
NOOSPHERIC WORLDVIEW AND SOLUTION OF GLOBAL ENVIRONMENTAL PROBLEMS

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(Received 11 July 2017, revised 1 November 2017)

Abstract

The concept of the noospheric balance as the main tool for solving global environmental problems was proposed in the doctrine of V.I. Vernadsky. Noospheric balance is a reasonable consumption of material and energetic resources and their accelerated reproduction on the basis of the scientific and technological progress achievements. The noospheric balance components are directly related to the environmental culture and religion. A new noospheric worldview underlies application of the noospheric balance to the solution of global environmental problems. The same attitude to the environment brings religions and Science closer together and inevitably takes us to the noospheric worldview as a doctrine of the faith in the power of mind. The second component of the noospheric balance is associated with the scientific and technological progress, primarily in the energy sector. The humanity will obtain an environmentally-friendly inexhaustible source of energy which is mass-to-energy transformation ($E = mc^2$) that will allow solving any global problems. Such research is already underway.

Keywords: noosphere, balance, global, worldview, progress

1. Introduction

Human activities have now reached a global scale of impact on the biosphere. It alters the nutrient cycle, water balance, exerting a profound effect on soil, vegetation and fauna. Human activities have created new sources of toxic pollution of the biosphere together with physical effects such as radiation; ultimately it can threaten the existence of a human being itself. The enormous importance of such issues as strengthening of human health, combating chronic diseases, pathological aging is evident. The development of new extreme planet and outer space regions poses new challenges to improving of human existence conditions. Now the urgent problems are fresh water, clean air, green cover of the planet, the environmental pollution, approaching the critical utilization limits of non-renewable ore and energy resources. The accumulation of waste is particularly dangerous. 'Garbage islands' have already appeared in the oceans,

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and the accretion of waste with geological rocks gave rise to the concept of ‘anthropocene’.

The global nature of environmental problems is not an abstraction as every day thousands of people become victims of natural disasters. Earthquakes and tsunamis not only cause great damage, but also raise the ways of developing energy issue and bring global environmental problems to the first place among all global problems of mankind. The human mind, as the main component of the Noosphere, is faced with the choice of a paradigm for solving global environmental problems.

Noosphere is an area of interaction between society and nature, within which a reasonable human activity becomes the determining factor of development. V.I. Vernadsky wrote: “Mankind, as a living matter, is inextricably linked with the material and energy processes of a certain geographical shell of the Earth – with its biosphere. It cannot be independent of it even for a minute.” [1] Noospheric worldview is directly related to sustainable development [2].

2. Ways to solve global problems

The ways of solving global environmental problems are presented in Figure 1.

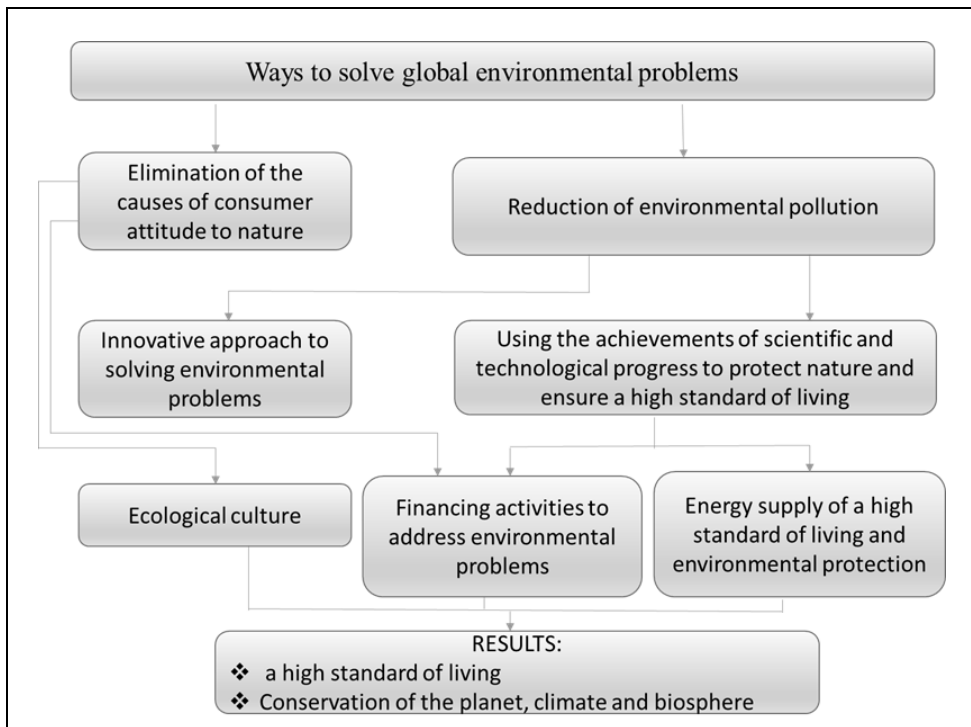


Figure 1. Ways to solve global environmental problems.

The author proposes **an innovative approach** to solving global environmental problems, based on the noospheric worldview. It is the noospheric balance. **The noospheric balance** is a balance between the emerging need for new ideas, transforming the world, and their appearance and implementation. It must ensure the advanced reproduction of resources. Noospheric balance can only be achieved through scientific and technological progress (STP), which in turn is impossible without the development of Science and education.

3. Noospheric balance

Noospheric balance is the combination of a reasonable consumption and rapid (advanced) reproduction of resources. Reasonable consumption of all resources is the basis of rational nature management, i.e. reasonable consumption of water and natural resources – habitat conservation.

Reasonable consumption is based on the achievements of STP and the development of environmental culture. STP allows creating new products, services and processes that require less energy and material resources, i.e. water, minerals, flora and fauna products with the same consumer value. The most important element of reasonable consumption is the formation and education of environmental culture in all people's mind.

Along with a fairly widespread interpretation of environmental culture as a common culture of interaction between society and the natural environment, there are several dozens of environmental culture definitions given by scientists-ecologists (environmentalists) and educators.

N.F. Reimers is one of the most encyclopaedically educated theorists of the general ecology, the systematiser and populariser of ecological knowledge; he considered 'environmental culture' as a stage and an integral part of the world culture development, characterized by a general awareness of the pressing importance of environmental problems in the life of mankind's future development [3, p. 28].

Academician N.N. Moiseev identified environmental culture with its ideal state, corresponding to the triumph of the ecological imperative of sustainable development, i.e. with the future state which is unknown how to achieve [3, p. 29]. The principle of the 'ecological imperative' is the unconditional recognition that certain types of human activity, especially the degree of their impact on the environment, must be strictly limited and controlled.

Academician of the Russian Academy of Education B.T. Likhachev considered environmental culture as a derivative of the human's environmental consciousness [3, p. 29].

People, who have not formed an environmental culture, may have the necessary knowledge but not own them. A person's environmental culture includes his environmental consciousness and ecological behaviour. The core of the environmental culture of a human being and society is the environmental worldview. It is important to remember here that the ecological education is

received, and the environmental culture is planted (inculcated) from the cradle by everyone in his own family. Ecological education begins with childhood, when the norms of behaviour and habits of the child are formed, the understanding of good and evil, right and wrong. Environmental principles should be embedded in the consciousness of society.

The main objective in the field of environmental culture formation is the efforts integration and joint responsibility of state agencies, professional and public associations, and citizens for the formation of environmentally responsible worldview of the population of all ages. It requires the solution of the following interrelated tasks:

- ecological education;
- preschool, school and after-school ecological education;
- professional retraining and advanced training of managers and specialists responsible for decision-making in the field of environmental management, protection and environmental safety of population;
- continuous and purposeful work at all levels and structures of executives and legislative authorities to develop an economic mechanism and regulatory framework in the field of environmental management, protection and ecological safety of population;
- dissemination of ecological knowledge;
- attracting the media to consolidate the population around the issue of preserving and improving the environment.

Religion, along with Philosophy, is the primary basic of environmental ethics. In their essence, the religion fundamentals are the most similar to the fundamentals of morality. Directly or indirectly, religion can be a powerful driving force for the conservation of the environment, caring attitude to all living things on the Earth. Ethics, encased in religion, is able to awaken the human consciousness unlike the usual material and technological thinking.

Religion tells people that their control over living and non-living world is not unlimited and inspires the idea that the goal of life is not the maximum consumption. Religion teaches virtue, developing restraint, modesty and freedom from selfishness.

World and local religions, each in its own way, offer a unique set of moral values, ecological and ethical rules to control people in their relationship with nature. There are deeply moral biblical expressions: “Stop collecting treasures for your own benefit on Earth”, “What will it profit a man if he gains the whole world and forfeits his soul?”, “And man has no advantage over the beasts”.

One of the most environmentally oriented religions is paganism which asserts life-promoting values such as the sacredness of land, water, forests, respect for animals and plants, prudent use of natural resources, the understanding oneself as a small part, not the master of the world. Pagans build their relationship with nature on the principles of mutual respect, delicate balance. They do not take more from nature than they need and do not take anything without asking. They try to return to nature what was taken as if they pay their debt. Nature for them is a dwelling place of divine powers.

A careful modern reading of the Bible and the works of various Christian saints reveals the environmental aspects of Christianity. For example, the Bible explains the reasons why it is necessary to take care of our planet: firstly, the whole Creation is one, and secondly, the Creation is good. From the standpoint of the ecocentrism philosophy, one can also consider the well-known actions of Noah, who collected all earthly 'biodiversity' during the Flood into his ark. There are known the sayings of the Holy Scripture that "a righteous man regards the life of his animal" and the Commandment "Love your neighbour" includes all neighbours: animals and plants, too.

In 1980, the Vatican officially named the Christian theologian, and Saint Francis of Assisi 'the patron of ecologists' because he taught love and compassion for all living things, he professed the idea of the quality of all living creatures, including humans.

There is a religious and philosophical doctrine that unites and sometimes identifies God and the world – pantheism. It expresses the concept that 'God' is best understood in the rapprochement with the Universe. Despite the existing different currents within pantheism, the central ideas in most forms of pantheism are constant: the Universe as a comprehensive unity and the sanctity of nature. Pantheism rejects anthropocentrism, recognizing the fundamental unity of all living things and the need for respectful treatment of nature.

The focal points for environmental ethics are the Eastern religions – Hinduism, Buddhism and Jainism. The principle of life holiness is one of the foundations of the Hindu religion. The inadmissibility of cruel treatment of animals is indicated by the idea of reincarnation – the transition of the human soul to an animal. Jainism forbids killing of a living creature, even an animal. The Hindu Holy Scriptures said: "A man who kills a living creature, polluting wells and ponds, reservoirs and destroying gardens certainly goes to hell".

In Buddhism, one of the important ethical principles is the principle of nurturing feelings of compassion for all living beings and non-violent attitude towards plants. Kindness to animals among Buddhists is a source of merit – the merit that people need to improve their destiny in the cycle of rebirth. Buddha and his followers consider the beauty of nature to be a source of great joy and aesthetic inspiration. Buddhists believe that environmental pollution is caused by the pollution inside a person.

It is appropriate here to recall that at the beginning of the new millennium Dalai Lama formulated some rules of life, 4 of which are clearly 'green' rules. These 'green' rules are:

- Do not ignore the responsibility for your actions.
- Remember that what you want is not always what you really need.
- Feel free, but do not break boundaries.
- Be gentle with the Earth. Love it.

According to Islam, the need to protect nature can be formulated as follows:

- The environment is God's creation and protecting it means preserving its values as a manifestation of God's spirit.

- All parts of nature exist to praise their Creator.
- All laws of nature are created by God and are based on the concept of absolute life expectancy; attempts to violate the law of God must be stopped.
- Humanity is not the only community of living beings in the world. As the Prophet Muhammad believed, all living consciousness are worthy of protection and gentle treatment.
- The balance of the Universe created by God must be preserved, as 'Everything is measured by him'.

The Quran teaches 'If you love Allah, then you cannot help but love his creatures'.

Today, the most pro-environmental religion is Shintoism. Its basis is to deify the natural forces and phenomena and worship them. It is believed that many things have their own spiritual essence – 'kami'. Is not it the 'ecological niche' of faith? The main spiritual attribute of Shintoism is life in harmony with nature and people. 'Kami' are immortal and are included in the cycle of birth and death through which everything in the world is constantly renewed. However, the current cycle is not infinite, and exists only until the destruction of the Earth, after which it will acquire other forms. There is no concept of 'salvation' in Shintoism; instead, everyone determines his natural place in the world with his feelings, motivations and actions.

All these deeply ethical and moral religious postulates are essentially a summary of the above-mentioned laws of Ecology, the sources of the formation of an environmental culture of human life.

The noospheric worldview is also **a faith** – a faith in the mind of every person, and in **the mind** of all mankind contained in the noosphere.

The most important, most necessary part of the noospheric process is the unconditional awareness of the whole mankind's and each person's role and responsibility for the noosphere formation. All the accumulated experience of mankind – spiritual, cultural, individual – must be carefully studied and used to the maximum to solve this grandiose task. One must learn to understand thoughts and ideas expressed not only in different languages but also in different conceptual systems.

The second component of the noospheric balance is ***the outstripping reproduction of resources***.

The most important role in human activities is played by: 1) the energy resources, 2) the ecological resources, 3) the resources for obtaining food, and 4) the resources for the production of materials necessary for human life.

Our planet draws energy resources from two sources: the Sun and the inner hot core of the planet. Thermonuclear reactions raging on the Sun give a powerful flow of energy, which by photosynthesis turns into a green mass of plants out of which the resources of organic fuel (oil, gas, coal) were formed.

The current annual consumption of natural energy resources is 0.0005 of the organic fuel resources (oil, gas and coal combined) or 0.003 of uranium resources (Figure 2). However, these exhaustible energy resources in total do not

constitute a fifth of the annual flow of solar energy to the Earth which generates wind energy, hydropower and photosynthetic energy. But there is also huge geothermal energy of the Earth, the large-scale development of which is just beginning.

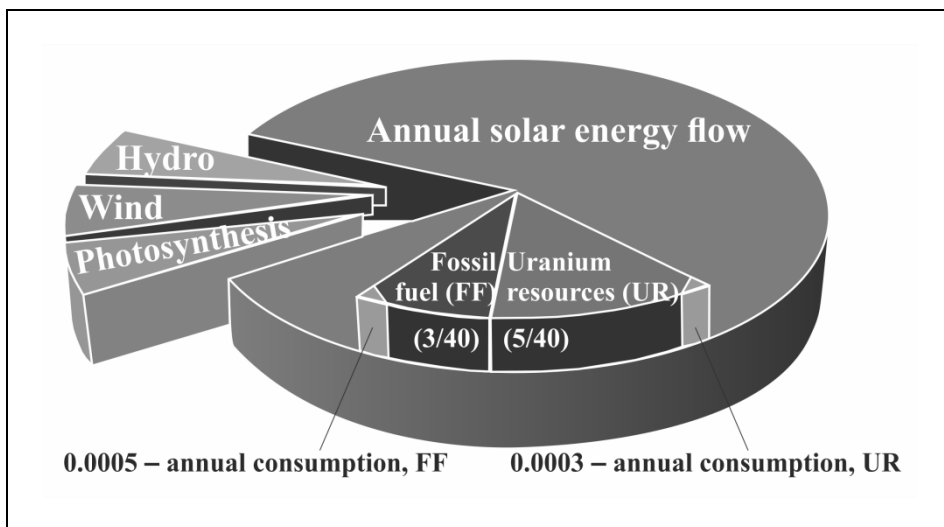


Figure 2. Balance of energy sources on the Earth.

Energy sources are very ambiguous in terms of capacity (Table 1).

Table 1. Energy sources characteristics.

Generation method		Greenhouse gas CO ₂ emissions (tones/burning 1 tone of substance)	Amount of energy (kWh/1 kg of substance)
Combustion	Coal*	2.76	7
	Natural gas	1.62	14
Nuclear energy		0	24 000 000
Thermonuclear energy		0	60 000 000
Quark-gluon level		0	6 940 387 213 578 000

*1kg of coal = 567 g of ash

4. Global problems and the noospheric balance

The global problems of our time are a combination of social and natural problems, based on which the social progress of humanity and the preservation of civilization depend. These problems are characterized by dynamism, arise as an objective factor of the society development, and for their solution the combined efforts of all mankind are required. Global problems are interrelated; they cover all aspects of human life and concern all countries.

The list of global problems (there are 20 of them, according to the Club of Rome): from asteroid danger and terrorism to 'ozone holes' and thermonuclear war. Among these twenty problems, nine are environmental, often duplicating

each other (for example, ‘catastrophic pollution of the environment’ and simply ‘pollution of the atmosphere’).

Major global environmental challenges are:

1. climate change;
2. pollution of atmospheric air, water and soil;
3. depletion of natural resources;
4. loss of biodiversity;
5. reduction of the Earth’s forest cover;
6. the destruction of the ozone layer;
7. accumulation of waste.

In connection with the Paris Convention, the first issue is on everyone’s lips. It is seen in the increase of air and ocean temperature, the increase of the number of dangerous natural disasters, the melting of glaciers and sea ice, the reducing resources of renewable sources of surface and groundwater in most arid regions.

There are many global challenges, but one of them is now coming to the fore – it is the **catastrophic air pollution** in some areas (Figure 3). As an illustration, let us look at the smog in China (2016-2017):

- In January 2017, smog caused closures of six high-speed tracks and over 180 flights were cancelled.
- Experts say that the safe norms of fine particles concentration in the air are exceeded by 20 times.
- Breathing in Beijing is like smoking 40 cigarettes a day.

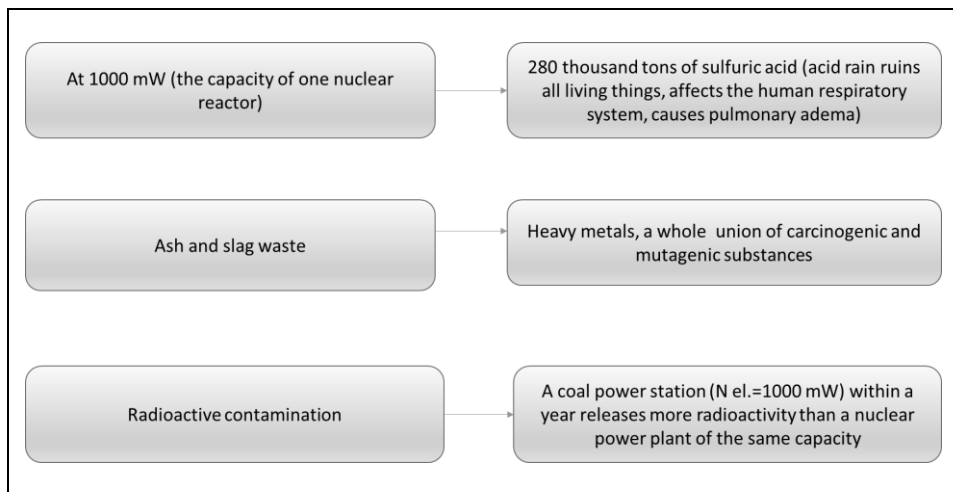


Figure 3. Hazardous emission of coal.

The solution of global problems is completely connected with the noospheric balance. V.I. Vernadsky pointed out that humanity, as a living substance, was inextricably linked with the material and energy processes of a certain geological shell of the Earth – with its biosphere [4]. It cannot be independent of it for a minute. In 1910, V.I. Vernadsky predicted the role of

atomic energy [1, p. 179]. The relationship between mass and energy is shown in Figure 4. The solution of the main problem – energy inexhaustibility – will allow solving three other resource problems of the noospheric balance.

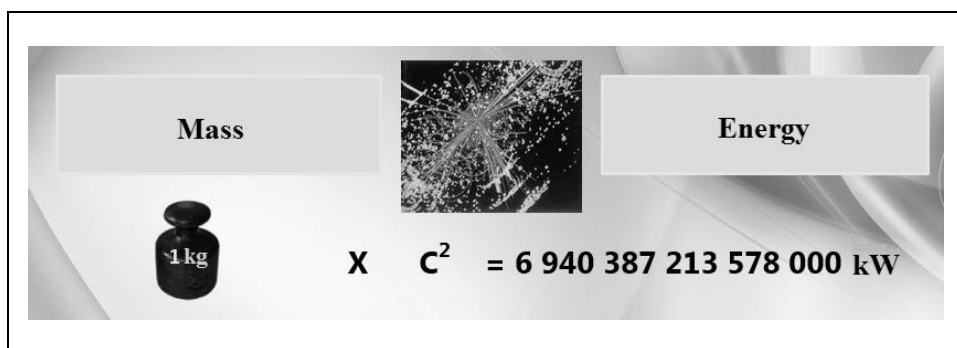


Figure 4. The relationship between mass and energy.

5. Noospheric education

The main thing in the noospheric education is STP in the production and STP in the protection of the environment and ensuring ecological security (Figure 5).

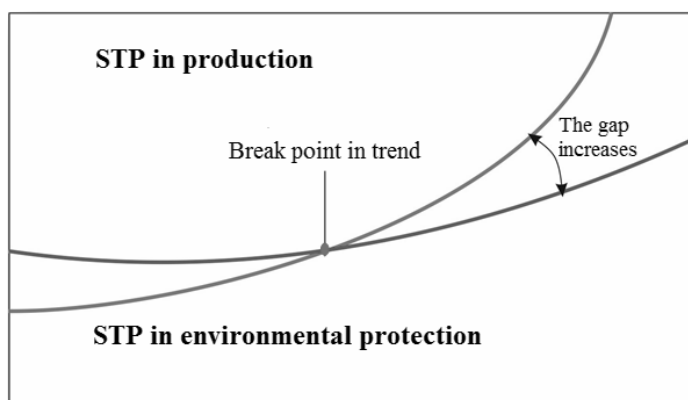


Figure 5. Noospheric balance of STP.

There are pessimistic and optimistic challenges to the possibilities of STP. In 1932, A. Einstein personally asserted: “There is not the slightest indication that nuclear energy will ever be obtainable” [V. Nasasky, New York Times Magazine, September 29, 1996].

In 1932, V.I. Vernadsky wrote: “The phenomena of radioactivity reveal the appearance of a new atomic energy, the importance of which is paramount in the scientific concept, surrounding us reality” [1, p. 179].

Several centuries ago in London the problem was discussed that the development of horse transport would cover the city with a six-meter layer of manure – it did not happen. The car was invented. The British Parliament

expressed its opinion about the electric light bulb: “Edison’s ideas are... unworthy of the attention of practical or scientific men” [5]. The inventions of Edison made another contribution to the scientific and technological revolution.

6. Conclusions

Thanks to technological advances, two main tasks for the survival of mankind are solved: increasing the efficiency of using the planet’s natural resource potential, and using the new forces of Nature for the benefit of mankind.

In 1910, V.I. Vernadsky gave a speech at the meeting of the Academy of Sciences on ‘The tasks of the day in the field of radium’. He said the prophetic words: “... In the matter of radium, no state and society can be indifferent to what way, where and when the sources of radiant energy that they possess will be used and studied. The possession of large reserves of radium gives the owners power and authority, before which the power of the owners of gold, land and capital can fade out... before us, in the phenomena of radioactivity, the sources of atomic energy reveal themselves, and they are millions of times greater than all those sources of power that were drawn in the human imagination” (December 29, 1910). [6, p. 8]

V.I. Vernadsky often raised problems that did not seem relevant in his time. For example, the providence of V.I. Vernadsky on the future role of aluminium was amazing. At that time, aluminium did not have much use. While on the Taman Peninsula, V.I. Vernadsky reported that he had managed to open rich ores of aluminium – bauxite, first found in Russia. He wrote in this connection: “Sooner or later bauxite is to be of a great importance, since aluminium is used (relatively) little due to two reasons of a purely temporary nature: 1. Due to inability to get rid of some small impurities, harmful to its properties – i.e. inability to prepare a completely homogeneous product; 2. Due to the failure to produce its good alloys with other metals. I do really believe in the future of this light and strong metal” (from a letter to N.S. Vernadskaya, July 8, 1899, Temryuk). After several decades, the aluminium industry was greatly developed when the technology of obtaining pure aluminium by electrolysis was developed; and creation of an alloy of aluminium with magnesium (duralumin) initiated the construction of all planes from this, as V.I. Vernadsky predicted, “light and strong metal” [6, p. 8].

Understanding such opportunities as solution of global environmental problems, but in the interests of everyone is very important and allows us to hope that STP, promoted by the MIND, allows us to solve all environmental problems.

The solution of almost any environmental problem is possible through the use of advanced scientific thought, which is the product of the noospheric worldview and the ‘Universal brain’.

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