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ScienceDirect

Procedia Manufacturing 21 (2018) 494–501

Procedia MANUFACTURING

www.elsevier.com/locate/procedia

15th Global Conference on Sustainable Manufacturing

# The Assessment Methods of the Level of Countries Environmental Safety

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**Abstract**

The article considers the problems of the analysis of the environmental safety in Russia against the world community. The research describes the experience of formation of the environmental indicators by various international organizations (IEA, OECD, World Bank, ECE etc.). A parallel was drawn with the Russian statistical database and the differences were revealed. A unique indicator system was formed, it is reasonable to use it at the Russian and international level for the analysis of the environmental safety of the territories. The suggestions for enhancement of the indicator system, used for assessment of the environmental state at the world and domestic level, were developed. The algorithms of measurement of the environmental sustainability of various territorial units were offered. A complex of economical-mathematical and statistical methods was used to carry out the study. The groupings, typologies and classifications of the countries by the level of the environmental sustainability were obtained as a result. The problem points, aggravating the environmental situation of the territories under investigation, were also revealed, and the ways to overcome them were pointed out.


Peer-review under responsibility of the scientific committee of the 15th Global Conference on Sustainable Manufacturing (GCSM).

*Keywords:* environmental safety ; methodology ; system of indicators ; environmental factors ; methodological approach, measurement of the environmental safety level.

## 1. Introduction

The need for research of the international experience in the field of the environmental safety is stipulated by the following:

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2351-9789 
Peer-review under responsibility of the scientific committee of the 15th Global Conference on Sustainable Manufacturing (GCSM).
10.1016/j.promfg.2018.02.149

- there is no adequate or comparable indicator system, making it possible to carry out international and regional comparisons since the environmental safety still has not obtained overall statistical and economical assessment;
- the analytical tools, macro- and meso-economic indicators in current use don't make it possible to obtain comparable results since they are aimed at solving narrow problems, and their experience can't be extended to other territories;
- the issue of the development of the generalizing indicator for the environmental safety characteristic remains unsolved;
- scientific publications of the researchers don't fully cover the matters of typologization of the territories by the level of the environmental safety, forming the information basis for effective management decisions taking in this field, as well as forecast and modeling of the measures to increase environmental safety of the territories.

As a result, there is a need for development of statistical accounting and extension of the analysis of the environmental safety conditions, as well as provision of its comparability by territories and modernization of the whole system of information support of regional and national administrating authorities on this basis.

Notwithstanding the unresolved issues in this sphere, domestic and international scientists made significant progress. Li Hongwei, Lv. Mou and Ye Song suggest carrying out assessment of the environmental safety depending on climate conditions of the territories. Besides, the territories under investigation are classified from very safe to dangerous by the level of the environmental safety [1].

Jiang Mingjun considers the environmental safety though three categories: nature eco-safety, stipulated by astronomical and geological factors, including volcanic eruptions, earthquakes, storms, tsunami, extreme weather events; eco-system safety, which includes safety of the forestry system, safety of the marine system, safety of the swamp area and safety of the microbiological ecosystem; national environmental safety, which includes food safety, protection of water resources, environmental security, safety of species, life safety, city safety, nuclear and radiation safety, natural heritage safety, resource safety and sustainable development [2].

Elizabeth L. Chalecki considers the following components of environmental safety: national natural resources, food safety, climate change (global warming) and other accompanying infliction of harm to ecology [3].

Yoichi Kaya offered the equation for assessment of the environmental safety, which is based on emissions of CO2 and primary energy consumption, exclusive of such environmental parameters influencing GDP as introduction of environmental innovations, costs of environmental protection etc. [4].

The domestic scientists made attempts of development of the generalizing indicators of the environmental safety: an eco-economic indicator of regions of Russia (S.N. Bobylev, V.S. Minakov, S.V. Solovyeva, V.V. Tretyakov); an integrated indicator of quality and degree of environmental sustainability of the environment of the region (I.N. Rubanov, V.S. Tikunov); an integrated indicator of the environmental safety of the region (T.A Komarova, E.A. Sysoyeva); an integrated indicator of assessment of the environmental component of welfare of population (Yu.S. Vlasov) etc. [5, 6, 7].

Impossibility of consideration of multidimensionality of the environmental safety of the territories, for example environmental innovations, climate, biodiversity, costs of environmental protection etc. can be viewed as shortcomings of these developments. Besides, these assessments aren't adapted for systems of various level of aggregation (level of municipalities, federal districts, countries).

## 2. Review of information databases, containing records of the environment in Russia and in the world

16 international databases, including the database of the Statistical department of the UN, Economic and Social Commission for Asia and the Pacific (ESCAP), Euroasian Economic Commission (EEC) of the UN, Food and Agriculture Organization (FAO) of the UN, International Monetary Fund (IMF), International Labor Organization (ILO), UNESCO, UNIDO, World Bank, World Health Organization (WHO), World Trade Organization (WTO), Eurostat, CIS Statistical Committee, Organization for Economic Cooperation and Development (OECD), International Energy Agency (IEA), the Report on human development were studied [8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19].

Among them only the websites of FAO of the UN, UNECE, World Bank, Eurostat, CIS Statistical Committee, OECD, IEA and the report on human development contain information on the indicators, characterizing