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# Regional Environmental Features and Health Indicators Dynamics. Pollution of the Earth's Atmosphere and International Air Quality Standards

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**Abstract.** The article conducting the problem of maintaining health and increasing the life expectancy of the population continues, which is relevant at the present time. There are many important questions in the world to which countries should jointly seek answers, but one of the main areas of interaction between countries is the environment. According to the world health organization data for 2014, approximately 3.7 million people die each year in the world due to air pollution. The level and dynamics of indicators of air quality can be used to assess the situation in the region or in the territory, to analyse the effectiveness of environmental activities, for competent and effective planning of the system of actions to improve the quality of life of the population.

## 1. Introduction

Ecological environment is system of support for life with direction to physical, geographical, chemical metabolism movement of nature. Protection of the environment depends on responsibility of the activists making such an impressive impact the nature. Forest system plays an important role in the global ecosystem, by filtering air and noise pollution, providing a habitat for wildlife, helping to recharge streams and groundwater, influence climate at local, regional, and global levels.

The environmental sustainability index of the WEF is an indicator of the overall development of achievements in the field of environmental protection, which takes into account the weight and compliance with environmental standards, the level of development of the tourism industry, the concentration of particulate matter in the air, the number of approved environmental agreements, the state of water resources. Out of 136 countries of the world received the highest environmental assessment in 2017 year: 1) Switzerland; 2) Austria; 3) Norway; 4) Luxembourg; 5) Finland; 6) Sweden; 7) Germany; 8) Denmark; 9) Netherlands; 10) Slovenia. Estonia, the Czech Republic and Georgia also show an exceptional interest in supporting the environment – 12, 14 and 42 places respectively. Russia – 71, the critical environmental situation is observed in China (132), Pakistan (133), India (134), Kuwait (135) and Yemen (136).



## **2. Global environmental problem leading to oxygen starvation of nature**

Atmospheric pollution is interpreted as the introduction into the air of chemical, biological and physical substances that do not belong to it, that is, a change in their natural concentration. But the most important thing is not the change in concentration, which, no doubt, occurs, but the reduction in the composition of the air of the most useful component for life – oxygen. After all, the volume of the mixture does not increase. Harmful and polluting substances are not added by simple addition of volumes, but destroy and take its place. In fact, there is and continues to accumulate a lack of food for the cells, the basic food of a living being.

Air pollution can be physical, chemical and biological. The physical includes dust and solid particles, radioactive radiation and isotopes, electromagnetic waves and radio waves, noise, including loud sounds and low-frequency oscillation and thermal, in any form. Chemical pollution is the ingress of gaseous substances into the air: carbon monoxide and nitrogen, sulfur dioxide, hydrocarbons, aldehydes, heavy metals, ammonia and aerosols.

### *2.1. Deforestation and the consequences*

Deforestation is one of the most pressing environmental problems on the planet. Its impact on the environment is difficult to overestimate. No wonder the trees are called the lungs of the Earth. They generally constitute a single ecosystem that affects the life of different species of flora, fauna, soil, atmosphere, water regime.

Many people do not even realize what a disaster will result in deforestation, if not to stop it. At the moment, the problem of cutting down trees is relevant for all continents of the earth, but this problem is most acute in Western Europe, South America and Asia. Intensive destruction of forests leads to the problem of deforestation. The area freed from trees turns into a poor landscape and becomes uninhabitable.

To understand the disaster, there is a number of facts: more than half of the world's rainforests have been destroyed, and there are hundreds of years to restore them; now only 30 % of the land is occupied by forests; regular felling of trees leads to an increase in carbon monoxide in the atmosphere by 6 - 12 %; every minute the territory of the wood which on the sizes equals to several football fields disappears.

## **3. Comprehensive influence of Industrialization and urbanization to the Earth atmosphere and**

The economic globalization is the process of integration of global links that binds all countries, corporations, and industrial mechanisms. This links combine manufacture, trade, financial markets, technologies, and living standards. Communications have built new international bridges by traditional and modern tools; products have attained international appeal encouraging appropriate activities around the world. Transportation links let individuals communicate with unprecedented ease. A global strategies coupled with production and distribution sharing are common.

Human activities have some impacts on the eco-environment and the process of industrialization exhausting the natural resources. The process of industrialization is taking an amount of natural resources and returning to the earth the wastes and pollutions, and damaging the regenerating abilities of the environment; when a couple of urbanization with its frequent companion urbanization, then there are two processes that influence human life and effected ecological changes.

### *3.1. Air Quality Index's interregional analysis*

The most central pollutant involved in global climate change is CO<sub>2</sub>, carbon dioxide. The energy use is highly correlated with level of industrialization. The analysis of the air pollution is showing the quality of air and geography of the most interrupted regions in the world. Several countries analysis showed the difference in air quality and their level of responsibility for environment protection in region.

The result of analysis is showing by table 1 (table 1 – Air quality index in different regions, 2019, January). Air quality is the defining argument for additional measures to protect the environment. Air

quality directly affects human health and livelihoods. And as the analysis shows it is necessary to control the safety of human life at the international level.

Table 1. Air quality index in different regions (2019, January).

Country, City	AQI / Deviation from norm							Level
	AQI	PM2,5	PM10	O3	NO2	SO2	CO	
China. Beijing	411	411/411	208/225	1/15	69/73	10/16	27/31	Hazardous
Denmark. Copenhagen	26	26/48	27/71	8/22	29/49	1/2	3/5	Good
France. Paris	52	52/129	14/63	11/39	18/57	1/3	0/6	Moderate
India. Pusa	195	195/440	129/492	48/48	25/102	10/14	9/46	Unhealthy
Japan. Tokyo	87	87/95	30/38	4/26	37/45	2/4	7/15	Moderate
Russia. Moscow	50	50/55	14/15	-	-	1/2	4/5	Moderate
South Africa. Enseleni	50	-	21/52	-	-	1/2	-	Moderate
Singapore. Center	46	46/78	25/25/	10/10	-	-/1	-/27	Good
Thailand. Bangkok	153	153/183	78/95	34/43	23/46	2/3	0/15	Unhealthy
Vietnam. Ho Chi Minh	154	4/167	-	-	-	-	-	Unhealthy

Based on analysis the highest results are in China, where is the highest level of manufactures. So, Air pollution today prevents photosynthesis and can destroy the food production system in China, scientists warn. India is on the second place. In Beijing, the concentration of small particles – those that can penetrate the lungs and the circulatory system – reached 411 micrograms per cubic meter. The safe level recommended by the world health organization is 25. According to the Chinese state news Agency Xinhua, 147 industrial companies in Beijing have cut or suspended production.

On the second place is India. The state of the environment in India depends on many factors. But the main of them should probably be attributed to three factors. First, it is the duration and intensity of agricultural use of the territory. Secondly, it is a demographic explosion of the second half of the XX century, which further increased the load on the territory. Thirdly, it is the accelerated process of industrialization of the country, until recently based mainly on "dirty" heavy industries and to a certain extent connected with environmental imperialism, i.e. with the policy of transferring such industries from highly developed to developing countries.

On the third place are Thailand and Vietnam. Industrial growth has created high levels of air pollution in Thailand. Vehicles and factories contribute to air pollution, especially in Bangkok. The pollution control Department and other agencies have developed standards to reduce air pollution. The standards focus on moving to lower-emission vehicle engines and improving public transport. In Vietnam, the main causes of climate change and environmental imbalances are forest fires and

deforestation, while forests serve to regulate oxygen production. In this case, to reduce the rate of climate change, it is necessary to improve the climate culture of the population, to develop measures to protect the environment. Quite often, cutting down trees is illegal.

Many countries in the world lack institutions and people who can control deforestation. The main result of cutting down trees is deforestation, which has a lot of consequences: climatic change; environmental pollution; ecosystem change; destruction of a large number of plants; animals are forced to leave their habitual habitats; the deterioration of the atmosphere; deterioration of the water cycle in nature; soil destruction that will lead to soil erosion; Russia is one of the leading wood producers. Together with Canada, these two countries contribute about 34 % of the total amount of exported material on the world market. The most active areas where trees are cut are the territory of Siberia and the Far East.

#### **4. Conclusion. The concept of contribution forces. Environmental factors of public health**

The ecological factor is considered as the main cause of dysfunction and disease. At the moment it is accepted that 90% of all malignant neoplasms are caused by adverse environmental factors. Among the environmental factors affecting the human body, there are factors of inanimate nature (abiotic) associated with the action of living organisms (biotic) and the man himself (anthropogenic). Abiotic factors – temperature and humidity, magnetic fields, gas composition of air, chemical and mechanical composition of soil, altitude and others. Biotic factors-the impact of microorganisms, plants and animals. Anthropogenic environmental factors include soil and air pollution by industrial and transport waste, the use of nuclear energy, and everything related to human life in society.

The beneficial effects of the sun, air and water on the human body do not need to be described for a long time. Most of them are associated with the impact of the person – industrial waste falling into water sources, soil and air, the release of exhaust gases into the atmosphere, not always successful human attempts to curb nuclear energy. Preservation of the environment is an important part of the development of the tourist attractiveness of any region.

##### *4.1. International Environment Agreements*

According to all the segments of research there is the scheme as the order of cooperation in the sphere of environmental protection: as the urbanization is the process of development industrial, economic, manufactural, transit mechanisms between all collaboration levels within the framework of a country, one region or group of regions, the urbanization connected to one by one single city, and industrialization includes one by one of cooperation regions.

Key International Environment Agreements: Convention for the Regulation of Whaling (1946); Convention on the Prevention of Marine Pollution (1972); Convention on International Trade in Endangered Species (1973); Convention for the Prevention of Pollution from Ships (1973); Convention on Long-Range Transboundary Air Pollution (1979); Vienna Convention for the Protection of the Ozone Layer (1985); Basel Convention for the Control of Transboundary movements of Hazardous Wastes and their Disposal (1989); Framework Convention on Climate Change (1992); etc.

There is a comprehensive scope of various declarations. Certainly, all of the components of nature are common priority, and the “gold middle” for the dialogue, cooperative contracts directed to protection of the environment in any part of such a great and comprehensive meaning of that – the Earth.

Today, such scientific areas as social ecology plays a significant role in the education of the correct attitude of man to nature and this discipline is only gaining popularity. Significant influence on the development and formation of this scientific field is the work of Vernadsky "Biosphere", which the world saw in 1928. This monograph presents the problems of social ecology. Further research scientists consider such problems as global warming and pollution of the biosphere, the cycle of chemical elements and human use of natural resources of the planet.

A special place in this scientific specialization is occupied by human ecology. In this context, the direct relationship between people and the environment is studied. This scientific direction considers man as a biological species. This is what is important to understand the person that he lives in a common unique bio system, being the most important biological species that can both preserve and destroy the biological world.

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