

## What is Ecology?

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**Annotation:** We live on a very beautiful planet – on the Earth. Our planet has very rich resources: the bright blue of the sky, fresh, crystal-clear mountain lake water, the rich green of the mountains slopes, wild flower, picturesque views – all these sceneries of nature fill us with admiration. That's why those who live in cities prefer spending their days off and their holidays far from the noise of the city, to be closer to nature. Perhaps they like to breathe fresh air or to swim in clear water because the ecology is not so poor as in the cities. Ecology is the study of the ways in which organisms (plants and animals) depend upon each other and upon their surroundings. Each organism requires conditions in order to be able to live and breed. These conditions are its environment by changing the ecological conditions.

**Key words:** ecology, nature, fresh, air, plants animals. environment, future generations, ecosystems, Earth.

Ecology is the study of the relationships between living organisms, including humans, and their physical environment; it seeks to understand the vital connections between plants and animals and the world around them. Ecology also provides information about the benefits of ecosystems and how we can use Earth's resources in ways that leave the environment healthy for future generations.

Ecology is the science of the habitat of living beings and their interaction in the surrounding world of living nature, about how to live every corner of the Earth. and all of their own "home". For modern civilization man 'home' adjacent to the planet together with ical space.

The many specialties within ecology, such as marine, vegetation, and statistical ecology, provide us with information to better understand the world around us. This information also can help us improve our environment, manage our natural resources, and protect human health. The following examples illustrate just a few of the ways that ecological knowledge has positively influenced our lives.

The world that we know cannot be imagined without the Sun, which gives us life-giving light and warmth. The rays of the luminary bring us the first experience of communication with the amazing natural phenomenon of radiation.

The man in the process of life and knowledge of nature discovers and continuously brings in the new world around him by those meters by the sources of light and heat radiation, acquiring

and accumulating experiences with artificial and natural phenomena. In the last century, they have been supplemented by radio waves for communication and navigation, microwaves for cooking, and laser radiation for medicine, science and industry. But more than others, human minds are disturbed by another specific, natural and artificial source, which is given the collective term "radiation".

Radiation is a very general concept, this term means the radiation of a substance. So, pollution is one of the most burning problems of nowadays. Now millions of chimneys, cars, buses, trucks all over the world exhaust fumes and harmful substances into the atmosphere. These poisoned substances pollute everything: air, land, water, birds and animals people. So, it is usually hard to breathe in the large cities where there are lots plants. Everything there is covered with soot and dirt. All these affect harmfully.

Water pollution is very serious, too. Ugly rivers of dirty water polluted with factory waste, poisoned fish are all-round us. And polluted air and poisoned water lead to the end of the civilization. So, nowadays a lot of dead lands and lifeless areas have appeared. Because our actions and dealings can turn the land to a desert.

So, we see that our environment offers an abundance of subject matter for discussion. The problems and prospects of the blue planet interest not only scientist and futurologists, but also politicians, industry, the public – and above all, young people! There is hardly a young person who is not concerned with the preservation of our natural habitat. To recognize environmental problems and master them, to reduce and avoid environmental pollution, to discover and develop ecologically sound technologies – there are the essential building blocks for our future.

Some non-native species (plants, animals, microbes, and fungi not originally from a given area) threaten our forests, croplands, lakes, and other ecosystems. Introduced species, such as the kudzu vine shown here, do this by competing with plants and animals that were originally there, often damaging the environment in the process. For example, the gypsy moth, a native of Europe and Asia, wreaks havoc on great swaths of forest lands by defoliating, or eating the leaves off of trees. At first, highly toxic chemicals, which also poisoned other animals, were the only methods available to control this introduced pest. By targeting vulnerable stages in the moths' life cycle, ecologists devised less toxic approaches to control their numbers.

The Earth is the only planet in the solar system where there is life. If you look down at the Earth from a plane you will see how wonderful our planet is. You will see blue seas and oceans, rivers and lakes, high snow-capped mountains, green forests and fields. For centuries man lived in harmony with nature until industrialization brought human society into conflict with the natural environment. Today, the contradictions between man and nature have acquired a dramatic character. With the development of civilization man's interference in nature has increased. Every year the world's industry pollutes the atmosphere with millions of tons of dust and other harmful substances. The seas and rivers are poisoned with industrial waste, chemical and sewage discharge. People who live in big cities are badly affected by harmful discharge from plants and city transport and by the increasing noise level which is as bad for human health as lack of fresh air and clean water.

Ionizing radiation or ionizing radiation is formed as a result of various X-ray transformations, this is a special type of energy, which is accompanied by the appearance of beta-rays, neutrons, alpha-, gamma-particles.

Ionizing radiation cannot be detected by the human senses, but it can be detected and measured by technical means - detectors - dosimeters based on photographic films. The main quantitative characteristic of ionizing radiation, which determines the level of its effect on biological objects and the possible consequences of this effect, is the radiation dose, the amount of absorbed energy from this radiation.

However, the same absorbed doses of different radiation do not always cause the same biological effects. To take into account these differences, an equivalent dose was introduced, taking into account the peculiarities of the distribution of ionizing radiation in different tissues. In the international system of units, it is called a sievert (Sv). One pollutant = 100 BE r. Common Units equivalent dose BE p 1 BE p =  $10^{-2}$  Sv.

Radiation from various sources:

- water, food, air -135 m BE p / yr
- Potassium -40 -18 m BE p / yr
- Radon -222 -100 mBE r / year
- Lead-210 -12 mBE r / year
- Cosmic rays -37 mBE r / year
- X-ray diagnostics -100 mBE r / year
- Fluoroscopy -900 mBE r / year
- Fluorography -140 mBE r / year
- Watching TV programs - 0.5 -1.0 mBE r / year

Ionizing radiation penetrates into any tissues of the human body depending on the type and energy of radiation to different depths.

Biological actions of single effective doses:

Equivalent dose BE p	Biological action
5-10	Registration of individual mutations.
10-25	For an adult, there are no visible disorders, for an embryo there may be brain damage.
25-50	Temporary male sterilization. Change in blood is possible.
50-100	There must be a change in the blood: impaired immunity.
100-200	Immunodeficiency state.
200-400	Disability, disability.
400-500	Severe damage to the bone marrow, 50% mortality.
600-1000	Severe damage to the intestinal mucosa, 100% mortality within 3-12 days.
1000-10000	Coma: death in 1-2 days
> 10000	Death over the beam.

A simple sheet of paper is sufficient to protect alpha radiation. Effective protection from beta particles will be provided by an aluminum plate with a thickness of at least 6 mm. the highest penetrating power is possessed by gamma radiation. To protect against it, a shield made of lead plates or thick concrete slabs is required.

Nuclear power plants (AES) are one of the artificial sources of ionizing radiation.

Ecology is considered to be the interdisciplinary scientific study of the organisms' relations and their interactions with the environment. It is closely related to the disciplines of physiology, evolution and genetics.

Modern ecology is rather young science, which first attracted formal attention at the end of the 19<sup>th</sup> century. And after the information explosion concerning an ecological crisis of our planet, ecology attracted the interest of researchers all over the world and became very popular during the 1960s environmental movement.

One must understand that the problems ecology is engaged in are immense. Some of the most important ecological questions are: soil, atmosphere, radiation from the sun, water, and living organisms. One can't help noticing that nowadays ecologists research everything from tiny bacteria's role in recycling to the effects of tropical rain forest on the Earth's atmosphere.

At least two techniques are used to study Ecology; one of the methods is testing a hypothesis by means of experiments and the other is defined as a "common sense" approach.

There are many subcategories of Ecology. Animal and Plant Ecology looks at the differences and similarities of various animals and plants in differing climates and environments. Physiological Ecology, or ecophysiology, studies the responses of the individual organism to the environment. Population Ecology studies the similarities and dissimilarities of populations and how they replaced each other over time. The last subcategory is Ecosystem Ecology. Ecosystems refer the physical and biological relations among organisms and their interaction with every other element in their local environment.

If we take into account, that the Earth formed approximately 4.5 billion years ago, one can't help noting that throughout its history, the Earth's atmosphere and biogeochemical cycles have been in a dynamic equilibrium with planetary ecosystems which, in its turn, are coupled to human environments. And although the ecological problems are now being recognized all over the world people themselves are placing too much stress on the ecology of the planet. Researchers report that, if nothing be done to prevent the environmental catastrophe, by the mid 2050s human civilization will have exceeded the bio-regenerative capacity of the planet. That is, it means that if natural resources are being extracted with the present day rate, ecosystems all around the world won't be able to recover themselves.

Before power on other types of nuclear fuel have significant environmental benefits They keep living spaces for us, while around coal power plants hundreds of hectares occupied by ash dumps harmful coal dust, hydroelectric flooding by reservoirs fertile meadows, and wind turbines, occupying extensive ultrasound Square scare away for kilometers all alive around. NPP during operation does not increase the radioactive background in comparison with the natural one. Ash dumps of coal plants create a radiation background 5-4 0 times higher than emissions from nuclear power plants.

In the area of nuclear power plants is lower than in the area of TPP average annual individual doses Nuclear power is not implicated in acid rain, the most valuable because they do not burn fossil fuels, nuclear power plants are not "eats" oxygen and does not pollute the atmosphere with toxic emissions and and does not alter the chemical composition of the air.

Of all these factors, the most important for a nuclear power plant and distinguishing it from a thermal one is radiation. During the production of electricity at nuclear power plants, radioactive substances are generated, the release of which into the environment can lead to dangerous consequences for humans. Therefore, it is necessary to be able to completely eliminate the radiation impact on plant workers, population and the environment. When designing the plant, safety barriers are envisaged to prevent radioactive releases into the environment.

To reliably detect the appearance of radioactive substances in the environment along the possible path of their spread, create five control and measuring barriers. It:

1. By warning light air ejection through the main vent pipe;
2. Control on the territory of the station;
3. Control of water discharges;
4. Control in the sanitary protection zone (within a radius of 3 km from the NPP)
5. Control in a 30-kilometer observation area.

The operational radiation situation is continuously monitored by control systems inside the station and an automatic system for monitoring the radiation situation in the observation area.

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