European Journal of Research Development and Sustainability (EJRDS)
Available Online at: https://www.scholarzest.com
Vol. 2 No. 7, July 2021,
ISSN: 2660-5570

TOPICAL ISSUES OF THE INTRODUCTION OF ENVIRONMENTALLY FRIENDLY TECHNOLOGIES

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Article history:

Received: May 26th 2021
Accepted: June 7th 2021
Published: July 14th 2021

Abstract:

This article is devoted to the actual problem of the application of environmentally friendly technologies; where the definitions of the basic concepts and terms of resource saving and resource saving, technologies are given. The economic and natural types of resources are described in detail; the main directions of resource conservation are shown. Moreover, some aspects of providing energy resources, the use of resource-saving technologies in agriculture.

Keywords: Environmentally friendly technologies, resource conservation, renewable and non-renewable (fuel and energy) resources, natural resources, capital resources, labor resources, energy products, energy raw materials, synergistic effect, climate change, ecosystems.

The issues of environmental safety in recent decades have attracted many academic researchers, practitioners in all forms of economic management. And today the issues of application of environmentally friendly technologies for many investors have become a peculiar, relevant and necessary direction of capital investment.

Modern conditions of economical development of countries demand active development of innovation sphere, as scientific and technical progress is a continuous process of discovery of new knowledge and its application in social production, which allows connecting and combining available resources in a new way in the interests of increasing output of high quality end products at the lowest costs.

With the development of modern production with its scale and growth rate, the problems of development and implementation of low- and zero-waste technologies are becoming more and more urgent. Their fastest solution in a number of countries is considered as a strategic direction of rational use of natural resources and environmental protection.

In many firms, especially in large factories (for example, in the production of reinforced concrete), there are huge resource costs, in connection with which they need to increase profitability and reduce costs, saving fuel, energy, necessary materials. At such enterprises, one of the tasks should be the introduction of resource-saving technologies.

The concept of non-waste technology, according to the Declaration of the UN Economic Commission for Europe (1979) means the practical application of knowledge, methods and means in order to ensure the most rational use of natural resources and protect the environment within human needs [1].

The principles for the establishment of low-waste or zero-waste production should be the following:

- the principle of consistency;
- complexity of the use of resources;
- cyclicality of material flows.

There are some trends and developments in wasteless and low-waste technology in certain industries.

1. Energy. In the energy sector it is necessary to use new methods of fuel combustion, such as combustion in a fluidized bed, which helps to reduce the content of pollutants in exhaust gases, the introduction of developments to clean up sulfur oxides and nitrogen oxides of gas emissions;

2. The chemical and oil refining industry. In the chemical and oil refining industry, on a larger scale, it is necessary to use in technological processes: oxidation and reduction using oxygen, nitrogen and air; electrochemical methods, membrane technology of separation of gas and liquid mixtures; biotechnology, including biogas production from residual organic products, as well as methods of radiation, ultraviolet, electric pulse and plasma intensification of chemical reactions.

There are some recommendations for the organization of resource-saving technologies, namely:

- ✓ all production processes should be carried out with a minimum number of technological stages, since each of them generates waste and loses raw materials. technological processes should be continuous, which will allow the most efficient use of raw materials;
- ✓ the unit capacity of technological equipment should be optimal, which corresponds to the maximum coefficient of efficiency and minimum losses;
- ✓ when developing new technological equipment, it is necessary to provide for the widespread use of automatic systems based on computer technology that ensure the optimal conduct of technological processes [2].

The current ecological state of the environment can be regarded with mistrust and apprehension. Intensive pollution of the natural environment continues. The decline in production has not led to a similar decrease in pollution, because in the economic crisis conditions enterprises began to save on environmental expenditures as well.

However, not everybody is ready to accept innovations, as modern society is not fully aware of catastrophe, which is inevitable if proper measures are not taken, which in its turn aggravates environmental situation. Speaking of environmentally friendly technologies, it should be noted, that clean technologies (Cleantech) or environmentally friendly technologies (Greentech) are products or services that improve performance, productivity or efficiency while reducing production costs, energy consumption, waste treatment or environmental pollution.

The meaning of the term "resource conservation" is formed by two separate words, "resources" and "conservation. Resources have the potential to participate in production and consumption, but are limited at any given time. That is why the second component of the term "resource-saving" is objectively determined by the emergence of the second part of the term, which concerns the issues of saving, that is, the economical use of all types of resources.

Resource saving is an organizational, economic, technical, scientific, practical and informational activity, including methods, processes, a set of organizational and technical measures and activities that accompany all stages of the life cycle of objects and aimed at the rational use and economical use of resources.

Resources are used and potential sources of satisfaction of the needs of society. It is possible to subdivide all resources into (Fig.1):

- material and energy (primary and secondary);
- capital;
- labor;
- information;
- financial;

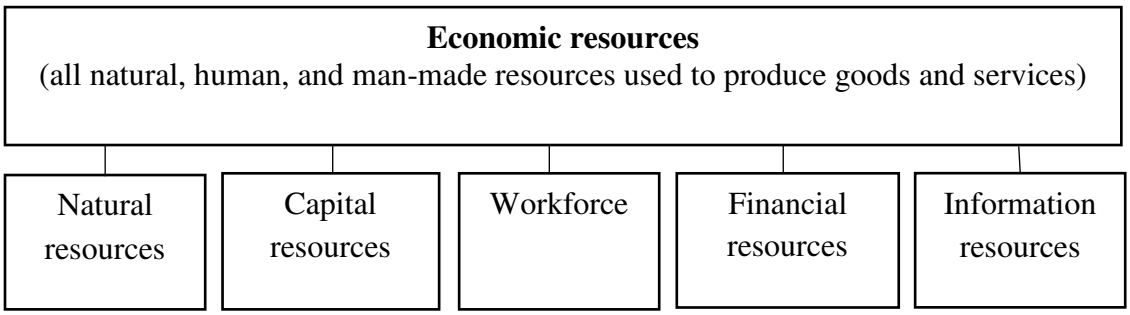

Fig.1. Types of economic resources

Resources include employees, infrastructure, production environment, information, suppliers and partners, natural and financial resources; tangible resources, such as improved production and support facilities; intangible resources, such as intellectual property; resources and mechanisms that contribute to innovative continuous improvement. Based on the topic of the study, let us distinguish natural resources, which, in turn, are divided into exhaustible and inexhaustible (Fig. 2).

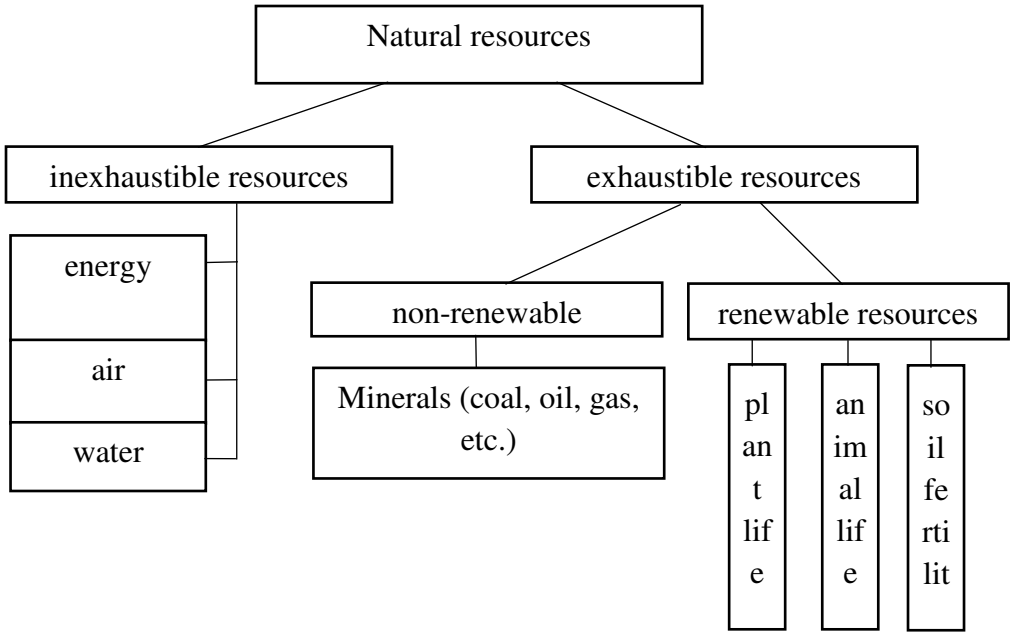

Figure 2. Types of natural resources

Resources can be renewable and non-renewable (fuel and energy).

Renewable resources include a part of natural resources within the cycle of substances in the biosphere, capable of self-renewal within a period commensurate with the terms of human economic activity (vegetation, fauna, atmospheric oxygen, etc.). A striking example of renewable resources in light industry are plant raw materials - cotton, flax, raw materials of animal origin - wool, silk, etc.

Fuel and energy resources are a set of natural and produced energy carriers, the stored energy of which is available for use in economic activity at the existing level of technology and technology development.

Resource use is the purposeful use and expenditure of resources of various types at the stages of the life cycle of goods in the interests of society development.

Rational use of resources is the achievement of normalized efficiency of resource use in the economy at the existing level of technology and technology development with a simultaneous reduction of the negative impact on the environment.

The economical use of resources is the achievement of the maximum efficiency of the use of resources, including through their reasonable replacement with the receipt of economic benefits and increased safety for people and the environment.

Resource-saving activity of the enterprise goes far beyond the economy of material and raw materials, and connects the system of concepts: cost management, inventory management, development and production technology and environmental management. Resource saving on a national economy scale begins with design, when already at the stage of projects of extractive, processing and final enterprises the principles of resource saving are put in all technological operations at all stages of movement of a product to the consumer, and getting to the closing production - from design, technological and operational features of their use [3].

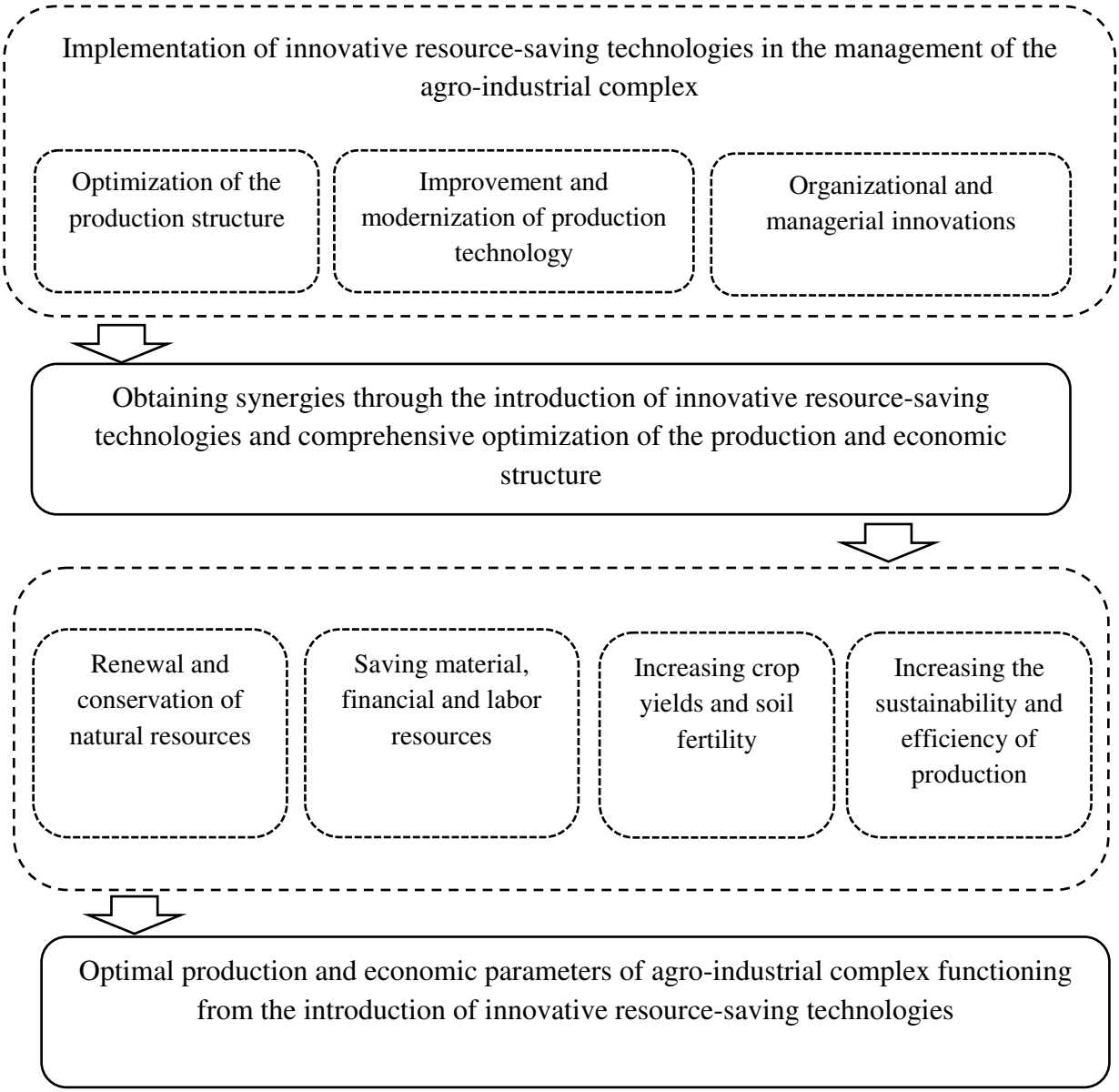

Fig.2. The main directions of resource saving

As can be seen from Fig.3. three fundamental processes, such as, optimization of production structure, improvement and modernization of production technology, organizational and managerial innovations determine the synergistic effect due to the introduction of innovative resource-saving technologies, which in turn means an increase in efficiency as a result of integration, merging of individual parts into a single system due to the so-called system effect (emergence).

The gradual transition to complexes of low-waste and resource-saving production, "production bundling" makes it possible to significantly reduce the load on the environment, especially at the regional level.

Modern technologies, replacing obsolete and nature-intensive ones, make it possible to significantly reduce the number of fields developed and preserve the reserves of exhaustible, non-renewable natural resources for future generations. The enormous potential of low-waste technologies is illustrated by the following figures. Today, due to imperfect extraction technologies, up to 70% of oil, 30% of coal, 20% of iron ore, etc. remain in the ground.

For example, speaking of the application of resource-saving technologies in agriculture, it should be noted that machine technology affects the soil, plants or animals. Therefore, questions about the wise use of resources and energy allocation are actively discussed.

To solve this problem, equipment schedules are made to make the machinery as useful as possible. In addition, in order to save resources, incandescent bulbs are being replaced by fluorescent products that are 30% more efficient. In addition, the agricultural industry is actively introducing energy-saving machines and biofuels, which are obtained by growing certain crops [4].

By conserving resources, we can not only save money, but also improve the quality of life in the broadest sense of the word. Efficient lighting systems, waste recycling, improved product quality and sensible consumption of raw materials will help to avoid natural resource shortages.

It is a well-known fact that the problem of energy supply is exacerbated every year. The scarcity of this resource, its high cost and negative impact on the environment suggest that it is much easier to reduce energy consumption than to work on its production and fight against new problems. The total value of fixed assets in the energy industries (including pipeline systems) exceeds 25% of the assets of the global economy. Oil, for example, supports one-third of the capacities of the entire energy industry and one-fourth of the raw material base of the chemical industry.

Meanwhile, the long-term "energy race" has led to real threats to nature and the climate. Much has been said recently about global warming, which, as experts believe, is caused primarily by the environmental consequences of the extraction, processing and use of energy resources.

Large volumes of oil, gas, coal and oil shale combustion during their extraction and processing, constantly growing scale of use of products of primary energy raw materials cause complex damage to the environment and provoke global and irreversible natural and climatic changes. That is why the issues of development and rapid implementation of nature- and resource-saving energy technologies are more relevant now than ever before.

According to forecasts, by 2030 the indicators of energy consumption will increase by 65-70%. Moreover, emerging market economies (primarily China, India, Russia, Brazil and Mexico) are increasing their energy consumption at the fastest rate. However, it has been for decades that its integrated efficiency, that is, the total amount of energy product losses during extraction, use and pollution of the biosphere per unit of energy consumed, is the lowest in these countries. In any case, the integrated efficiency of energy consumption in industrially developed countries (South Korea, Taiwan, Malaysia, Singapore, and Brunei) is three times higher than in Russia, India and China. In addition, the same three countries lag far behind not only industrially developed countries, but also many developing countries in terms of implementation of environmental and resource-saving technologies in the energy sector and related industries. Including Brazil, which back in the mid-1970s established industrial production of alternative fuels from vegetable raw materials [5].

Currently, experts are actively working to find ways to reduce energy consumption and use it more rationally. Projects on this subject today in many countries, in particular in Uzbekistan, have found their solution; a policy on the use of renewable energy is actively pursued, which will achieve the desired result.

Another burning issue is the provision of drinking water to the population.

In many water basins of the world, the impact of climate change on ecosystems and society is becoming more and more tangible. Ensuring resilience to such changes is becoming one of the most important tasks, since climate change negatively affects the quality and quantity of water resources, water temperature and water-related ecosystems, leads to an increase in the scale and frequency of extreme weather events such as floods and droughts. The impact of climate change on water resources negatively affects many sectors, including agriculture, energy, fisheries, tourism and health care, as well as the state of biodiversity of natural ecosystems. Changes in water regimes and climate change do not recognize any borders. Therefore, it is necessary to establish trans boundary cooperation on adaptation to climate change, so that its participants can share the costs associated with the adoption of adaptation measures and receive the benefits from the adoption of such measures, ensure optimal locations of the relevant measures in a particular basin and avoid the negative consequences of taking unilateral adaptation measures [6].

In conclusion, I would like to note that when introducing new technologies, their complex nature should be taken into account, radically changing the approach to the traditional system of technology application. Introduction of new technologies is a long process, and it takes years to get significant results. At the same time, to postpone this work "for later" means to be hopelessly behind in the future.

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6. Water and climate change adaptation in transboundary basins: lessons learned and best practicesUnited Nations Publication ISBN: 978-92-1- eISBN: 978-92-1. Copyright © United Nations, 2015.