

## **SECTION 4. GENERAL AGRICULTURE**

### **4.1 The impact of environmental problems on the agricultural sector and agriculture in Ukraine and innovative ways to solve them**

The big problem for the environment and humanity is the irresponsible consumption of plastic and the lack of 100% of its processing. On of 2020, there are officially 5,455 landfills and landfills in Ukraine with a total area of over 8.5 thousand hectares. Such data are provided by the Ministry of Regional Development, Construction and Housing of Ukraine. These lands could have fields where agricultural products would be grown. Therefore, due to the lack of a sufficient number of waste processing plants, Ukraine is spending economically. In addition, landfills occupy large areas and interfere with the normal functioning of agricultural sector of Ukraine.

It is necessary to study foreign experience in solving such a problem and find innovative methods to solve it.

On January 1, 2016, 17 goals set out in the 2030 Agenda for Sustainable Development, which was adopted by world leaders in 2015 at the historic United Nations Summit, officially entered into force. One of the goals of sustainable development are 2 “Zero Hunger”, 12 “Responsible consumption and production”, 13 “Climate action”, 15 “Life on earth”, 17 “Partnership for the goal” [98].

Environmental problems are one of the main ones today. They have also found reflection in sustainable development, in table. 1.

Table 1

**Reflecting environmental issues for sustainable development**

| № | Goal                                        | Issues                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|---|---------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | 2                                           | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 1 | 2 “Zero Hunger”                             | <ul style="list-style-type: none"> <li>- by 2030, ensure sustainable food production systems and agricultural practices that increase resilience and productivity and increase production, conserve ecosystems, enhance resilience to climate change, extreme weather events, droughts, floods and other disasters, and gradually improve the quality of land and soil;</li> <li>- Increase investment, including through increased international cooperation, in rural infrastructure, agricultural research and advocacy, technology development and establishment of plant and animal genetic banks to strengthen the capacity of developing countries, especially the least developed countries, in the field of agricultural production.</li> </ul>                                                                                                                                                          |
| 2 | 12 "Responsible consumption and production" | <ul style="list-style-type: none"> <li>- by 2030, achieve sustainable development and efficient use of natural resources;</li> <li>- achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international principles, and significantly reduce their release to air, water and soil in order to minimize their negative impact on human health and the environment;</li> <li>- by 2030, substantially reduce waste by taking action to prevent, reduce, recycle and reuse waste;</li> <li>- assist developing countries in building their scientific and technological capacity to move towards more sustainable patterns of consumption and production</li> </ul>                                                                                                                                                                       |
| 3 | 13 “Climate action”                         | <ul style="list-style-type: none"> <li>- integrate climate change responses into policies, strategies and planning at the national level;</li> <li>- fulfill the commitment made by developed countries that are parties to the United Nations Framework Convention on Climate Change to ensure full operation of the Green Climate Fund by capitalizing it as soon as possible</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 4 | 15 “Life on earth”                          | <ul style="list-style-type: none"> <li>- ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, including forests, wetlands, mountains and drylands, in accordance with obligations arising from international agreements;</li> <li>- take immediate meaningful action to curb the degradation of natural habitats, halt the loss of biodiversity, and ensure the conservation and prevention of the extinction of endangered species;</li> <li>- ensure that the value of ecosystems and biodiversity is taken into account in national and local planning and development processes, and in the development of strategies and plans for poverty reduction;</li> <li>- mobilize and significantly increase financial resources from all sources for the conservation and sustainable use of biological diversity and ecosystems</li> </ul> |

|   |                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|---|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5 | 17 “Partnership for the goal” | <ul style="list-style-type: none"> <li>- strengthen support for capacity building in developing countries, including least developed countries and small island developing States, to significantly increase the availability of high quality, relevant and reliable data;</li> <li>- build on current initiatives, develop other measures of progress towards sustainable development, in addition to gross domestic product, and help build statistical capacity in developing countries;</li> <li>- promote the development, transfer, dissemination and uptake of environmentally sound technologies so that they are available to developing countries on mutually agreed favorable terms, including concessional and preferential terms</li> </ul> |
|---|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

\* summarized by the authors according to the goals of sustainable development [99]

Given the above, developed by the Government of Ukraine, on January 1, 2016 entered the current national system of CSW, which consists of 17 goals of sustainable development of the country with the peculiarities of national development. It is necessary to summarize the main objectives and indicators related to these goals in the research and identify key indicators that should be achieved by 2030.

Thus, the strategic goal is to create organizational and economic conditions for the introduction of innovative methods of environmental production, especially in the agricultural sector, the introduction of new and effective mechanisms of technology transfer, increasing the share of innovative enterprises in the agricultural sector [100].

One of the important indicators that determines the impact of environmental pollution on world food security is the Global Food Security Index (GFSI). It includes 4 indicators: Overall Score, Affordability, Availability, National resources and resilience.

Natural Resources and Sustainability is the fourth component of the Global Food Security Index, which aims to assess a country's impact on climate, as well as its resilience to natural resource risks and how a country adapts to those risks, all impacts on food insecurity. One of the indicators of group 4 is Land degradation, that characterizes proportion of land that is degraded over total land area (%). The source of this information is the United Nations. Table 2 shows the 10 countries with the highest rankings of the Global Food Security Index in 2021, and also Poland and Ukraine.

Table 2

**Countries with the largest Global Food Security Index**

| Country        | Position | Overall food security environment | Position | 4. Natural resources and resilience | 4.3. Land | 4.3.1. Land degradation |
|----------------|----------|-----------------------------------|----------|-------------------------------------|-----------|-------------------------|
| Ireland        | 1        | 84,0                              | 3        | 74,1                                | 75,7      | 82,5                    |
| Austria        | 2        | 81,3                              | 12       | 65,7                                | 87,9      | 92,5                    |
| United Kingdom | 3        | 81,0                              | 6        | 69,0                                | 71,2      | 82,5                    |
| Finland        | 4        | 80,9                              | 2        | 75,1                                | 91,1      | 100                     |
| Switzerland    | 5        | 80,4                              | 13       | 65,1                                | 83,6      | 84,7                    |
| Netherlands    | 6        | 79,9                              | 18       | 61,2                                | 80,1      | 83,3                    |
| Canada         | 7        | 79,8                              | 35       | 54,4                                | 79,2      | 82                      |
| Japan          | 8        | 79,3                              | 16       | 61,9                                | 75,4      | 74,2                    |
| France         | 9        | 79,1                              | 8        | 67,5                                | 78,5      | 81,7                    |
| United States  | 10       | 79,1                              | 17       | 61,3                                | 55,6      | 72,2                    |
| ....           |          |                                   |          |                                     |           |                         |
| Poland         | 22       | 74,9                              | 14       | 65                                  | 85,5      | 93,3                    |
| Ukraine        | 58       | 62                                | 56       | 49,3                                | 67,4      | 60                      |

\* Scores are normalized 0-100, where 100=most favorable food security environment

\*\* <https://impact.economist.com/sustainability/project/food-security-index/> [101]

Ukraine's integration into the European Community is a complex and long-term process that began long before the signing of the Association Agreement between Ukraine, on the one hand, and the European Union and its Member States, on the other (hereinafter). The signing of the Agreement created new opportunities for the adoption of new standards in various spheres of public life, including in the field of environmental protection.

Reforms of the legal framework in one of the priority areas in the European Community (environmental protection) were carried out with the support of European institutions under the Sectoral Policy Support Program. This Program was focused on specific goals based on the National Environmental Strategy of Ukraine. Thus, Annex XXX to the Agreement stipulates that Ukraine must implement a number of documents of the European Union, thus bringing national legislation closer to the legislation of the European Union.

There are three types of documents in the European Union: Directives, Regulations and Decisions. Directives are framework documents that set targets for EU Member States and are binding. Each Member State has the right to decide

independently on the mechanisms for achieving its objectives through national legislation. Regulations are usually documents of direct effect for each Member State.

The implementation of EU legislation in Ukraine in the field of environment took place within eight sectors, which is regulated by 29 rules of law - EU Directives and Regulations in this area. Waste and resource management is important among the selected sectors [102].

Unlike Ukraine's environmental legislation, which has been declarative in many respects, EU law defines the quantitative and qualitative results that each country must achieve over a period of time.

After signing the Agreement, Ukraine continued the process of adapting domestic legislation in the field of waste management to European standards.

The law in the field of waste management (and their separate streams) in the EU is represented by a number of directives and regulations:

- Directive 2008/98 / EC on the waste and repeal of certain directives (framework),
- Regulation 1013/2006 - on waste transportation,
- Regulation 2150/2002 - on waste statistics,
- Directive 2004/35 / EC on liability for damage to the environment,
- Directive 2008/35 / EC - on the protection of the environment through criminal liability,
- EU Regulation 1272/2008 on classification, packaging and labeling of dangerous substances and mixtures.

Almost every directive has targets for what needs to be done in each country.

If we summarize the general provisions and requirements of the above standards, we can conclude that most of them are aimed at increasing the percentage of waste recycling and reducing the amount of waste entering landfills or disposal. Also, each of the directives aims to make waste management safer for the environment and people.

Let's focus on some of them. Directive 2008/98 / EC establishes a list of wastes, a classification of waste management operations, requirements for the management of hazardous wastes, a ban on the mixing of hazardous wastes, the labeling of hazardous

wastes, and the availability of hazardous waste territory of EU countries. Article 11 of the Directive requires separate collection of glass, paper and cardboard, metal, polymers, textiles by 2025, as well as preparation for reuse and recycling. Article 22 establishes the need for separate collection of biological waste and ensuring its further treatment and recovery. This Directive sets a number of targets. Thus, by 2025, the Community countries must prepare for reuse and recycling 55-60% of waste in general, and by 2030 - 60-65%. The Directive also sets out the requirements for permitting procedures for organizations and enterprises that collect and transport waste on a professional basis.

Directive 1999/31 / EC lays down requirements for waste to be sent to landfills only after treatment in order to reduce its volume and risk to the environment. That is, it is impossible to take a container with mixed waste to the landfill. The directive also determines the procedure for payment for waste disposal, which is taken into account during the construction, operation, closure of the landfill and its care for the next 30 years after its closure.

Directive 2006/21 / EU approved Decision 2009/337 / EC defining the criteria for the classification of objects in accordance with the Annex to the Directive.

Another Directive 2010/75 / EC on industrial emissions applies to industrial activities in the event of pollution and does not apply to research and development centers.

Chapter IV of this Directive lays down special requirements for waste incineration plants and co-incineration plants. These include emission monitoring, emission limit values, operating conditions (carbon content of incineration residues, incineration temperature, etc.), energy use, delivery and acceptance of waste and reporting.

In addition, the EU has adopted a number of documents that provide a system of extended producer responsibility:

- Directive 2006/66 / EC - on batteries and accumulators and waste batteries and accumulators containing dangerous substances.
- Directive 2012/19 / EU - on waste electrical and electronic equipment.

- Directive 94/62 / EC on packaging and packaging waste.

Today in Ukraine the requirements and responsibilities for waste management are defined by the Law of Ukraine "On Waste" № 187/98 of March 5, 1998, Resolutions of the Cabinet of Ministers of Ukraine, regulations of ministries and other executive bodies, regulations. In order to approximate national legislation to European legislation, Ukraine is obliged to implement Directives № 2008/98 / EC, № 2006/21 / EU and № 1999/31 / EU. In addition, the issue of waste management is also related to the implementation of Directive 2010/75 / EU on Industrial Emissions (Integrated Pollution Prevention and Control).

The implementation of these directives involves significant changes and additions in the legal field. First of all, Ukraine is facing the need to move to a new conceptual framework, within which the priority goals of waste management will ensure the movement towards a "circular" economy with cascading use of resources and minimization of residual products. The period of implementation of the three above-mentioned directives under their various provisions is up to 5-6 years. Unfortunately, given the objective reasons that exist in Ukraine, including the current martial law, these deadlines cannot be fully met. However, the main principles of waste management reform have been established [102].

#### 1. Compliance with the principles of the closed-loop economy

Closed-loop economy, or Circular economy, is a model of economic development based on the recovery and rational consumption of resources, an alternative to the traditional, linear economy. Uses economic approaches to minimize the negative impact on the environment, waste-free production and achieve sustainable development goals.

#### 2. Waste management hierarchy

The five-step waste management hierarchy is based on the priority of waste prevention, and if prevention fails, re-use efforts are made. If this is not possible - recycling is carried out (materials from waste are processed into products, materials or substances). Recycling includes the recycling of organic material, but does not include energy recovery or recycling into materials to be used as fuel or refillable materials.

When recycling is not possible, other types of waste disposal are used, including energy recovery or recycling operations to be used as fuel or refill materials. If it is not possible to perform preliminary operations, waste is removed - buried in specially equipped places and destroyed (disposed of) in facilities that do not meet environmental standards.

### 3. Integrated waste management information system

For effective waste management at both national and regional levels, an information system should be developed with easy access to data on licenses, permits, landfills and landfills, up-to-date information on pollutants and recycling facilities.

### 4. Systematic and planned

The reform is being implemented at the state, regional and local levels. Based on the National Waste Management Plan, Regional Waste Management Plans are developed using common methodological approaches.

### 5. Extended producer responsibility (RVV)

It is a financial and organizational mechanism aimed at supporting the development and production of goods that fully take into account and facilitate the efficient use of resources throughout their life cycle, including their recovery, reuse, disposal without compromising the free circulation of goods in the domestic market. The main goal of RWB is to increase the amount and degree of product recovery and minimize the impact of waste on the environment.

The RWB policy first began to be applied in a number of European countries in the early 1990s, especially with regard to packaging waste, and has subsequently spread to the EU and beyond. Since then, the RWB system has significantly increased the rate of waste recycling and helped save government spending on waste management.

### 6. Integration into the EU waste market and the European waste management system

The reform not only complies with European legislation, but also takes into account Ukrainian realities and market specifics. At the same time, such fundamental things as requirements for participants in the waste management system, waste

classification - must fully comply with EU standards. This is to make it easier for Ukrainian institutions and businesses to integrate into the EU system and speak the same legal language with their partners.

To date, Ukraine has adopted and adopted the National Strategy for Waste Management in Ukraine until 2030, which identifies the main directions of regulation at the state level in the field of waste management in the coming decades, taking into account approaches based on the above European standards. The Law of Ukraine “On Waste” has been amended and the draft Law “On Waste Management” № 2207-1d is being prepared for the second reading, which will establish new transparent rules and allow building a modern waste management infrastructure [103].

The bill is based on three EU directives - on waste, waste disposal, industrial emissions and provides for:

- introduction of a hierarchy of waste management;
- introduction of the "polluter pays" principle;
- introduction of an extended producer responsibility system, which requires packaging manufacturers to be responsible for the full life cycle of the packaging created, batteries, accumulators, electrical and electronic equipment, etc .;
- creating opportunities to attract investment in the construction of recycling plants;
- introduction of strict European environmental standards for waste incineration and disposal operations to prevent damage to human health and the environment;
- legal basis for short-term and long-term waste management planning;
- introduction of an electronic waste management information system to ensure transparency in the industry and avoid corruption risks, which will consist of open registers, modules for the provision of administrative services (issuance of all documents online), reporting and analysis of static information.

In addition, the bill proposes to solve such problems as uncontrolled disposal of waste in landfills that do not meet environmental standards; fictitious recycling of waste, when in fact they are recycled only on the basis of documents; carrying out various operations with waste without permits.