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«Improvement of all branches of science:  
digitalization, challenges, interdisciplinary  
integration»

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# **IMPROVEMENT OF ALL BRANCHES OF SCIENCE: DIGITALIZATION, CHALLENGES, INTERDISCIPLINARY INTEGRATION**

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## **ENVIRONMENTAL ASPECTS OF THE SOCIAL RESPONSIBILITY OF NON-PRODUCTION ORGANISATIONS**

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The relevance of social responsibility in the environmental sphere stems from social processes that, driven by scientific and technological progress, globalisation, and the scale of human activity, combined with short-sighted resource planning, have aggravated environmental problems. The deterioration of the environment and the rise in diseases associated with this factor have led to a shift in consumer attention from product price characteristics to compliance with environmental criteria. Estimates of the amount of natural and energy resources proved to be overly optimistic. The risks of energy and resource crises are growing. The features of the current situation in environmental protection are the transition from combating the consequences to eliminating the root causes of environmental problems and the introduction of new forms of social responsibility - in particular, digital responsibility, which involves the use of digital technologies to monitor the environmental state and minimise the negative impact on the environment.

The concept of sustainable development, which has become mainstream in the field of social responsibility, pays significant attention to the environmental component and emphasises its importance alongside economic and social development. At the same time, the emphasis is on environmental protection and rational use of natural resources. The areas of environmental protection in the concept of sustainable development include:

- pollution prevention;
- sustainable use of resources;
- mitigation of the consequences of climate change;
- protection of biodiversity.

Each area involves certain types of activity, the effective implementation of which should be defined as socially responsible behaviour.

Given the importance and existential significance of environmental protection, any enterprise must incorporate environmental considerations into its social responsibility strategy. It is clear that for large industrial enterprises, addressing environmental issues is crucial given the potential consequences. However, how important are these issues for a small organisation engaged in intellectual work? Should it take care of environmental issues, given its negligible impact on the environment? Shouldn't it focus on other aspects of sustainable development, rather than incurring expenses to solve environmental problems, thereby reducing the social efficiency of such a company? Compared to large enterprises, the environmental impact of such companies

is not insignificant. However, statistics show that, on average, a person throws out between 250 and 400 kg of garbage per year, and given that the world's population is about 8 billion, one can imagine the scale of this problem. Therefore, given that the number of small companies in the service or intellectual work sector is also significant, their impact on the environment should not be neglected.

The environmental aspect of activities in such companies is often considered a component of the system for ensuring overall efficiency. Increasing the environmental efficiency of office work is possible by implementing certain environmental concepts into everyday practice, which offer their own understanding and philosophy of environmental protection. The most famous and widespread concepts are:

3R concept;

“Green office”;

“Sustainable consumption”;

5R concept;

10R concept.

The 3R concept (also known as the “Waste Hierarchy”) is a framework for ecological consumption that promotes rational wastemanagement by reducing the amount of garbage through three consecutive steps: minimising purchases, reusing items, and recycling materials. The essence of the concept is the systematic use of three principles in everyday life:

reduction – reduce the consumption of water, energy, and other resources, as well as refusing to buy unnecessary or disposable items;

refinement – reuse, increase the life of the product by restoring its properties by repairing, repurposing, upgrading, or transferring it to others);

replacement – recycle and purchase goods and services that minimise the harmful impact on the environment, sort garbage and waste for further recycling, promote more efficient use of transport for personal and business purposes, etc. [2].

Although the idea of rational waste management has existed in Europe since the 1970s, it gained international recognition thanks to the Japanese government, which presented it as an environmental initiative at the G8 summit in Sea Island in 2004 [2]. The concept has subsequently been improved several times and has led to the emergence of other, deeper and more extensive environmental concepts.

“Green office” is a concept for organising office activities that focuses on optimising resource consumption, conserving the planet's resources, and minimising harmful environmental impacts.

The “Green office” concept was developed and implemented by the World Wide Fund for Nature (WWF) in Finland. The idea originated in 1996, and WWF initiated large-scale dissemination of the concept as an environmental management system for offices in 2002, after which it quickly gained popularity not only in Finland but also around the world.

The “Green office” concept is a project for restructuring an organisation's work, involving targeted changes in working conditions, work organisation, attitudes to resources, and production behaviour. It is based on the 3R concept, whose principles are used to improve the main types and areas of activity in the office.

Initially, the concept focused on four areas of activity: waste management, energy consumption, transport policy and paper use. However, the understanding of environmental opportunities has expanded further, and at present, the main areas in the concept are:

- 1) management;
- 2) communications and interaction;
- 3) energy and water supply;
- 4) procurement;
- 5) recycling, sorting and cleaning;
- 6) travel;
- 7) food [6].

The advantages that a “Green office” provides to companies:

a significant reduction in office maintenance costs;

a real contribution to reducing the consumption of natural resources, reducing greenhouse gas emissions and toxic substances into the environment;

an additional component of the company's positive image among customers and partners;

The formation of environmental awareness.

The goals of a “Green office”:

reducing the consumption of electricity, water, heat, paper and plastic;

reducing the volume of waste and transferring it for recycling and safe disposal;

using products made from recycled materials or that do not contain harmful chemical compounds;

creating favourable conditions for employees to work.

In Ukraine, based on global experience with the Green Office concept and its adaptation to local conditions, the SOU OEM standard 08.002.36.067:2012 “Administrative services (offices). Environmental criteria” (the Green Office standard) has been developed. The standard allows for the assessment and certification of office organisations. The assessment of compliance with the requirements of the standard is carried out by the certification body of the All-Ukrainian public organisation “Living Planet” as an independent third party.

The standard defines the main and additional requirements. The condition for certification is that the organisation fulfils all the main requirements and at least one additional requirement in each category. For each area, the company must provide documents specified in the standard that confirm the results achieved [6].

Typical tasks for implementing the concept include assessing the current state of the organisation’s activities and conditions, followed by the determination of potential reserves for each area. Even if the organisation is not focused on obtaining a certificate, implementing changes will increase its level of social responsibility.

For each area, there are typical reserves for most organisations: saving electricity, heat, water, and resources, and reducing the negative impact on the environment.

Saving electricity:

installing energy-saving lighting devices;

installing automatic lighting control systems;

- using energy-saving monitor modes;
- purchasing energy-efficient electrical equipment.

According to the Directives of the European Union Commission on Energy and Transport (92/75/CEE, 94/2/CE, 95/12/CE, 96/89/CE, 2003/66/CE and others), energy efficiency classes are determined for household electrical appliances, which are marked with the appropriate marking.

Different types of devices have their own energy consumption levels. Class G devices consume the most energy. Class D devices have standard energy consumption values. Class A+++ devices have the best energy-efficiency indicators.

Energy efficiency class is the level of energy efficiency of equipment.

Energy Star is an international standard for energy efficiency of consumer products. Developed in the USA in 1992. The Energy Star label guarantees high energy efficiency without compromising the device's functionality. Energy-saving products are marked with a special logo. Devices with this label consume 20-30% less energy compared to others with the same functionality.

Heat saving:

- use of heat supply control systems;
- installation of heat meters.

Water saving:

- installation of water consumption meters, which leads to greater responsibility in their use;

- changing the behaviour and habits of personnel;
- use of water-saving technologies.

Resource saving:

- selective garbage collection (separately collected waste is not garbage, but secondary raw materials);

- use of paper made from recycled paper or FSC-certified wood;
- printing on the back of the paper and double-sided printing.

Reducing the negative environmental impact is primarily achieved through selective waste collection. It is facilitated by considering the type of material on the product labelling. Recycling codes have evolved significantly in recent years:

1988 - The US Plastics Industry Society developed recycling codes for different types of plastic.

1994 - European Union Directive 94/62/EC on recycling codes for different types of materials;

1997 - European Commission Decision 97/129/EC;

2010 - ASTM D7611/D7611M, Standard Practice for Coding Plastic Manufactured Articles for Resin Identification.

Recycling marking is indicated on the packaging with a special triangle symbol of three consecutive arrows. The percentage inside the triangle indicates the content of recycled materials in the product.

Materials differ in their ability to be further processed. So not all types of paper are well recycled. Paper combinations are theoretically recyclable, but in practice, it is very

difficult to find collection points. In this case, it is worth refusing such products at the point of purchase.

When buying paper, you should also pay attention to its origin and give preference to paper made from waste paper or FSC-certified wood.

Maintaining electronic document management and abandoning printed publications that have online versions are other ways to reduce waste.

A significant threat to the environment is plastic waste. Not all types of plastic are safe to use and are easily recyclable. Biodegradable plastic, which has recently been widely promoted as an ecological alternative to conventional plastic, actually decomposes only under certain conditions. In their absence, it becomes ordinary garbage and is not recycled. Therefore, in the absence of collection points for such plastic, it is also advisable to refuse its use.

Separate garbage collection becomes effective if certain rules are followed.

Rules for garbage collection:

determine the place and container;

separate the excess;

compress if it is compressible;

collect in volumes that are easy to transport to collection points.

Purchase of office supplies should be carried out in volumes that are optimal for performing the work and that comply with the above requirements.

The implementation of the Green Office concept in the organisation's activities also requires information and explanatory work among employees, as well as their involvement in saving office resources. Visual aids that remind of optimal behaviour can play an important role. Stickers on switches, inscriptions on office equipment, posters, etc., can be used for this.

Another concept for improving environmental behaviour is "Sustainable Consumption".

Sustainable consumption is a concept for organising consumer behaviour that involves a person making decisions that take into account not only their own needs, but also the social, environmental and ethical aspects of purchases and consumption. The concept was created in 2005 by James P. Womack and Daniel T. Jones to increase the efficiency of large corporations [4]. However, it has also proven attractive to other companies.

Lean consumption is manifested in attitudes towards purchases and the use of resources and involves purchasing only what is necessary, saving resources, reducing waste, and taking care of property.

The rational attitude towards resources in the concept of lean consumption is transformed from a principle of behaviour into a lifestyle that manifests itself not only in the workplace but also outside it.

Principles of lean consumption:

1. Proper storage.
2. "First in, first out".
3. Optimisation of purchases.
4. Optimisation of stocks.

5. No waste.

6. Ethical and ecological choice [4].

The 5R concept, based on the Zero Waste philosophy, is a further development of the 3R concept. This is the concept of the full life cycle of resources, which involves the reuse of all resources and minimising waste.

Zero Waste is a philosophy of resource conservation that involves minimising waste production, reusing resources, and reducing consumption costs. The goal of the concept's proponents is to prevent pollution of the planet, including landfilling, burning, and dumping waste into water bodies [3].

A zero-waster is someone who adheres to a zero-waste lifestyle. The most successful of them collect waste that cannot be recycled or composted in a small jar.

The 5R concept involves the practical implementation of five principles in their activities and everyday life:

Refuse – do not buy unnecessary things; buy things without packaging; do not buy plastic bottles, bags, disposable tableware, biodegradable items, etc.

Reduce – the following are subject to reduction: food, cosmetics, accessories, clothing, alcohol, and smoking.

Reuse – to use again, which includes such typical methods as: give, exchange, rent, repair, sell, upgrade.

Recycle – to create new products from waste or those products that have already lost their useful properties. The basis for recycling is the separate collection of waste at home. However, batteries, energy-saving lamps, and electronics must be taken to special hazardous waste collection points [3]. A typical recycling method is upcycling.

Upcycling – a method of producing clothing or objects from previously manufactured items that are no longer used.

Rot – this principle involves collecting organic waste and turning it into compost.

Unlike the 3R concept, the focus of the 5R concept is not on reducing waste, but on preventing it.

The 10R concept, proposed by Professor of Sustainable Entrepreneurship and former Minister of the Environment of the Netherlands, Jacqueline Kramer, for the circular economy, is another attempt to creatively develop and rethink the 3R model [1].

Principles of the 10R concept:

Refuse – preventing unnecessary use of raw materials.

Reduce – reducing the use of raw materials.

Renew – recycling of a product, taking into account its life cycle.

Re-use – reuse of a used product.

Repair – maintenance and repair of a product.

Refurbish – modernisation and revival of a product, restoration of its properties or improvement and increase of functionality.

Remanufacture – production of a new product from a used one.

Re-purpose – reuse of a product, but with a different function.

Recycle – organisation of material flows for recovery with the maximum possible value.

Recover – incineration of waste with energy recovery [1].

The 10R concept is the most modern attempt to ensure businesses' social responsibility in environmental matters.

Thus, the environmental component of the social responsibility of non-manufacturing companies and institutions can be ensured by using in their activities existing concepts of minimizing harmful impact on the environment and saving resources. The choice of a specific one and the achievement of the highest efficiency are determined by the organisation of activities within the company and the external opportunities available to it for waste disposal.

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