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Ecoanalytics as A New Area of The Analysis of Environmental Conditions at An Enterprise

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Abstract

This article studies the aspects of environmental safety issues. It characterizes the methods of assessment of environmental condition in Russia and abroad. The nature of ecological audit and its purpose are considered. The article highlights the problems of regional programs in Russia related to the improvement of the environmental condition. The essence of the analysis of the ecological state of the organization in Russia is revealed. The peculiarities of the appearance of a new analytical direction of eco-analysis within the organization have been identified and described.

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INTRODUCTION

For the first time people got seriously concerned about the environment in the 80s of the last century. Nowadays the environmental state in the world is one of the most topical issues. Among the most significant environmental issues there are the following:

- air pollution caused by an increasing number of cars, emissions, and, consequently there is an increase in disease rate among the population of industrial centres, particularly, children;
- soil pollution including with the use of chemicals in agriculture. Its substances have a negative influence on the soil. It results in the changes in the chemical composition of its components and natural landscape. The activity of microorganisms that live in the soil changes because the impact of chemicals leads to the extinction of the whole micro-systems. The impact of household and industrial waste is also very high. Its volume has grown up several times over the last decades. This issue is of high priority, particularly in northern Europe.
- water pollution generally caused by effluents of manufacturing enterprises, plastic waste resulting in soil pollution, mass death of mammals, birds and ocean pollution.

Nevertheless, it is impossible to eliminate completely, for instance, chemicals entering the external environment. The inevitability of such phenomena, on the one hand, and obvious unfavorable impact of all these factors on a human organism, on the other hand require measures limiting the content of harmful substances in the external environment. It is crucial that the lack of harmful effects would be guaranteed not only during the life period of a modern human but also for the next generations.

Currently the planet's resources are already used by 30% more than there are possibilities for their recovery (even if one combines natural and anthropogenic factors to restore natural resources). It means that it takes one year and four months to recover resources consumed by the humankind for a year. According to the mild future scenario created by the UN and based on the calculations, we will need two planets to meet the needs by 2050 in case there is the current consumption and growth of the population.

The present situation can already be called "ecological stalemate" because from the point of time factor the period during which people may turn all available resources into wastes is significantly shorter than the one necessary to convert the wastes into resources. That is, there is no alternative to exhaust resources.

Due to the stated trends many countries, single regions, and also subjects and institutions have started to raise public awareness of the need for introducing environmental restrictions to preserve natural resources. Today preserving the natural conditions of life is one of the most important tasks for all countries as it affects the health of the population, and, consequently, it promotes the growth of productivity and economical potential.

A new strategy for human development should be based on the awareness of natural scarcity. In addition, this determines the need to change the nature of existing needs and to move towards the notion of rational environmental needs. In this regard, in order to solve environmental problems it is crucial not only to perform monitoring functions for the assessment of the environmental state, but also to develop analytical tools for monitoring the environmental situation not only at the macro level but also within the enterprise.

Main aspects of the environment condition

All effects of human impacts on the environment currently requires continuous monitoring and control , first of all, from the state and also from every single organization. A significant amount of information received requires effective analytical processing in order to make accurate conclusions and work out strategic decisions. The assessment of the environmental condition in Russia is a bit different from other countries.

In foreign countries, the beginning of conducting the environment impact assessment is considered to be National Environmental Policy Act - NEPA enacted by the US Congress in 1969 and signed by the President in 1970. It was adopted

to coordinate the activities of federal agencies, to use an interdisciplinary, systematic approach that ensured the integration of natural and social sciences, habitat design in planning and decision-making.

In accordance with the NEPA, the initiator of economic activities, before deciding on the implementation of the project, in the implementation of which the bodies of the federal government are involved, must prepare a "Statement" on environmental impact (EIS). The NEPA states that the "Statement" should be a means of assessing environmental impact.

Canada, France, Netherlands, Great Britain and other countries started to use the process of environmental impact assessment in the system of decision making in the same years as the USA.

Also in the seventies, the companies began to be legally responsible for environmental damage in both Europe and Northern America. It was necessary for enterprises to improve the competitiveness of their product, as a result, they began reduce the price at the expense of non-production costs including environmental costs. Thus, it became necessary to evaluate the compliance of their activities with the norms of environmental protection legislation. This assessment, similar to the financial audit, was called an environmental audit.

Subsequently, the experience of using the environmental impact assessment methodology allowed the member countries of the EEU to adopt an international Convention on Environmental Impact Assessment in Transboundary context in 1991, which was signed by the Soviet Union as well.

Environmental audits have been applied in areas such as acquisition or conveyance of real estate, solutions to the problems of waste production and consumption, safety of products, control of occupational diseases, and control of pollution of natural environments.

In addition to the term ‘environmental auditing’, the term ‘health, safety and environment audit’ has come into use.

Environmental audits have been undertaken in many countries to assist businesses in managing the environment, reducing financial market risks, improving global competitiveness, strengthening environmental management, attracting private capital to manufacturing and power industries, industry and energy,. Moreover, they help to verify production safety and to implement it, to define the nature and extent of environmental health problems. Gradually, environmental audit has become an economic and legal instrument for promoting environmental protection activities of the enterprise in order to increase its investment attractiveness.

In Russia environmental audit has been applied since 1993. Currently its objectives are:

- to justify environmental policies and strategies,
- to analyze and asses environmental aspects of economic and other projects;
- to analyze and evaluate environmental regulations,
- to justify and initiate environmental activities,
- identify environmental problems of production and territories.

In Russia, the environmental analysis, that is differentiated analysis of current environmental situation, is conducted along with the environmental audit. It suggests studying the condition of natural resources and processes because of anthropogenic impact. Most often, environmental analysis involves an analysis of the investment project, where its main objectives are to identify potential environmental damage, the measures necessary to prevent and/or mitigate the project, to determine the period of implementation and operation of the project.

Generally, investment projects that require environmental analysis are divided into two groups:

1. projects that have only environmental objectives, for example, projects to establish protected areas or to preserve rare animal species;;

2. projects having a negative impact on the environment, ecosystems and their functions:

- on providing with natural resources (fossils, forests etc);
- on ecosystem functions - pollution and waste assimilation, recreation, geochemical and geophysical cycles of substances;
- on providing with natural services (esthetic component).

As is known, the assessment of investment project efficiency is based on the ratio of net profit

to production costs resulting from positive environmental effects or losses.

The assessment of prevented economic damage involves an assessment of the existing environmental conditions in relation to the project, as well as the possible direct and indirect impact of the project on the environment, taking into account opportunities for environmental improvement. If you ignore at least one of these components, it can lead to an overestimation of the project's efficiency and a decrease in its ecological safety.

The environmental and economic impact assessment of the project on the natural environment is carried out at the stage of the project cycle. It suggests:

- analyzing the data of such project expert appraisals as social, technological and others;
- ·assessing natural and climatic features of the environment and its impact on the project;
- оценку природно-климатических особенностей окружающей среды и ее влияния на проект;
- economic (quantitative) assessment and qualitative analysis of the impact of the project on the environment;
- analyzing environmental risks and uncertainties;
- assessing environmental efficiency of the project;
- post-project environmental audits.

Such environmental analysis as an assessment of an investment project is more typical for the practice of Russian enterprises. First of all, organizations that are classified as hazardous production facilities in accordance with the law are subject to such analysis.

In addition to environmental analysis of hazardous industries a General analysis of the environmental condition of the company, which involves the analysis of production (technology analysis), efficiency analysis of production management, analysis of the state of systems engineering and energy supply in order to ensure environmental protection is often carried out. Moreover the analysis of the relationship between environmental impact standards and the dynamics of updating and expanding the regulatory framework; as well as analysis of the relationship between the level of environmental impacts and the stability of ecosystems and populations are also carried out.

A sample list of analytical indicators of ecological safety of production and environmental policies of the enterprise is formed only on the basis of the mode of their operation, and it is usually unique for each individual enterprise, due not only to the peculiarities of its activities, but also to features of territorial distribution, since each territory has certain environmental problems.

In order to assess the effectiveness of an organization's environmental strategy, two groups of indicators are used: 1. indicators of enterprise management efficiency that characterize the efforts and actions taken by management to prevent pollution (with mandatory quantitative and qualitative expression);

2. indicators that characterize the environmental and economic efficiency of the enterprise

Indicators of enterprise management efficiency can be:

- a number of management corrective actions to prevent (prevent) pollution and, consequently, reduce economic damage;
- a level of compliance with regulatory legal acts in order to protect the environment, which can reduce fines; * number of management levels in an organization with a specific responsibility to prevent pollution;
- a number of implemented measures to prevent environmental pollution (or correct the consequences of pollution) and their payback;
- a level of implementation of specialized internal and external environmental standards in the company's operation, which affect environmental payments;
- a number of offers from employees to prevent pollution, etc.

In order to conduct a narrowly focused analysis of the management of the organization's production activities aimed at preventing pollution, the following indirect indicators can be used:

- a number and / or amount of fines for environmental damage caused;
- costs (capital and current) related to the environmental components of the production process;
- investment return in projects aimed at improving environmental performance;

- savings achieved by reducing the amount of resources consumed, preventing environmental pollution, or waste-free production;
- profit from sales associated with the production of new or associated products that meet environmental performance requirements;
- the amount (or dynamics of change) of research and development funds spent on environmentally significant projects;
- responsibility for the state of the environment, which includes substantive consequences for the financial condition of the organization.

Problems of environmental assessment

In addition to these procedures in the field of environmental analysis, organizations in Russia are subject to planned or periodic monitoring by specially authorized state bodies. However, the interest of the organizations themselves in conducting environmental research for territories or industries is currently very low and does not change over time, despite the measures taken. This situation is typical for many areas of the country.

Each region of the country has developed strategies for their development, one of the mandatory aspects of which is the preservation of the environment and natural resources, which describes the problems, planned activities and expected results of their implementation. Within the framework of these strategies, there are regional programs related to improving the environmental condition, which describe the goals, objectives, and targets. At the same time, most of them are ineffective, since the goals set in them have a weak link, both with the intended activities within the programs and with the targets.

As an example, we can consider a regional program of the Rostov region "protection of atmospheric air in the Rostov region" with the goal of "reducing the level of air pollution and anthropogenic load on the environment". Program objectives: 1. improving the quality of atmospheric air and preventing its harmful effects on human health and the environment; 2. assessment of the state of the atmospheric air in order to make timely management decisions to prevent negative effects on the atmospheric air in the course of economic activities.

Targets:

- the share of captured and neutralized air pollutants in the total amount of outgoing pollutants from stationary sources;
- emissions of harmful (polluting) substances into the air from stationary sources in relation to 2007;
- a number of permits for emissions of harmful (polluting) substances into the atmosphere by stationary sources located on facilities of economic and other activities that are not subject to Federal state environmental supervision;
-a number of environmental samples obtained on the basis of monitoring studies received for analysis by the Ministry of natural resources of the Rostov region;
- a number of agreements on information and methodological exchange on environmental monitoring with economic entities operating in the Rostov region; - a number of stationary air observation posts installed in the cities of the Rostov region;
- a number of information materials on activities for the protection of atmospheric air published in the media, on the official website of the Ministry of natural resources of the Rostov region.

Main activities:

1. Issuing permits for emissions of harmful (polluting) substances into the air.
2. Monitoring of environmental condition, monitoring of atmospheric air; the development of a network of observations of air quality; monitoring of air quality in 2017 and 2018 using the automatic monitoring stations of the atmospheric air pollution; analysis of the results of the atmospheric air condition monitoring.
3. Minimization of the negative impact on the atmospheric air: analysis of the results of monitoring the state of the atmospheric air; implementation of measures aimed at reducing emissions of harmful (polluting) substances into the atmospheric air during periods of adverse weather conditions in the Rostov region.
4. Informational support of atmospheric air protection activities: placement of information about atmospheric air protection activities in the Rostov region in the mass media; informing the population, municipalities and economic entities about adverse weather conditions.
5. Holding annual tree planting days in the Rostov region.

6. Informing of bodies of Executive power and bodies of local self-government on the international day without a car "European day of the pedestrian".

As it can be seen from the list of targets and planned activities, almost all of them involve only monitoring the status and number of samples, permits issued, posts for this monitoring, the number of emissions, etc. That is, there are only quantitative indicators and characteristics that can characterize the existing situation, and can not ensure the achievement of the program's goal - reducing the level of air pollution.

In addition, neither the program objectives nor any target indicator provides a reduction of any parameter. Also, the program targets do not contribute to the fact that a single enterprise has an incentive to increase its level of environmental friendliness. Therefore, it is necessary to supplement existing programs with a system of incentives for organizations to increase the level of environmental friendliness of the organization.

RESULTS AND DISCUSSION

At present, issues of environmental friendliness of enterprises both in Russia and around the world have become of paramount importance. Environmental audit, which is used to assess the environmental condition, allows you to assess the ability of a particular production to self-cleaning, reduction of the impact on the environment. At present, it should be considered as an environmental control system. In Russia, its use in most cases is not mandatory. As a rule, it is carried out if it is necessary to carry out licensing, restructuring or bankruptcy. Based on the results of the environmental audit, the fact of compliance or non-compliance with current environmental standards is established. At the same time, conducting an environmental audit does not allow to explain the reasons for incompatibility with environmental standards, and especially about the changes that need to be made to improve the situation. This applies to environmental audits both in Russia and abroad.

Currently, a new direction for assessing the level of environmental friendliness of an organization - Eco-analytics-is becoming relevant. This direction will be of great social importance. The field of activity of ecoanalytics is to identify the causes of incompatibility of the enterprise with the current environmental standards and find ways to solve this problem. Ecoanalytics should include issues of assessing the level of ensuring a safe work environment; conducting environmental studies and providing expert opinions; evaluation of business risks associated with a low level of environmental performance; analysis of possibilities for businesses to improve their environmental standards and the development of program improvement; training employees to improve environmental efficiency. Specialists engaged in this type of activity will need to combine the knowledge of both an ecologist and a business analyst. The most popular fields for ecoanalytics should be:

- construction – for the analysis of the building site (determination of distance from nature protection zones, reservoirs, analysis of soil, air and water at the site) and selection of the most environmentally friendly building materials;
- processing activities-to study the quality of products, technologies used, the negative impact on the environment, to draw up a plan for optimizing and improving the quality of production processes.

Ecoanalytics will allow you to assess the environmental safety of an organization for the environment and make predictions about potential threats to the environment.

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