they are at the local level. It is, relatively speaking, "what will people say?", how he paid the shares or did not pay the shares, whether he poisoned people with chemicals or not.

"If we are talking about exceeding the norms of active substances in food, this may mean depriving them of the opportunity to sell these products in supermarkets."

"There are risks. In the grain market, as far as forward purchases are concerned. A significant part of those who sold grain under the forward contracts cancelled the contracts despite the penalties (the situation in 2021). A significant part of them stayed and fulfilled their obligations, even though they knew that the current market situation would result in no income. We have evolved quite well over the past 20 years."

"Regulatory risks are associated with over-regulation, which is a legacy from the Soviet era: an incredible number of rules, regulations, instructions, approvals, licences, etc., which have been gradually reduced somewhere, but still remain. It is this large mass and the inability to comply with them that partly pushes all actors to complete non-compliance. The issue here is to reduce the minimum that can potentially be met, and compliance with this minimum will not be so expensive."

"The government seems to be trying to be liberal with the market, but there are authorities such as the Tax Inspectorate, which imposes certain fines and influences companies to comply with the law. There are regulatory risks, the size of the company does not affect this, everyone monitors compliance with certain regulations and analyses these risks."

Chapter 3. Awareness of the problems of sustainable development in Ukrainian agriculture

Comparison of Ukraine's agricultural sector with other Ukrainian industries and countries in terms of sustainability

According to the respondents, it is agricultural enterprises that are most concerned with the implementation of sustainable development principles. This primarily concerns climatic conditions, as they affect the performance of these enterprises and the quality of their main resource - land. The agricultural sector, unlike all other sectors of the Ukrainian economy, makes a significant contribution to the development of communities.

However, there is an opinion that the agricultural sector is still inferior to the food industry.

If we compare the use of sustainable development principles with other countries, Ukraine lags far behind the EU, but the situation is better compared to the rest of the world. Moreover, we are showing positive dynamics.

Direct remarks of the survey participants on the comparison of the Ukrainian agricultural sector with other Ukrainian industries and other countries

"Agriculture is a unique industry compared to all others, as it is a producer of greenhouse gases, but it can also potentially be a sink. In order for agriculture to help with climate change issues, we need to change the way we cultivate the soil. This is already starting in Ukraine, as there is a growing awareness that climate change affects absolutely everyone. Agricultural producers were the first to feel it in terms of yields and the frequency of atypical weather conditions (drought, high rainfall, etc.). This year was indicative. We had a dry late spring, which led to lower yields of winter crops. And the autumn was wet with a lot of precipitation, which prevented us from harvesting corn on time, and it is still in the field.

Therefore, extreme weather conditions are one of the most striking manifestations of climate change, and it primarily affects agricultural workers. And they have seen how the crop growing areas are changing. If you look at the geography of sunflower cultivation, it used to be only in the south and east of Ukraine, but now, due to climate change, the sunflower growing zone is already shifting to the west and north. The same is happening with sugar beet, which shows higher yields in western Ukraine. Therefore, there is much more awareness in agriculture than in other industries."

"Strangely enough, it is the specifics of the agricultural sector that make us more concerned than other industries. Firstly, we have a long-term production cycle, we have long-term lease agreements. We are all interested in working on this land year after year. It doesn't matter if you are a small farmer or a fairly large producer, I don't know of any deliberate cases where you would kill the land you work on."

"Compared to other industries in our country, the agricultural sector is very advanced in this area, because there is a great emphasis on community development. A great deal of emphasis is placed on increasing workers' salaries. In recent years, wages have been rising and the socio-economic conditions of the population in rural areas have improved. There have been environmental improvements in terms of the optimal use of protective equipment, fertilisers and so on."

"In general, in terms of sustainability, the use of such terms and any practical actions by companies to introduce sustainable development in the agricultural sector is less than in other FMCG producers. However, the tendency is that most companies still care about sustainable development and its aspects (ecology, social responsibility, community engagement). The trend is positive. But there are certain factors that slow down the process, such as the war with Russia."

"It is important to understand which countries to compare with. Compared to the EU, we are much smaller. Compared to Asian countries, for example, we look great."

"10 years ago, few people cared about this issue. With the development of the industry, the principles of sustainable development are moving to a different level and companies are paying more attention to it. 10 years ago, agricultural development was extensive, but now it is more intensive."

Regulations governing sustainable development in Ukraine

Regarding regulations related to sustainable development, the vast majority of respondents could not name specific regulations. UN documents were often mentioned, but mostly documents related to certain components of sustainable development (sanitary standards for the use of plant protection products, monitoring of reporting and verification of greenhouse gases, water and soil pollution, etc.).

Direct remarks of the survey participants on the regulations governing sustainable development in Ukraine

"If I'm not mistaken, an agreement was signed with the UN back in 2015 or 2016, and from 2019 to 2030, there are 17 goals that Ukraine is tracking the results of achieving them. There is monitoring that tracks the achievement of the goals. Ukraine is trying to achieve these goals by 2030."

"As far as I know, there are no specific regulations on sustainable development issues, but these issues are regulated in their own field (water, soil, air pollution, use of plant protection products, etc.). The wording does not mention sustainable development, but rather certain environmental standards."

"The most important regulation is the one on soil health and crop rotation. Of the regulations, the most important is that crop rotation is observed. This is one of the main reasons for soil health and a prerequisite for sustainable development in agriculture."

"Nothing comes to mind. In terms of handling plant protection products, we have two aspects - transportation and transport policy, plant protection products are dangerous goods, so there are certain risks."

"Sanitary standards are the closest thing to an environmental aspect of sustainable development. Nothing else is known."

"If we talk about sectoral laws, we have the law 'On the Principles of Monitoring Reporting and Verification of Greenhouse Gas Emissions', which is in place, but the system is not yet working. The war is one of the reasons. In the near future, a number of legislative initiatives will be adopted concerning the crop protection sector and the placement of plant protection products. Sooner or later, the law on Hazardous Waste will be adopted, but it will only be adopted."

Non-governmental organisations promoting sustainable development

The organisations that promote sustainable development are more private, but before the war, these issues were raised at the state level.

Among the non-governmental organisations, international companies that adhere to the principles of sustainable development and for which Ukrainian companies are suppliers, which must also adhere to these principles, are primarily mentioned. Also mentioned are such global organisations as the UN, USAID, Chapter Zero, FAO, which periodically hold events to promote sustainable development. However, there is no information on the systematic work of non-governmental organisations.

Direct quotes from survey participants about non-governmental organisations that promote sustainable development

"This is the topic that is most promoted by private organisations. Ukraine supplies ingredients for processing to many multinational processing companies (Nestle, Danone, Carlsberg, etc.). All of these companies have scientifically based decarbonisation standards, just like global companies. And they strive to implement them, including through their

supply chains. We are their suppliers, and they cannot achieve their decarbonisation targets unless their suppliers also achieve these targets. That is why we constantly report to them on our sustainability measures. That's why it's a topic that is being promoted by the business community."

"The topic of sustainable development is constantly on the agenda, raised in the press, and these issues were discussed in the Verkhovna Rada committees before the war started."

"There are some. This includes the UN Global Compact, which works in Ukraine. There are a few NGOs (Chapter Zero) that are working on this, but I have not seen much support at the business level."

"When the 17 UN Sustainable Development Goals were adopted, there were a lot of initiatives and trainings from this organisation. One of the goals is gender equality, so in the agricultural sector they organise seminars and webinars to engage women. This is information for 2020-2021."

"USAID, the UN held a series of training events on sustainable development in 2021, and representatives of various companies from Ukraine were involved."

"There are more and more organisations in Ukraine that promote this topic. The American Chamber of Commerce has its own sustainability committee and promotes it. There is also an association of experts on sustainable development in Ukraine, and FAO often runs projects. Union of Professional Environmentalists. Eco Advocacy.

The level of awareness of Ukrainian agricultural enterprises on sustainable development

According to experts, the situation with sustainability awareness in the vast majority of companies is low or non-existent. The only exceptions are large companies that, due to the specifics of their activities (exports, cooperation with international financial institutions, publicity, etc.), already use the principles of sustainable development.

Direct responses of the survey participants on the level of awareness of Ukrainian agricultural enterprises about sustainable development

"In most cases, no one understands the term 'sustainable development'. Therefore, there is no point in talking about any compliance, because no one really understands what we

are talking about. Often, sustainable development is confused with ecology, biodiversification or some other things. There are very few people in Ukraine who understand what we are talking about and what the principles of sustainable development are, as spelled out somewhere in European standards. Therefore, in fact, if we are talking about the regulations that are prescribed in Ukraine and the legislative framework was in place, but de facto no one adheres to it and no one really knows about it."

"If we are talking about large agricultural companies that are publicly traded and listed on global exchanges, they know everything, they have heard everything. They have specialists who deal with these issues. But there are up to 10 of these companies. All other companies, in most cases, do not understand what ESG is. Now banks are starting to demand, first of all, the European Bank for Reconstruction and Development, to comply with certain standards. Therefore, those who work for the EBRD or IFC understand something. Everyone else does not understand what we are talking about when ESG is mentioned."

"I don't know of anyone in Ukraine who adheres to these standards set by the EU. Some people do something. For example, they convert dryers to an alternative fuel. But it's not because they are following the principles of sustainable development, but solely to save on natural gas."

"The agrarian market is very pragmatic, so until the goals of sustainable development are clear and precise, rather than abstract, the understanding of sustainable development will remain at the level it is now - at a low level. Although all business entities, to varying degrees, implement certain aspects of sustainable development, they do not understand that this is sustainable development. Because for Ukrainian farmers, sustainable development is something abstract and incomprehensible, because there are a lot of words, but not enough specifics."

"I think it is small, to be honest. As for social or economic issues, there is much more awareness. As for environmental or governance issues, there is less awareness. Perhaps this topic really needs to be implemented, financed and supported in some way."

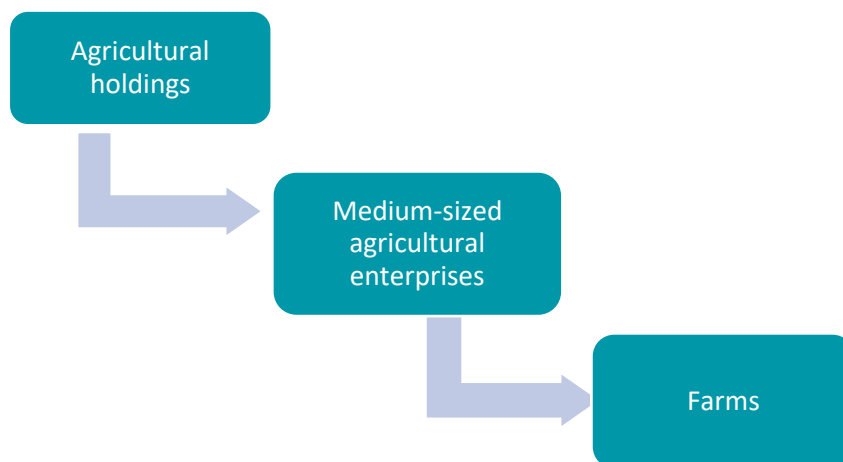
"The level of awareness is low. Only those companies that want to stay in the market and develop new markets, especially those in Europe, are engaged. Those companies understand what the requirements are. But, unfortunately, the majority do not."

"Most companies are aware of the sustainability goals and why they are being pursued. Another question is how many companies are actually taking steps in this direction. And here I would say that it is 10-15%."

Companies most involved in addressing sustainability issues

According to the respondents, agricultural holdings are most concerned with the implementation of sustainable development principles. Small farms are the least interested in implementing sustainability principles. The main reasons for the involvement of large enterprises in addressing sustainability issues are participation in supply chains with international companies, lending from international banks, and exports. Currently, small farms are mostly not involved in the implementation of sustainable development principles or do so only sporadically.

Figure 2. Current hierarchy of interest in addressing sustainable development issues according to respondents



Direct responses of the survey participants on the level of awareness of Ukrainian agricultural enterprises about sustainable development

"These issues are mainly dealt with by agricultural holdings. Small and medium-sized farms did not deal with this issue at all. In general, our country did not prioritise this area both before the war and now."

"The perception and understanding of sustainable development has not yet reached the lower levels of production. They do not understand it, it is not as popularised as it should be in developed countries. But even some things are done unconsciously."

"We believe that agriholdings are the ones who are the most important, because we are part of the supply chain of many international companies, we take loans from international banks that also monitor this issue, and we sell grain through global traders who also have these goals. That is why we are agricultural holdings that work on an equal footing with global traders, as part of the Western eco-system. But farms are too small to be part of this supply chain directly

"Agricultural holdings come first, because they are already present on the capital markets. And if you are present in the capital market, this is one of the questions you have to answer. Just to have better access, more access to certain things. In addition, agriholdings, because of their structure, can support projects, monitor them and do them systematically. In second place are farmers who, due to their size, have the resources to do this. In addition, they are closer to people and more socially oriented. Small farmers are not up to it yet."

"First of all, large companies listed on international platforms cooperate with the World Bank and the EBRD. Perhaps now those small companies that receive grants from our partners will join in. But as for farmers, no one knows or understands anything there."

"The bigger the company, the more interest, processes and actions are aimed at responsible social and economic behaviour, and the more money and time is invested in sustainable development. This includes reports for shareholders, investments in social projects, and assistance to communities. If it is a small or medium-sized company, there will be fewer actions related to sustainable development, because the budget and business profitability are also taken into account."

"Only large companies that attract investments, not just Ukrainian money, can talk about sustainable development. There are not many of them, and even these companies do not mention sustainable development anywhere. Companies that meet the criteria of sustainable development can be counted on one hand. This is because it involves investments that pay off not today, but in the future. In fact, sustainable development means money that will work for you for 5 years or more without being used directly."

"Agriholdings are more involved than small and medium-sized enterprises. This is because the culture of agriholding management is very developed and meets European requirements. In addition, the products exported from Ukraine are also certified, and global buyers also demand that Ukraine, sellers, and agriholdings comply with environmental or economic requirements. Agriholdings are more involved in this process than small businesses."

"Large companies, for which reputation is still an asset, as they have opportunities to enter European and global markets, have an initial understanding of sustainable development, but it is moving to the middle level. Each company has its own sustainability policy, and some have separate positions (such as Chief Sustainability Officer) in charge of this area. Each of these companies has been assigned an ESG rating, one of many ratings that provide this assessment."

"As for small and medium-sized agricultural enterprises, there may be no such need or it may be a specific need, for example, the need to produce grain that meets ICC qualities."

"Speaking for the overall market, all international companies are developing sustainability and it is a must-have for them. The vast majority of agricultural holdings are also implementing it."

Chapter 4. Implementation of sustainable development by agricultural enterprises before and during the war

The majority of large and medium-sized agricultural enterprises have been implementing the principles of sustainable development in their operations for several years.

There are two main areas in which Ukrainian enterprises are moving. These are the environmental aspects of sustainability through the implementation of technological solutions and social aspects. Economic aspects are also part of the mix.

Implementing environmental aspects of sustainability

Environmental aspects of sustainability in Ukraine are currently mainly achieved through technological solutions. More and more companies are switching to precision farming, minimal tillage, responsible crop rotation, changing technologies in line with climate change, etc.

Projects were also implemented to improve the efficiency of resource use (wastewater treatment plant, installation of solar panels, construction of biogas plants, replacement of old equipment with new ones to reduce CO₂ emissions, etc.

In addition to the use of technology, the environmental aspect of sustainability was ensured by the implementation of projects to reduce the harmful effects of the agricultural producer's business activities (collection and recycling of containers from used fertilisers or pesticides, protection of bees during the treatment of fields with plant protection products).

Direct quotes from survey participants on the implementation of environmental aspects of sustainability

"Sustainable development is more driven by technology: not to deplete the land, to do crop rotation, to move towards precision farming."

"The thing that has been done for 6-7 years is technological. We are gradually switching, where it makes sense, to minimum till, no-till or tillage, which is more economical, with less ploughing and more loosening. We are better at calculating the fertilisers we use so that the land does not degrade. Responsible crop rotation is very important: we do not, for example, sow sunflower after sunflower, which was a common practice in some regions of Ukraine. We comply with all safety rules when we have to use herbicides, we have very strict protocols."

"We have built a state-of-the-art wastewater treatment plant. The specificity of our enterprise is that we have a lot of waste, especially liquid waste. This system turns waste into clean water."

"We installed solar panels in 3 stages and planned to continue, but the situation in the country is now such that the focus has shifted to business survival rather than sustainable development. We are reducing the use of electricity supplied to us, which means more renewable electricity. This is one of our corporate goals."

"Many companies have invested in biogas plants as one of the elements of waste management to reduce emissions into the atmosphere."

"There is an EBRD project that includes several aspects. One of them is the transition to carbon-based agriculture, the second is taking into account climate change and re-equipping technologies, the third is the transition from using natural gas for drying to alternative sources in the form of briquettes, etc., and the fourth is replacing equipment such as Kamaz trucks with modern equipment that will produce less CO2 emissions."

"There is a project called AGROVARTA. It is a project that is being implemented on the basis of a European business association, which includes 8 international companies. We organised it on the principles of extended producer responsibility. This means that for pesticides or fertilisers produced in Ukraine by our companies, we provide a full cycle of handling this packaging from collection to recycling. This plastic is then used as if it were not involved in human activity. The project lasts for 2 years."

"Another area is bee protection. There were various information booklets, seminars were held to explain how fields should be cultivated and what measures should be taken to minimise the negative impact on bees."

Embedding social aspects of sustainability

All social aspects of sustainability can be divided into 3 groups: helping local communities, improving working conditions for employees and educational programmes.

Almost all farms help local communities, which are usually also shareholders. This includes honouring our commitments, supporting education, sports, healthcare, and providing financial assistance to community members in times of need.

Part of the assistance is not limited to financial injections, but includes the provision of tools for communities to meet their needs on their own. This primarily concerns assistance in setting up your own farm, various forms of cooperative movement, etc.

Improvements in the working conditions of employees have been observed in Ukrainian large and medium-sized agricultural enterprises for many years. Additional training is often provided.

In addition to training their own staff, companies were actively involved in educational programmes for future potential employees directly at the enterprise to improve their skills.

Direct quotes from survey participants on the implementation of social aspects of sustainability

"We have to be sure that we fulfil our obligations to our shareholders and communities. We provide social assistance, help to schools, local communities, and shareholders as needed. All this has been done for a long time."

"The way everyone works with their landlords/shareholders is a separate story. There are large farmers who cultivate 5-8-10 thousand hectares and they will be small social districts in the middle of the country."

"All large enterprises have their own charitable foundations and all cooperate with communities. They always support education, sports, and medicine. These are annual budgets that include about 1% of income. This is an element of social responsibility and competitive work in the countryside. This has been done for many years."

"Enterprises help local communities, villagers, invest in local schools, improve educational activities, and the welfare of the village. When they need to do something for the village, they turn to an agricultural producer because it helps the community to improve its facilities."

"Raised rent payments in the countryside, additional services provided by landowners, and a charitable contribution to schools, kindergartens, outpatient clinics, etc. was determined for each community. Every year these contributions increased."

"There is a great example: the Family Dairy Farm project in Ukraine. It involves private households in global business. People can open their own farms, and they are provided with the necessary means of animal protection, including medicines, and a system for selling milk. Everything belongs to this person and the scheme of this business is secured. They are more developed in western Ukraine, but gradually shifted to the centre and east of Ukraine."

"What we already have in place and that is in line with the UN principles is the cooperative movement. The company has invested in sewing shops to make bed linen for internally displaced people, and this can be called pure sustainability. This is the option when we do not give people money, we give people the opportunity to earn it on their own."

"Now companies are actively working to improve working conditions: food, accommodation, and working hours were acceptable enough for employees to be on par with European representatives, there was a worklife balance, there was no exhaustion, and there were more comfortable conditions. This is what all companies in Ukraine are doing now."

"Our company has been improving working conditions. Working with new equipment is physically easier and more efficient. It does not require round-the-clock work, as it was with old combines or tractors. A mechanic or combine operator working on old machinery looked dirty, covered in oil, because the machinery often broke down, was repaired, did not start or had other problems. Nowadays, a machine operator or a combine operator can work in white shirts and finish their work in the same white shirt. So, physically, the work has become easier. As for the economic goal, their earnings have increased, because with the higher productivity of this equipment, they have started to produce more hectares, and their productivity has increased in physical terms."

"As for the staff, internal training programmes are constantly being conducted. There were free English courses. There is also medical support for the staff, to ensure their health. These are elements of what a large enterprise always thinks about."

"We develop training within the company. We trained agronomists and machine operators using the company's resources. In our opinion, the more modern knowledge we give our staff, the more responsible and productive they will be with any resources. This happened

in winter, when plants are sleeping and people can study. It took about 1.5 weeks a year for 50 employees."

"In particular, the Agrokebety training project. Many agricultural companies have joined it. There are companies that provide financial support, while others contribute their expertise by giving guest lectures and taking students on an internship with possible future employment."

"Support for scientists and scholars on a global level at the Agricultural Youth Summit. Those who are interested have a special task and then have the opportunity to receive an award."

"Having realised that people don't know anything about animal welfare, we bring this information to them, and our Animal Welfare Officer has even written a book on the subject: how to treat animals. We promote this information among suppliers and agricultural businesses. I would like it to develop a little bit better."

Embedding economic aspects of sustainability

It was more difficult for respondents to identify economic aspects of sustainability, but they are also present. Respondents noted the purchase and use of the latest machinery and equipment, which leads to an increase in business margins due to more efficient use of production resources.

Direct quotes from survey participants on the implementation of social aspects of sustainability

"One of the company's development areas is sustainable supply, which includes antibiotics and animal treatment. Unfortunately, there are very few companies that comply with these requirements."

"New machinery that was purchased or new facilities that were built, they allowed us to increase the margins of the business. These investments are more automated and this has also improved the use of plant protection products or fertilisers, and we have started to apply diffusion fertilisers, which at the same time improves the environmental component of sustainable development. I believe that fertilisers are now used so

efficiently by Ukrainian companies that there is no longer such a gross overuse as there was before. Of course, this benefits the environment, and there are savings as well."

"I see a trend that more and more companies are seeking to renew their tractor fleet, combine harvesters, and seeders. They have updated the fleet and use modern technologies (GPS navigation, AutoTrac Universal, field mapping, spot fertilisation, automation of spray nozzles). The use of modern technologies reduces the burden on both the environment and humans. There are also financial savings (30-35%)."

The impact of war on the priorities of enterprises in the field of sustainable development

Since the beginning of the war, the contribution to sustainable development has slowed down, as the issue of financial survival of the farms has become a priority. And it is precisely during the war that less attention is paid to technology and more to employees, shareholders and local communities, as well as to support the Armed Forces.

In addition, since the beginning of the war, the specifics of the business, established over the years, have also changed. Agrarians are forced to quickly change their work algorithms due to the challenges caused by the war. First of all, this concerns the decrease in the financial capacity of enterprises and the expansion of alternative energy. However, this is happening against a backdrop of significant financial constraints.

Direct quotes from survey participants on the implementation of social aspects of sustainability

"Since the beginning of the war, this process has stopped. Ukraine produces 5 times more grains and oilseeds than it consumes. Accordingly, 80% of the products should be exported. Due to the inability to export in those volumes due to the closure of seaports, farmers were forced to reconsider crop rotation. This was noticeable during the sowing of spring crops and is especially noticeable now when sowing winter crops. The area under corn and wheat is being reduced in favour of oilseeds, which are processed in Ukraine. As a temporary solution during the war, this is the right step. However, it is likely that in some companies this may go against science-based crop rotation, which may further affect soil health."

"It's a war, so we are trying to preserve jobs as much as possible: we have not cut jobs or reduced salaries. This is done to preserve the team, families and everything related to it. Secondly, we have contractual obligations to our shareholders, to the people who have entrusted us with their land for cultivation. Thirdly, to our contractors, the state and other stakeholders. It is very important not to stop working and support the economy. But we still need to make certain adjustments to crop rotation, and it is not optimal now, it is not optimal all over Ukraine. We are forced to move to oilseeds at the expense of grains because the grain logistics are not working.

"As for the impact, we need to look at the territory. If a company is located in western Ukraine, it may be committed to sustainable development. If it is located in the north, where the occupied territories were occupied and where there are completely different problems, it is obvious that no one is thinking about sustainable development now, because the main issue now is survival. If you don't have money in your pocket, you don't think about whether to buy environmentally friendly products or those on the store shelf. Something similar is happening now in agricultural companies. If there is no money to survive, to get through the winter, to pay salaries, no one cares whether it is sustainable or unsustainable."

"The aid that used to be social aid is now being used by businesses to help the country and the army. The economic direction is to support business in the country. The environmental direction has not changed yet, those who have been complying with the standards are still complying with them, it is impossible to immediately change the quality system. Many companies still care about their employees, this factor remains and even improves during the war, because it is very good for an employer to show that they care about their employees."

"Now all our activities are aimed at supporting the country's economy, helping and donating to the Armed Forces, supporting our colleagues who are fighting for Ukraine."

"We are very supportive of the communities, the population and shareholders. The company always provides financial assistance to people, for example, if they suffer from shelling. These are both our shareholders and our employees whose homes were damaged by shelling. We also constantly support schools, even during the war, by financing or purchasing some equipment and materials. We finance the organisation of

folk or national holidays in the regions and so on. I think we are actively working on community development: repairing roads, repairing schools, supporting the TROs and the army."

"At the beginning of the war, the structure of the social budget completely changed: it was spending on helping refugees and the army, donations and charity, more than ESG criteria. Everything fell by the wayside, but we tried to make a kind of 'sustainability project'. Many people from the east came to our villages, mostly with technical education, and they know about equipment. We decided to launch a new project. We offered them 2 months of training with official employment and accommodation in our dormitories with a salary and meals, i.e. we took them away completely for 2 months. A separate group was created. They were trained so that we could retrain them in agricultural engineering and find a job in the western region."

"We are trying our best to develop recycling, because we have realised that logistics has a very narrow throat. The war has changed priorities a lot. The agricultural sector is now focused on economic survival. It's like Maslow's pyramid, where the priority is now on physical security, so that the business can survive. And sustainability issues are still more at the top of Maslow's pyramid, where less energy is spent now. When our logistics improve and don't cost 150 USD/t, when the business becomes profitable again, then something will change. To invest in the 'high stuff', the business must be profitable."

"During the war, the company has been experiencing financial difficulties due to a drop in production margins and problems with exports. Therefore, funding for programmes such as the construction of new facilities, automation or the purchase of new machinery or equipment has slowed down considerably. However, I would not say that companies have abandoned their sustainability goals, but the pace of implementation has dropped significantly."

"One of the activities that our company carries out is green energy and energy independence. We have invested in generators to ensure energy independence. In addition, we are implementing projects to install solar panels, and this energy is used for the needs of our agricultural enterprises. This is renewable clean energy. The company is actively developing in this area, including reducing energy consumption. This includes smaller investments, such as replacing motors that consume less electricity, replacing

scraper conveyors in elevators with belt conveyors, which consume significantly less electricity. This includes reducing heat losses in grain dryers, insulating them and taking other measures to prevent losses. Last year, we implemented a project to dry grain on sunflower shell pellets, which means recycling agricultural waste that is used for consumption by the same agricultural industry. It also reduces the cost of drying our grain."

"Energy efficiency and energy independence remain relevant even during the war. The company has invested in the construction and installation of solid fuel generators to achieve independence from natural gas for grain drying. And as far as I know, such solid fuel generators continue to be installed even during the war in many agricultural companies. This increases energy efficiency.

Key stakeholders of agricultural enterprises

The main stakeholders were residents of local communities, who are usually also shareholders.

Direct quotes from survey participants on the implementation of social aspects of sustainability

"For large enterprises, the main stakeholders are primarily shareholders, and they pay attention to them the most."

"The priority stakeholders are still the residents of the community in which we operate and are located."

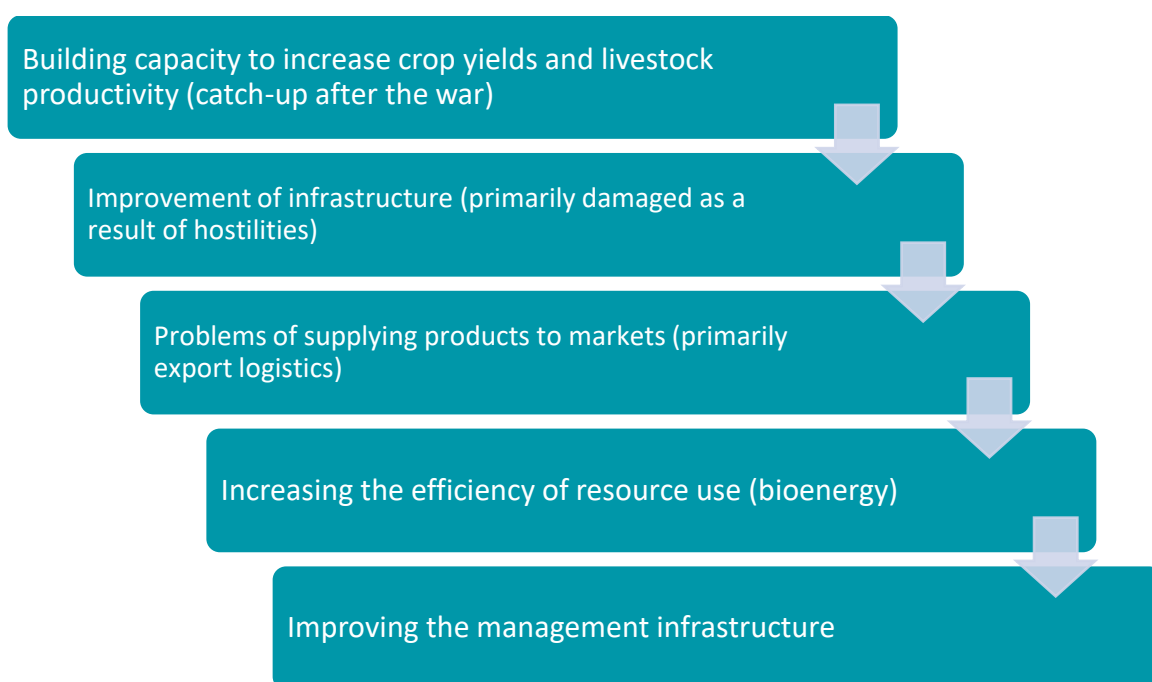
"In general, stakeholders are employees, customers, suppliers, and banks. Also shareholders, local communities. However, during the war, employees also became one of the main stakeholders. I am referring to the procedures for reserving people liable for military service. Due to the war, men are being booked because there is a lack of labour to fill certain positions. And of course, the customers to whom we sell our products. Being in a good and trusting relationship, it is possible to fulfil both forward and spot contracts. Since the beginning of the war, grain acceptance at the port has slowed down or is sometimes impossible, and as we are looking for new buyers in Europe, it is extremely important to establish new relationships with new buyers in the border regions of

Romania, Slovakia and Poland. We spent six months establishing these new relationships with new customers."

Section 5. Investment needs of Ukrainian large and medium-sized agricultural enterprises

According to the respondents, the investment needs of Ukrainian large and medium-sized agricultural enterprises are as follows (in descending order of need).

Figure 3. Priority investment needs of the Ukrainian agricultural sector



Building capacity to increase crop yields and animal productivity

The reduction in liquidity of Ukrainian agricultural enterprises due to the war has led to a decline in crop yields, and it will take both time and additional investment to restore these indicators. This is due to a decrease in fertiliser use, non-compliance with technology, and deterioration in soil quality. It takes both time and additional investment to restore yields.

Improving infrastructure

The hostilities in Ukraine have destroyed a significant number of infrastructure facilities (roads, bridges, ferries, elevators, etc.) that need to be rebuilt. In addition, the

destruction of traditional logistics routes (grain storage and transshipment infrastructure on the western borders, new facilities at the Danube river ports, etc.) has created an additional need for new infrastructure. Land reclamation in the south of Ukraine remains a painful issue, requiring at least some kind of rehabilitation, if not expansion.

Challenges in supplying agricultural products to markets, including logistics and product quality and safety

Export logistics has been the most painful topic for Ukrainian farmers for almost a year now. Now that there are almost constant risks of blocking this channel, it is necessary to develop alternative routes to prevent the complete blocking of Ukrainian agricultural exports.

In addition, there are questions about the safety and quality of products due to constant power outages caused by Russian shelling of the Ukrainian energy system. To avoid this risk, it is necessary to develop alternative energy sources.

Improving the efficiency of resource use (water, energy, etc.)

The company is primarily interested in reducing its energy dependence on natural gas and increasing the use of alternative energy sources. In principle, these processes started during the war, but they will also be relevant in the coming years.

Improving the management infrastructure

The war has led to significant changes in the labour force: some Ukrainians have left the territory of Ukraine due to the hostilities, and some men are currently serving in the Armed Forces. After the war is over, and during it as well, it is necessary to invest in attracting the best employees and improving the management infrastructure.

In addition to the investment areas mentioned above, respondents also mentioned the need to invest in education, laboratories, and in regulations and legislation.

Other areas of investment

In addition to the investment areas mentioned above, respondents noted the need to invest in education, laboratories, and in regulations and the legal framework.

Direct quotes from survey participants on investment needs

Building capacity to increase crop yields and animal productivity

"We are interested in a certain balance of costs and yields. Improving the technology is more important. The two technologies we are trying to implement are mini-till and no-till, and where it makes sense, we need to use irrigation. We have this opportunity, we have water resources and we need to do this in the south."

"During the war or after it ends, there should be a transition to new equipment. The equipment that works on the field changes every 5-10 years and this process should not stop. If agriculture continues to work with double the effort now, the process of investing in maintaining harvests should continue. But at the same time, this harvest can be obtained with minimal soil destruction, so the process of replacing agricultural machinery should continue."

"Now everyone has reduced the use of fertilisers and is not following the best practices, so in the coming years we will need to invest billions of dollars to return to at least the pre-war level. The question will be whether there will be quality subsidies and support for the transition to sustainable production. If this is not the case, companies will continue to struggle to survive, as there are huge liquidity problems and no one will borrow additional money from banks to invest in sustainable production."

"We have sustainability goals, such as soil health and decarbonisation. The war has caused major environmental problems and we are looking at what we can do in this area. Together with international funds, we are looking at what we can do for demining, because this problem will be around for several years."

"Regenerative farming is no longer a reversible process, not this year, so next year, we will all use it."

"We need to invest in precision farming, organic farming (this means passing certifications, changing equipment)."

Improving infrastructure

"There is a huge need for investment, starting with improving the infrastructure, because many infrastructure facilities have been destroyed, from roads, bridges, ferries, elevators, etc. Infrastructure facilities will need to be improved by themselves."

"If a farmer has better access to transport, logistics and export infrastructure, he has more money left over. If he spends/loses less, he has more money for other important things, such as technology."

"Improving infrastructure is one of the main problems. We need to improve our roads, not just the central highways. Now that the war has started, those who live in big cities have really felt the problems of infrastructure in small villages when they started moving to other regions."

"Infrastructure projects are also very interesting. The recent privatisation of the Danube ports, various terminals in Odesa, as well as infrastructure for grain storage at the border or grain transshipment at the Ukraine-EU border."

"More attention needs to be paid to improving infrastructure, such as land reclamation. As for bioenergy, there is also the issue of infrastructure for connection: whether it is a connection to the grid (in the case of electricity generation) or a connection to a gas pipe to pump biogas into the system. If this connection is made at the expense of the enterprise, it will be much more difficult, but if the state or donors help develop the infrastructure, it will be much better."

Challenges in supplying agricultural products to markets, including logistics and product quality and safety

"Today, logistics is the first stumbling block that everyone stumbled over and realised that everything is not as good as it seemed. Now it has become clear that we have a very small window for selling products, which can close very quickly. We sell only across the sea, and everything that goes by land and through rivers doesn't work. Although this activity could be possible, it has never been worked on in any meaningful way."

"Logistics has become key because it is access to international markets. Logistics costs are rising and will continue to rise because of the price of fuel, risks, and the increase and change of routes. Never before have we transported grain by road for thousands of kilometres. Usually, we used to transport it by road within elevators and neighbouring areas, at a distance of 150-200 km at most, and now it is being transported from Kharkiv to the Danube ports."

"Of course, investment in logistics, which includes different types of transport, both rail and road. Some types of companies have considered water transport for themselves."

"In livestock farming, in order for milk to be safe and of high quality, it needs to be stored. This requires electricity, which is not available now. This raises a lot of questions about milk quality. There are huge problems for companies that store berries for export, as they also have huge electricity needs."

Improving the efficiency of resource use (water, energy, etc.)

"We had and still have large-scale plans to build a bio-methane plant. We have a dairy farm and cow manure, which can be utilised better with the help of a bio-methane plant. We also wanted to add corn biomass."

"For our company, this means energy efficiency, energy independence from gas and the possibility of further processing of agricultural waste."

Improving the management infrastructure

"We do not understand what kind of staff we will have after the war, because a large number of Ukrainians have left Ukraine, a large number are now fighting at the front, including men who were directly involved in the work. Therefore, we can only guess what kind of management infrastructure we will have after the war is over."

"New practices are very important. That is why companies that have already rebuilt their corporate structures allow them to do systematic work on implementing new practices. If new practices are implemented, labour productivity will improve."

Other areas of investment

"First of all, we need to invest in educational activities, in physical technical equipment, laboratories that allow us to meet all the requirements that products must meet in the EU. Our customers prefer European laboratories for product quality, as there are few such laboratories in Ukraine."

"The needs listed above are all necessary, but the most important thing for Ukraine is regulatory requirements that are the same for all players. Unfortunately, this is not the case with us yet."

"Investments in the legislative framework, because we have outdated sanitary standards, all these things need to be adapted, and this is a kind of investment."

Chapter 6. Drivers of investment and sustainability initiatives

Key incentives for investment in sustainable development of agricultural enterprises

According to respondents, the main driving force behind the introduction of sustainability initiatives by Ukrainian agricultural enterprises is the possibility of selling their products to global companies or exporting them to the EU. However, the need to attract additional foreign capital also stimulates the transition to sustainable development.

Direct quotes from survey participants on the main incentives for investing in sustainable development

"Participation in the supply chains of global companies comes first. First of all, you have to meet their requirements, otherwise you won't be able to sell your products. And only then, to finance our own activities, we have to meet those requirements in terms of finance. This includes banks, stock exchanges and EU rules if the company is registered in a European jurisdiction. But first and foremost, agricultural companies must meet the requirements of their customers."

"The desire to sell will force us to adopt the principles of sustainable development. But whether we can meet these principles is a question."

"There are also requirements for exporting products. Because when we export, we have certification, and we comply with the requirements according to this certification. And it definitely stimulates us."

"After Ukrainian farmers started exporting more grain to the EU, they started thinking about what crop protection products they use. We know of many cases where export contracts with German companies clearly specify almost 200 analyses that must be done. Therefore, there is an improvement: there is an understanding that if you work with the European Union, you need to think ahead about what crop protection products you are working with."

"The ESG criterion is a criterion for socially conscious investors. Investment banks and institutions such as the EBRD and the World Bank, which really use metrics to assess the riskiness of a business. Then companies are in competition for capital. If one company has both a rating and a strategy, and the other does not, then of course, preference will be given to the company that meets and takes steps towards sustainable development goals. I think this is the biggest driver in Ukraine so far."

"I think that the topic of sustainable development will come to life thanks to financial instruments and the fact that companies engaged in sustainable development will have different investment conditions than other companies that do not spend money on it. Because in business, you need to make a profit, and a sustainable development business model is more expensive than not thinking about this issue. Therefore, there will be no great progress without bankers."

"The need to meet the requirements of international financial institutions, which are very active in financing either directly or through Ukrainian commercial banks."

"There are three driving forces:

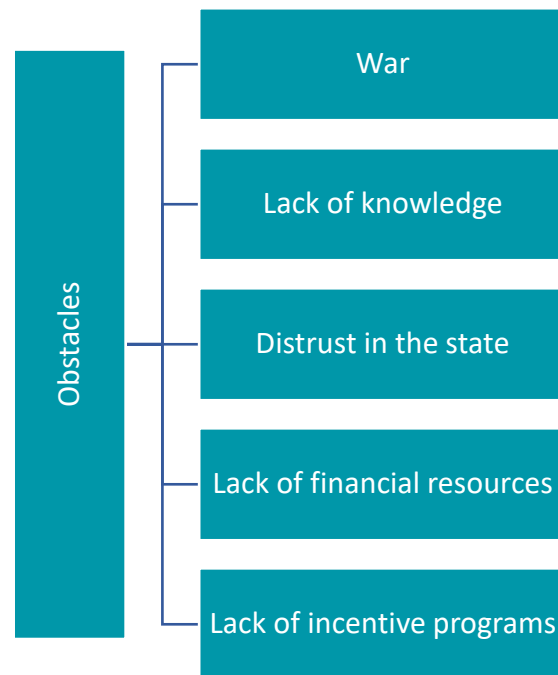
- It has to be profitable, because investors will only invest in something that pays off;
- It should be a requirement, and without it, it will be impossible;
- It has to be very fashionable.

"You can add the driver of the company's image, the commitment to principles on the part of the company owner."

Barriers to investment in sustainable development

The main barriers to investment in sustainable development are listed below in descending order of importance.

Figure 4. Hierarchy of obstacles to the implementation of sustainable development principles



War

The main obstacle to investing in sustainable development was the ongoing war in Ukraine. Unfortunately, it is causing incredible damage to the Ukrainian ecological system, economy, and population. As long as the war continues, investments in sustainable development are ineffective.

Lack of knowledge

Unfortunately, the lion's share of Ukrainian farmers do not understand what sustainable development is and why it should be done. Without a high-quality educational programme, investments in sustainable development will not be made.

Distrust of the state, corruption

Ukraine still remains a high-risk country with a high level of distrust in the state and corruption stories. This factor does not allow for free investment in sustainable development.

Lack of financial resources

Ukrainian agricultural companies are currently facing significant financial challenges due to export problems, low domestic prices and rising input costs. In such circumstances, it

is difficult to allocate funds for investment projects, which often do not have a quick payback.

Lack of incentive programmes

Quite often, additional incentive programmes are needed to implement certain programmes that do not pay off quickly. Unfortunately, there are none in Ukraine at the moment.

Direct quotes from survey participants on barriers to investment in sustainable development

War

"Sustainable development is about modern technologies that have less impact on the environment, modern farming, and the use of innovative technologies. But this requires ending the war, and mine clearance is also a problem for farmers. Every day we hear about tractors being hit by mines, and this problem will slow us down for another 5-10 years."

"First and foremost, we need to stop the war, and then rebuild what we have come to in terms of the potential for further sustainable development."

"The main obstacle now is the war. No one will talk about it until the war is over."

Lack of knowledge

"No one understands the sustainability requirements of the agricultural sector."

"The main obstacle is a lack of knowledge, because not everyone understands what sustainable development is in principle."

"No one is fighting against the low awareness of the need to implement sustainable development goals. We are still moving into the EU and will compete in the market with companies that have already implemented all these standards. There is very little educational work, very few regulatory and explanatory acts, few requirements that somehow encourage companies to listen."

"Lack of understanding of the benefits, awareness, lack of understanding of 'why to do it'."

Distrust of the state, corruption

"The state has not fulfilled any of its obligations to investors in recent years. The state, together with its corrupt controlling bodies, does not allow any investment business to be conducted in Ukraine. And this is starting with the payment of taxes, in terms of compliance with the law, compliance with the state's obligations under the green tariff, etc."

"Ukraine is a high-risk country and it is more expensive to raise finance than in the EU, so there has been less investment. Ukraine also has very short-sighted rules for foreign investors (you can't predict what the government will come up with to discriminate against foreign investors)."

"Unfortunately, the level of corruption in our country does not always attract investors. Investors need to be sure where their money is going and see the results."

Lack of financial resources

"Lack of financial resources, because all programmes do not have a quick payback, and some do not pay off at all. That's why it really needs to be stimulated through funding, international financial institutions."

Lack of incentive programmes

"If sustainability standards are adopted, but there are no incentive programmes, then the programme will remain unimplemented."

Investing in sustainable development on your own and the motivations behind it

"The desire to enter new markets where there are certain requirements for enterprises. This is what encourages agricultural enterprises to switch to new standards."

"To be honest, I don't see any big investments there. The only thing that can be noted is that before the war, the rural population often complained that too much plant protection products were used, which caused health problems for people and killed bees. So there was a discussion at the local level about how chemicals were used and where

they should be stored. In this regard, there has been progress, many agricultural companies have started investing in professional warehouses, and plant protection products are applied exclusively at night. The rural population has a negative attitude to the use of chemicals in general, so this process will not stop."

"At this stage of the implementation of European legislation, instrumental motives will have a greater response."

"It can be an economic benefit, coincidence of goals and directions of sustainable development and increase of economic efficiency. Avoidance of certain negative consequences or acquisition of certain positive features for business (care for communities, rural population, landowners), ethical issues are more in the background."

"There is also an ethical issue. Everyone works under lease agreements, we want the lease agreements to be extended, we want the company's image in rural areas to be positive, so there is an ethical side to it."

Section 7. Sustainability certification and information disclosure

According to the respondents to this study, there is no clear understanding of sustainability certification in Ukraine. A limited number of Ukrainian companies are aware of their existence, either by supplying their products to global players or by cooperating with international financial institutions. Other certifications that are related to the topic of sustainable development are mentioned.

The situation is similar for sustainability reporting and measurement. There is an understanding that public companies provide data on their sustainability goals, but few people know the details.

Direct quotes from survey participants on sustainability certification and disclosure

"The standards are not used and no one really knows about them. If someone is supplying potatoes to PepsiCo, they have to use those standards."

"No, it's not about us. There is simply nothing in our legislation. We meet all the criteria required by the EU or other countries to export products. We fulfil those that are required. But these are not our Ukrainian standards, we have nothing about it at all."

"Many holdings have switched to IFC certification, which entails some principles of sustainable development. They also received GMP and HACCP certification - these are regulations that do not mention sustainable development, but the principles of sustainable development are there."

"GLOBALGAP, ESG and Organic are used".

"I've heard of GLOBALGAP, but I've heard almost nothing about the rest of the above. GLOBALGAP is not very common".

"I planned to implement and sign the UN Global Compact, to report to them on the implementation of specific sustainable development goals that we had set for ourselves. Then there are the IFC standards. There is a guide on how to implement them. Of course, we as a company plan to report on the results of our ESG strategy, and for this purpose I chose 2 standards: SASB standards and GRI standards. These are standards for disclosure of non-financial reporting."

"I don't know at all and have never even heard of it. I don't know of any criteria that can be used to say whether a company is sustainable or not. I know most company managers by sight, and they will say the same thing. Of course, we can now say that we cooperate with large companies that conduct audits, provide us with reports, and invite us to evaluate our activities. But if we are talking about voluntary standards and how they are spread in Ukraine, I am not aware of such standards, they are not widespread in Ukraine. When we talk about the global level, when we want to enter new markets, we invite companies for an audit."

"I have not heard of sustainability reporting. Organic - yes, they report."

"The largest companies report to international financial institutions, and they have a special form of report."

"I cannot say anything. The only thing I am sure of is that agriholdings publish reports for investors, and these reports contain monetary figures for how much has been

allocated for certain projects, or they report on participation in a project, such as biofuel, waste recycling from chicken farms. I don't know any specific indicators in our business. The only thing I know is that 100% of warehouses should have sanitary transport."

"To get this certification, companies undergo a lot of checks, and this is the only reporting. Any other reporting and measurement of sustainability is currently a rather abstract issue. I know that there are some initiatives in some companies to create certain calculators for certain aspects of sustainable development. But we don't know of a specific functioning calculator for measuring the sustainability of a business yet."

"Most Ukrainian companies have joined the UN Global Compact, and each of them publishes a sustainability report on its website, showing how they affect the environment. At the same time, what distinguishes our agricultural companies from Western ones is that our companies do not publish metrics, i.e. what specific goals they declare to achieve for each of the standards for the next year. In Ukraine, progress reporting is still descriptive, with less clear goals, achievements and progress."

Chapter 8. Preparation of Ukrainian agricultural enterprises for European integration in terms of sustainable development

Political readiness of the process of preparing Ukraine's agricultural sector for the implementation of the requirements of the EU Green Deal/ CAP within the framework of European integration

According to respondents, the process of preparing Ukrainian agricultural enterprises for European integration is still rather inactive and gradual. This topic is constantly raised, but there is no clear understanding who claim that the situation is much better than it seems.

Direct remarks of the survey participants on the political readiness of Ukraine's agricultural sector to prepare for the implementation of the requirements of the Green Deal/ EU CAP within the framework of European integration

"So far, few people are worried about it. Someone has read about the Green Deal somewhere, but no one really knows the details. In most cases, there is no understanding of what the Green Deal is and why it needs to be implemented. When Ukrainian companies think about joining the European Union, in most cases it is infrastructure assistance, some subsidies per hectare, but absolutely no one thinks about the requirements that Ukraine has to meet in order to join. First and foremost, it has to meet the requirements for agriculture."

"In the last year before the war, there was a lot of talk about the Green Deal, conferences and meetings. Large enterprises understand that this will happen at some point, and they have already implemented the principles of the Green Deal in their production technology: they changed the use of various fertilisers and chemicals, and refused to use chlorpyrifos, which is banned in the EU."

"Farm to folk is not very applicable for Ukraine. Our fertiliser application rates are not that high. We are already in better conditions than in Europe. But the target of 25% organic is impossible to achieve."

"Maybe someone on the sidelines is talking about the need to organise and promote this, but everything has probably remained at that level. I'm not a politician, I don't talk to politicians about this, but if I'm the person for whom this should be created, then for me it's a dark forest right now. So, I'm not advanced in any way."

"In fact, this process is much more advanced than it seems, the situation is much better than it seems. Because the market has been preparing for the EU requirements for a long time, so the talks started a long time ago, and with the adaptations that are being made now, this integration will be faster and easier than we think. Because we have been ready for many years."

The impact of war on the process of preparing Ukrainian agricultural enterprises for European integration

There is no clear answer as to whether the war has had a positive or negative impact on the process of preparing Ukrainian agricultural enterprises for European integration in terms of sustainable development. On the one hand, the war accelerates the desire to

enter the European market. On the other hand, most companies are now struggling for physical survival and have no time for European integration.

Direct remarks of survey participants on the impact of the war on the process of preparing Ukrainian agricultural enterprises for European integration

"The war will slow down this transition for some companies, and speed it up for others, because the desire to enter the European market to reach direct consumers will force companies to meet EU requirements."

"The war has really slowed everything down, because everyone is thinking about survival. You live somewhere, and that's fine."

"Those companies that have started to enter the European market have accelerated in this process. But this is a small percentage of very progressive companies. If we look at the Ukrainian agribusiness as 100%, then 5% of progressive companies that are trying to gain a foothold in the EU market after restrictions on food exports were lifted have started to move. And the other 95% of companies are thinking about survival and have gone backwards in this regard. An even bigger gap has emerged."

"On the part of agricultural enterprises, it almost stopped it, and on the part of the legislature, it accelerated it."

"The war accelerated all the processes. Many issues have become more active with the candidate. In each committee, committees have been set up for European integration."

Readiness of Ukrainian agricultural enterprises to meet the requirements of the Green Deal

There is also no consensus among experts on the readiness of Ukrainian agricultural enterprises to comply with the requirements of the Green Deal. Additional incentives and clarifications are needed.

Direct comments from survey participants on the readiness of Ukrainian agricultural enterprises to meet the requirements of the Green Deal

"Ukrainian enterprises are very ready, they will even welcome such standards or requirements. Due to the fact that Ukrainian agricultural enterprises are integrated into the global economy, they are very ready for implementation."

"Big companies are ready, small ones are not. As for working on the requirements of sustainable development. It all depends on the task and requirements. Small companies need to see the benefits they can get or the stick they can get in the form of legislative requirements."

"Businesses need to be interested, just as enterprises in Poland and Germany were interested when it all started. It's all about business. If you comply with certain rules and regulations for sustainable development, you get some additional bonuses. If you start producing biofuels, you don't pay excise duties on petroleum products. If you save CO₂, you get bonuses for something. If you do a crop rotation that meets the criteria for sustainable development, you get a subsidy for each hectare of land. This should not be forced, but voluntary. To do this, companies need to be interested in doing this."

"This needs to be done very gradually, because this year the entire agricultural sector has not thought about these issues. Because when you don't know where to sell your grain, you don't have money and you have corn in the field in December, the issue of sustainable development fades into the background."

Steps to be taken by the Ukrainian government to accelerate the process of adapting the requirements of the EU Green Deal/ CAP to Ukrainian agricultural enterprises

According to the respondents, in order to accelerate the process of adapting the requirements of the EU Green Deal/ CAP to Ukrainian agricultural enterprises, the Ukrainian government should amend Ukrainian legislation and do so with due regard to Ukrainian realities, as well as communicate their principles to both Ukrainian agricultural enterprises and end consumers.

Direct remarks of the survey participants on the steps to be taken by the Ukrainian government

"We need to change the legislation completely, adjusting it to European conditions. And this is about 40% of all regulations related to the Green Deal or food safety, and they

need to be revised, communicated to producers, and then implemented. This is a huge amount of work. Unfortunately, many people do not understand this."

"First of all, it is the adaptation of the legislation, and then a transition period so that there is time for agricultural producers and farms to transition and prepare for the norms."

"We need to work on communicating the essence of the Green Deal to Ukrainian agricultural producers."

"We need a healthy balance, because the agricultural economy of Europe and the agricultural economy of Ukraine are different agricultural economies. There are no holdings of 30 thousand hectares in Europe. The average holding in Italy is 3-4 thousand hectares, which is considered quite large. Legislation adopted in Europe must be adapted in Ukraine in a very, very balanced way. The pesticide load per hectare in Ukraine is 3 times less than in the Netherlands. Therefore, our standards are sometimes higher. Under the Green Deal, one of the points was to reduce the use of pesticides by 50% by 2030. We don't need to reduce it because we haven't used that much. We need to be quite careful about this issue, taking into account that we also care about our end users. For example, when we were preparing legislation on amores (residual amounts of pesticides in crops), we had stricter rules than the Ukrainian standards. That is why working groups are being set up and these directives are being analysed quite closely. You can't just translate the legislation and adopt it."

"I think that the relevant departments are engaged in the implementation of European legislation. They are the ones who write new regulations, requirements and recommendations. Before implementing and adopting anything, it would be nice to publish and present it before approval. To take educational measures. They should make this work easier for business."

"It is necessary to set goals so that businesses understand what they should strive for. At the very least, the Ukrainian government should provide analytics on the status of implementation so that everyone can see the percentage of the target being met."

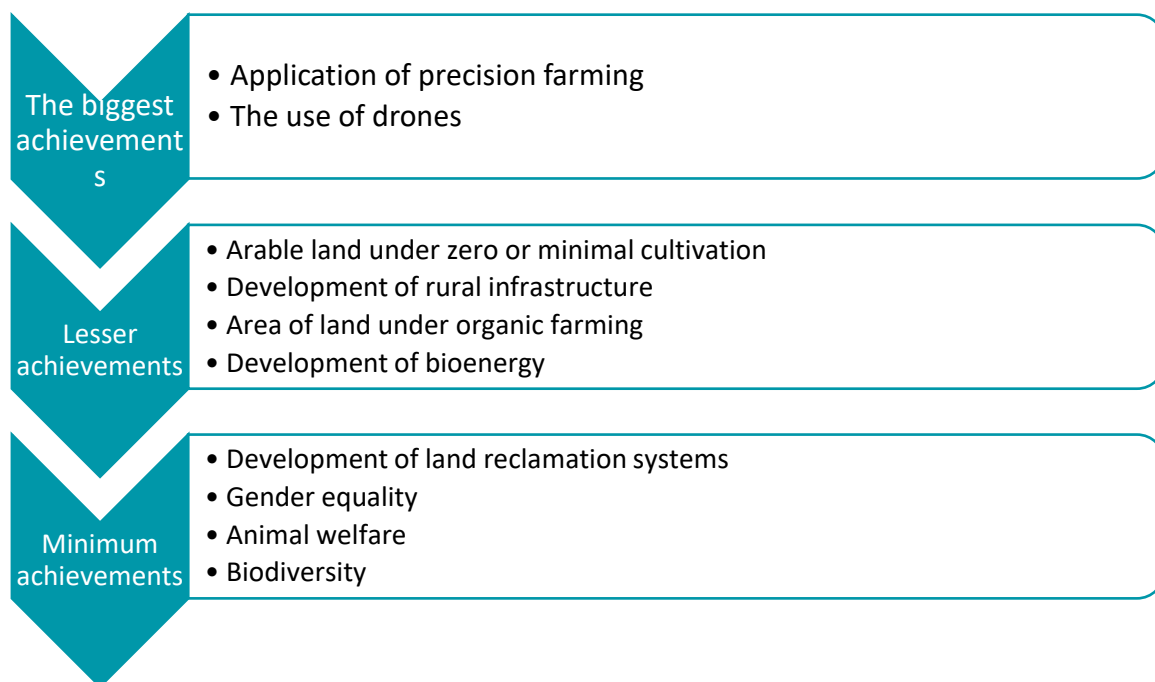
"First of all, they should not only communicate the principles of the Green Deal to businesses, but also to end consumers, explaining what it will bring them. When people understand what sustainable development is and what its benefits are, they will demand

that companies meet these standards. Until this happens, the transition process will be rather slow."

Section 9. What are the current (or, if it is difficult to estimate, then pre-war) results of Ukrainian agricultural enterprises' investments in sustainable development?

According to the respondents, it is difficult to identify the results of investment in sustainable development in absolute terms, as this is not recorded anywhere. In general terms, the main results of agricultural enterprises' investments in sustainable development are as follows.

Figure 5. Gradation of results of investments in sustainable development by agricultural enterprises in Ukraine



Direct comments from survey participants on current investments of Ukrainian agricultural enterprises in sustainable development

Application of precision farming

"In the pre-war period, we observed that many farms invested in precision farming. First of all, it is a differentiated fertiliser application that helps to save on fertilisers, so now it

is even more relevant. Differentiated application of plant protection products, which helps to reduce the pesticide load and at the same time saves money. And differentiated sowing, which also allows us to save on seeds without losing yields. There is a lot of investment in precision farming. They will also continue."

"Over the past 5 years, large companies have made a strong breakthrough in this and have made big steps towards advanced technologies and invested there. 90% have switched to technologies that use systems that were not available 5 years ago, ranging from satellite-guided navigation to unmanned technologies. Over the past 10 years, we have changed our approach to agriculture, and companies are investing in it quite actively and will continue to do so. Everyone is investing as much as possible in this, investing less in social projects or real estate than in unmanned technologies and other modern technologies."

"The precision farming system is already used in our country by about 90%. Five years ago, it was used by 0%. We have purchased equipment for differential application, and a lot of automation has been done. Now agronomists are working remotely to develop differential application based on the soil analysis we have done. We have invested a lot and done a lot of work in terms of soil analysis to make differential fertiliser application based on it. We also purchased a lot of machinery, additional equipment to do differentiated sowing, because we have variegated soils. This is to ensure optimal sowing with efficient use of our resources. In addition, we have different sowing on fields that have potential and those that do not. This is where we calculate how much inputs we need to apply in each area of the fields. In this regard, our company and many agricultural holdings have done a great job in this area. And Ukraine is now at a very high level."

Production areas of land under drone/satellite surveillance

Such technologies are used only by large agricultural holdings, as, according to respondents, they are expensive and not all enterprises can afford them. However, the presence of a large number of agricultural holdings in Ukraine ensures that these technologies are well represented.

"Precision farming is quite expensive, so few companies are fully switching to precision farming, and some companies are partially implementing it."

"In terms of the use of drones or satellites in production, Ukraine is in a leading position compared to many European countries. This is because Ukraine has agricultural holdings, while the EU has small farms that use these technologies less. It is easier for them to see what is happening on 100 hectares, while we have large areas."

"100% of our land is monitored by drones or satellites. I believe that the situation is similar for Ukrainian agricultural holdings in general. We also use drones to diagnose and monitor the condition of plants, and we also use them to apply plant protection products on a targeted basis, which reduces the use of these products and has a positive impact on the environment."

The area of land under zero or minimal farming.

There is no real estimate of the area of land under this type of cultivation, but these technologies have begun to be used in part.

"The south of Ukraine is most often under minimal cultivation. Real zero is very little today." Precision farming is quite expensive, so few companies are fully switching to precision farming, some companies are partially implementing it."

"In our company, about 10% of our land is already minimally cultivated, and we have invested in this, bought special equipment, and invested in the precise signal required to use this technology. As a result, we have reduced soil erosion, reduced fuel consumption, reduced fertiliser consumption because fertiliser is now applied in a row for seeds rather than in a single layer, and reduced use of herbicides, which are also used in a spot manner. Our company has taken a lot of steps in this regard. All large agricultural holdings have come a long way, achieved great goals and are ready to continue developing in this direction."

"In terms of minimal or no-till farming, not all land in Ukraine is suitable for these methods, because the crops simply won't grow or won't yield the yield needed to cover the costs. Our company tried to implement it in Donbas, but the results were disappointing."

"Zero-till farming is a very small percentage compared to Latin America and Australia. The whole world is moving to regenerative farming, and it is important for Ukraine to accelerate its efforts."

Volume of investments in rural infrastructure by enterprises

Many companies are investing in this area, as they operate directly in rural areas and all shareholders actually live in these areas.

"A lot is invested in rural infrastructure, a lot of contributions are made to the development of rural areas. About \$100 per hectare is invested in rural infrastructure in various forms (from road reconstruction and repair to schools). Previously, it was \$20-30."

"Each large company has its own budget for the development of rural areas/communities."

Land area under organic production

This is one of the few indicators that was assessed. This is due to the fact that there was a programme for the development of organic farming at the state level and I have a rough understanding.

"There are approximately 500 thousand hectares of land under organic production."

"Ukraine is already one of the main suppliers of organic products to the EU. However, if we talk about 25% of production being organic, it will not work, because it is commercially unprofitable. There are not many buyers who are willing to pay extra money for organic products."

The amount of investment in bioenergy.

According to respondents, the volume of investments in this area will increase after the war started by Russia.

"Investments in bioenergy have increased because everyone understands that it will continue to be difficult to get gas from Russia in terms of price and availability. Therefore, investments in this area will obviously increase."

"In the last 2 years, bioenergy has grown a lot. Gas prices have forced it. Bioenergy will continue to grow very significantly."

The amount of investment by enterprises in reclamation systems.

The Ministry of Agrarian Policy and Food had been making this area a priority, but the war forced them to change their plans. Moreover, reclamation is needed in the south of Ukraine, where either the fighting is ongoing or the front line is quite close.

"The Soviet reclamation systems were destroyed and this is a priority for the agriculture ministry, but we have not seen much investment here."

Gender equality

"Agricultural production is more associated with physical strength, so I separated the administrative staff. There are 48% of women in the administrative staff. In this respect, the company is committed to gender equality. As for the non-administrative staff, it is only 22%, and this is due to the need for physical strength. We have women working as accountants, weighers, and warehouse managers. We engage women in non-physical labour."

"Women agronomists have appeared and this can be added to the victory."

The amount of investment in animal welfare. The principles of sustainable development were hardly applied in this area.

"There was most likely no investment in animal welfare."

"The big question is what standards we work to. There is a wide variety of animal welfare standards in the EU. Unfortunately, there is no single standard that we should rely on."

Biodiversity. Unfortunately, the issue of biodiversity is hardly developed in Ukraine because there are no incentives for it.

"There should be some kind of state programme on biodiversity, because it won't work like this."

"We can talk about amounts in the hundreds of millions of dollars, but it's not billions. But these are absolutely tiny amounts compared to the scale of the state and the investment opportunities that could be made. In recent years, the hundreds of millions of dollars that Ukrainian enterprises have invested in their programmes are not that big. And it was their own money."

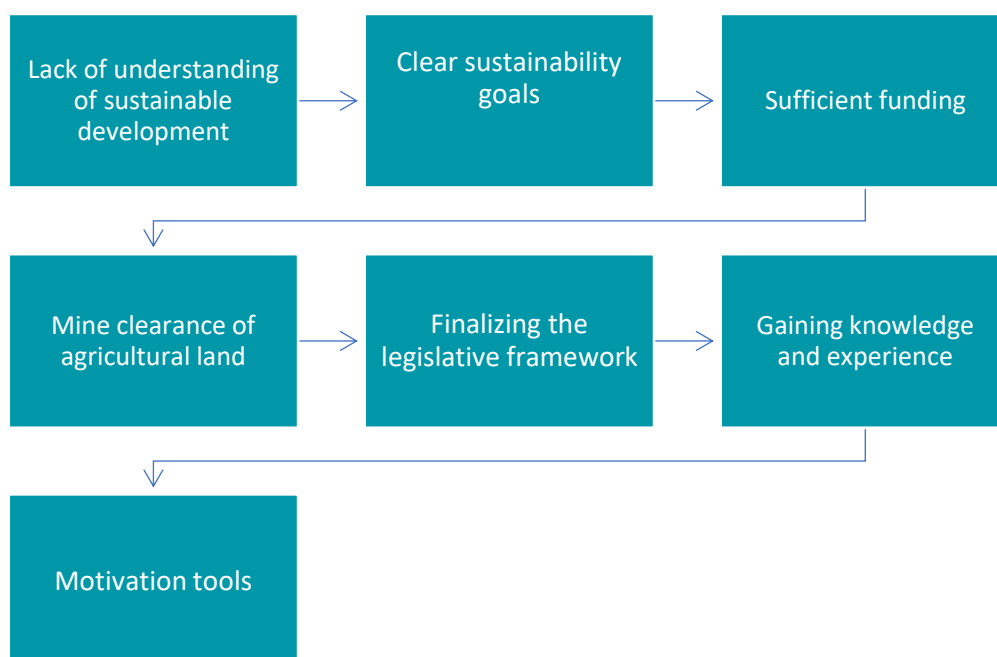
"Over the past 10 years, our company has invested USD 67 million in sustainable development. It was the construction of new facilities, including livestock facilities, where the conditions for keeping animals are the best, according to European standards. And new equipment, which I have already said a lot about and what it is for. It's hard to say about Ukraine as a whole."

Chapter 10. Assessment of potential, existing challenges in implementing and managing sustainable development approaches after the end of the war

Almost all respondents understand that Ukrainian agribusiness has no other option but to implement the principles of sustainable development after the war to be able to integrate into the EU . And this process is reversible: without integration into the EU, sustainable development in Ukraine will not be implemented further.

However, respondents immediately pointed out that will be a long, complex and expensive process. And there will be a huge number of challenges of various kinds that will need to be addressed.

Figure 6: Challenges in implementing sustainable development approaches after the end of the war



Lack of clear understanding of sustainable development by Ukrainian agricultural producers

The presence of a large number of farmers on the Ukrainian market who have a very rough idea of what sustainable development means requires, first and foremost, explanatory work.

Clear goals for sustainable development

The best way to improve understanding of the principles of sustainable development is to set very specific goals. Currently, most Ukrainian agricultural market participants have abstract concepts that cannot be measured.

Sufficient funding

During the war, most agricultural enterprises are on the verge of survival. Therefore, it is unlikely that they will be able to recover quickly after the war ends. This is why sufficient funding will be needed to quickly implement sustainable development principles.

Mine clearance of agricultural land

Unfortunately, about 2 million hectares of land in Ukraine are already mined. Accordingly, it is impossible to carry out economic activities on them. The demining process is expensive and time-consuming. In addition, the quality of the soil deteriorates and it takes longer to recover.

The need to improve the legal framework

We need to change the legislation completely, adjusting it to European conditions. This is about 40% of all regulations related to the Green Deal or food safety.

Gaining knowledge and experience

We need to transfer practical skills that will help us implement the principles of sustainable development faster. Otherwise, knowledge will remain theoretical baggage. Therefore, in this case, the help of European colleagues is needed.

Motivation tools

Ukrainian farmers need motivational tools in the form of programmes that will make companies interested in sustainable development.

Direct remarks of the survey participants on the assessment of the potential and existing challenges in implementing sustainable development approaches after the war

"When the war is over and Ukraine starts to move actively towards the European Union, we will have no choice but to move to the rails of sustainable development and implement the necessary approaches that will help us integrate into the European Union. And this will be a complete change of mindset, of our being."

"The entire Ukrainian agricultural sector will look completely different. We will introduce the challenges that will be faced, and we will have to deal with them. Otherwise, we will not receive any financing from banks. Those companies that apply for grants or subsidies from the European Union will not receive them unless they report on sustainable development."

"It is important for Ukraine to maintain the free trade zone, which is now only for 12 months. Before the war, Ukraine mainly exported to the poorest countries. If Ukraine continues free trade with the EU, a lot will change. The structure of crop cultivation will change, the methods of cultivation will change, because European certification is involved."

"The potential is very high. If our global partners and friends support us and join us in implementing sustainable development approaches, Ukraine is ready to implement them by its mentality and culture."

"The implementation of sustainable development principles will happen one way or another, because we are entering the European market, where all these principles have long been accepted and adhered to. And if companies do not implement these principles, do not start taking steps in this direction, they will lose competition with European companies, the cost of their capital will be more expensive, and their reputation in the market will be accordingly affected."

Lack of clear understanding of sustainable development by Ukrainian agricultural producers

The presence of a large number of farmers in the Ukrainian market who have a very rough idea of what sustainable development means requires, first of all, explanatory work.

"We need to work on communicating the essence of the Green Deal to Ukrainian agricultural producers."

"We need to make a 'fingerprint' explanation for businesses of what sustainable development is and why they need it. When we talk about sustainable development, 80% of people do not understand what it is, why it is needed and how it can be applied in terms of business."

"For a farmer to want to switch to the criteria of sustainable development, an information component is needed, businesses need to understand what sustainable development is and what the criteria are, to inform them that it is not as difficult as it seems. And we are not talking about high-minded matters, we are starting with the information policy, that we are not so far from that ideal."

"Communication is the first priority. We need to make it clear why it is necessary and show the economic benefits. If we are talking about precision farming, we need to convey that it is more favourable for reducing the pesticide load, and on the other hand, there is an economic benefit in terms of saving fertilisers and plant protection products. If we are talking about small and medium-sized farms, we need help from the state, loans to implement innovative changes."

"For Ukrainian farmers, sustainable development is somewhat abstract and incomprehensible, because there are a lot of words, but few specifics. Therefore, it is necessary to translate it into a clear, understandable line, and then the level of understanding will improve."

Clear sustainability goals

Specific goals will help to improve understanding of the principles of sustainable development.

"There are prospects, it will happen for sure, the main thing is that these are not abstract things, but those that are necessary for our market. This is a very pragmatic market. If

something is not clear, it will be implemented only on paper. Therefore, the task of the agrarian business, NGOs, associations, and those involved in this is to make it as clear and understandable as possible for the agrarian business. Not to start with reducing carbon dioxide emissions or increasing the quota of women, but to start with clear things."

"If we have clearly regulated regulations and a clear understanding of where we are heading, then farms will take an active part in this, improve and adjust to the general regulations."

"Measuring sustainability goals in some specific numerical values that the company can move towards and develop. This will accelerate implementation if everyone understands what the goal is and how it is measured. Because now in Ukrainian agricultural enterprises it is more abstract. No one understands that there are some sustainable goals, but what they are and how well we are achieving them."

Sufficient funding

"Without international funding, there will be no big steps in sustainable development in our country, especially after the war. In agriculture, both small farmers and large agricultural holdings are on the verge of survival. It's a question of who will be left after the war. Therefore, without additional funding, we cannot talk about improving the state of sustainable development."

"Capital will be very necessary. We hope that we will be more integrated into the European economic space. It is clear that we need to change standards to meet their requirements. Ukraine is not a very rich country, the costs of changing standards will be significant and it will not be easy. If there are any programmes that will help, cheap loans, subsidies, everything will be beneficial. The state of the economy after the war will be terrible. People are ready to work, we need capital, technology, transfer of certain equipment - all this will be extremely necessary."

"Businesses need money, funding, and investment. Sustainable development should be a must-have for everyone under the same conditions. It is through the involvement of investment programmes that companies can embark on the path of sustainable development and responsible business. Everyone who wants to develop will need

affordable and cheap money. And if they know that these tools will be available through fulfilling the conditions of sustainable development programmes, they will adhere to them. Anything else is unlikely to be that attractive to an ordinary manufacturer."

"I will say it simply: it is financing. It was very active even before the war started, and here we can only thank international institutions such as the EBRD and the European Investment Bank, which invested a lot in Ukraine. I wish they would return to the same level of work with Ukraine, and maybe even increase funding for their programmes. Ukraine has been very successful in implementing these programmes and has had great results."

Mine clearance of agricultural land

"After the war, the main issue is the demining of areas, including agricultural ones. There are many discussions on this issue: whether the land can be used or not, especially where there were phosphorus bombings. From this point of view, it is difficult to say to what extent these lands will comply with the Green Deal."

"When you have mined fields, you don't have time for biodiversity. You need to clear these fields of mines, which is very expensive. When the companies that have really suffered receive reparations to restore these losses, we can say that there will be a movement towards sustainable development. If companies are forced to start their own reconstruction from scratch after they have been completely destroyed, then their priorities will be different."

"It is an urgent issue to have a comprehensive programme to clear Ukrainian fields of mines, as this is a very big problem. And it will be our greatest corporate and social responsibility if we get help to make the working conditions in our fields safe for our people. When your tractor drivers can die while working in the fields, this is one of the most pressing sustainability issues today."

The need to improve the legal framework

"We need to change the legislation completely, adjusting it to European conditions. And this is about 40% of all regulations related to the Green Deal or food safety, and they need to be revised, communicated to producers, and then implemented. This is a huge

amount of work. Unfortunately, many people do not understand this. But now everyone is fighting for survival."

Gaining knowledge and experience

"It seems to me that the industry is ready, it has understood that it needs to move more to Europe, more to processing. The question is whether there will be enough capital, management resources, knowledge and training. The agricultural industry is very conservative. It takes years to change practices."

"We need practical training, the transfer of practical skills. They need to do it with their own hands a couple of times."

"If you go and see how the best companies in this industry operate, you gradually transfer this example to yourself. This applies to large enterprises. Small farmers don't go there, they don't look. But gradually they will follow the example of large enterprises. It is difficult for me to say how much time will be spent on this."

"Those consulting companies that will communicate and do the work for agricultural producers that relates to the implementation and reporting of sustainable technologies in the agricultural sector will be respected."

Motivation tools

"There should be tools of motivation and coercion, primarily on the part of financial institutions. Because if it comes from the state, it can contribute to even greater corruption (turning a blind eye, formal paperwork). If it is done where the money is going, it will be more effective and the industry will adapt."

"There should be programmes that make companies interested in sustainable development: why they do it and what they get out of it. The state simply needs to adopt programmes that have already been worked out."

"Businesses need to be interested, just as they were interested in Poland and Germany when it all started. It's all about business. If you comply with certain rules and standards for sustainable development, you get some additional bonuses. If you start producing biofuels, you don't pay excise duties on petroleum products. If you save CO₂, you get bonuses for something. If you do a crop rotation that meets the criteria for sustainable

development, you get a subsidy for each hectare of land. This should not be done by force, but voluntarily. To do this, companies need to be interested in doing this."

"The main problem is that companies do not follow the path of sustainable development because there is no programme and no incentive. There is no understanding of why they should do it."

Annex 1. Questionnaire for in-depth interviews with agricultural market experts on the topic "Challenges and potential for further sustainable development of medium and large agricultural enterprises in Ukraine"

1. Problems of sustainable development and risks of not using the principles of sustainable development in Ukrainian agriculture:
 - a) Issues: Water, soil and air pollution; climate change; forced labour, child labour, poor working conditions; animal welfare, biodiversity loss, deforestation, corruption, fraud, money laundering, etc.
 - b) Risks:
 - Market risks (failure to comply with responsible behaviour poses risks to the financial position of enterprises or impedes access to finance and sales markets)
 - Reputational risks (bad image due to irresponsible business practices)
 - Regulatory risks (violation of existing rules, lack of readiness to comply with broader regulatory changes)
 - Litigation risks (risks of legal sanctions due to non-compliance with laws)
 - Operational risks (potential losses from external physical events, including, for example, war and the blockade of Ukrainian ports, as well as extreme weather events, climate change, consumer preferences, animal diseases, the Covid-19 pandemic, etc.)
2. Awareness of the problems of sustainable development in Ukrainian agriculture:
 - a) To what extent does the agricultural sector in Ukraine adhere to the principles of sustainable development compared to other industries and other (developed) countries?
 - b) Are there any regulations in Ukraine that specifically address sustainability issues?
 - c) Are there any non-governmental organisations in Ukraine that promote sustainability / corporate social responsibility / responsible investment?
 - d) What is the level of awareness of sustainability / sustainability goals / sustainability aspects (environmental, social, economic, governance - ESG) among agricultural enterprises in Ukraine?
 - e) What type of agricultural enterprises are particularly involved in addressing sustainability issues? Agroholdings? Independent agricultural enterprises? Private farms?

3. What agricultural enterprises are doing in the field of sustainable development:
 - a) What were companies doing in the field of sustainable development before the war?
 - b) What are enterprises doing now? How has the war changed the activities/priorities of enterprises in the field of sustainable development?
 - c) What are the priorities for sustainable development of enterprises? What sustainability goals are in the focus of the enterprises? What is being done in relation to the environmental, social and economic aspects of sustainability?
 - d) Who do companies consider their priority stakeholders? Why?
 - e) What are the investment needs of enterprises in the field of sustainable development?

Investment needs related to sustainable development:

- Improvement of infrastructure (physical, social)
- Challenges in supplying agricultural products to markets, including logistics and product quality and safety
- Building capacity to increase crop yields and animal productivity;
- In particular, technological innovations and the creation of more sustainable production models (crop rotation, precision farming, regenerative farming, organic farming, soil and water conservation, integrated pest management, etc.)
- Improving the efficiency of resource use (water, energy, etc.)
- Improvement of management infrastructure (introduction of new approaches to human resources management, automation and digitalisation of management systems, integration of electronic systems for production and land management, etc.)
- Improving working conditions for our own employees
- Improved biodiversity and environmental conditions (including prevention of fertiliser residues in the soil and other environmental and natural resource pollution) in the areas of operations and in local communities
- Improving the conditions for keeping farm animals, etc.

4. Drivers of investment and sustainable development initiatives:

- a) What is the incentive for investing in the sustainable development of agricultural enterprises from the point of view of investors/lenders?
 - The need to meet the sustainability requirements of international financial institutions (EBRD, IFC)
 - Green finance / sustainable finance
 - The need to comply with the sustainability requirements of other borrowers (commercial banks)
 - The need to meet the requirements of stock markets/exchanges

- Regulatory requirements (e.g., EU Financial Disclosure Regulation (SFDR), EU Non-Financial Information Directive, EU Renewable Energy Directive, or any local Ukrainian requirements)
- Other drivers.

b) What are the barriers to investment in sustainable development?

Factors: lack of knowledge, distrust among businesses and investors, lack of resources, etc.

c) What sustainability investment strategies do investors have?

Strategies:

- Negative screening (excludes investment opportunities that may cause harm to society and/or the environment (e.g. through pollution, forced labour, conflict))
- Positive screening (includes agribusiness investment opportunities that may have a higher performance compared to other peers on targeted issues (e.g. climate change mitigation, human rights, water conservation))
- ESG investing combines (environmental, social and governance criteria (e.g. climate change mitigation, freedom of association, tax contributions) to inform investment decisions, largely to exclude cases that do not meet such criteria)
- Sustainability-themed investments (focused on supporting specific sustainability solutions, such as investments in renewable energy, sustainable agriculture or inclusive finance)
- Impact investing (aims to create a positive social, economic and environmental impact that is measured and disclosed)

d) Which strategies are prioritised and which are underrepresented and why?

e) What strategies for sustainable development investment might emerge in Ukraine in the future?

f) Agricultural enterprises also invest in sustainability on their own, i.e. without attracting external capital. What are the drivers of sustainability investment from the perspective of the enterprises themselves?

Possible motives for such investments:

- Instrumental (i.e., important for the smooth operation of enterprises), e.g., care for communities, rural populations, landowners, employees, investors/shareholders, etc.
- Ethical (i.e. important from a moral/human point of view), e.g. sense of responsibility of the owners/management, sense of belonging to the community where the enterprise operates, etc.

5. Sustainability certification and information disclosure

a) What voluntary sustainability standards are adopted in Ukrainian agriculture and how widespread are they in Ukraine? Which enterprises apply these standards?

Examples of voluntary sustainability standards: GLOBALGAP, Rainforest Alliance, Organic, Fairtrade, ProTerra Foundation, Roundtable for Sustainable Soy, Bonsucro, private standards of food industry companies (Nestle, Pepsico, Unilever, etc.)

- a) How do agricultural enterprises report and measure sustainability?
 - b) How common is the overstatement of sustainability performance by enterprises? Do companies often overstate their sustainability/corporate social responsibility performance to the public?
6. The process of preparing Ukrainian agricultural enterprises for European integration in terms of sustainable development
- a) How advanced is the process of preparing Ukraine's agricultural sector for the implementation of the requirements of the EU Green Deal/CAP in the framework of European integration?
 - b) To what extent did the war slow down/accelerate this process?
 - c) How ready are Ukrainian agricultural enterprises to meet the requirements of the EU Green Deal/ CAP at the moment?
 - d) What steps do you think the Ukrainian government should take to accelerate the process of adapting the requirements of the EU Green Deal/ CAP to Ukrainian agricultural enterprises?
7. What are the current (or, if it is difficult to estimate, then pre-war) results of Ukrainian agricultural enterprises' investments in sustainable development
- a) Examples: area of land under zero or minimal farming; production area of land monitored by drones/satellites or area under precision farming systems in general (can be estimated); number of enterprises implementing voluntary sustainability standards; amount of investments in rural infrastructure by enterprises; amount of charitable contributions to rural areas/communities; area of land under organic production; amount of investments in land reclamation systems by enterprises; amount of investments in welfare
 - b) How much has been invested in sustainable development in the agricultural sector of Ukraine over the past 5-10 years (in absolute and relative terms)?
8. Prospects for the implementation of sustainable development principles in agricultural enterprises after the end of the war:
- a) Assess the potential and existing challenges in implementing sustainable development approaches after the end of the war;
 - b) Assessment of risks and proposals for their management after the end of the war.

Note: some issues are not covered in the report, as the respondents do not have information on this subject. In particular, this applies to sustainable development strategies.