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Environmental Problems of Solid Waste at the Present Stage

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Abstract

This article is devoted to the problem of solid waste as one of the most undesirable negative factors at the present stage. The environmental problems of solid waste at the present stage are considered in the context of water and food poisoning, environmental pollution, which poses a great threat to society, and will also negatively affect the health of the population. A comparative analysis of the causes of environmental problems of solid waste in the modern world is given.

Keywords: Solid waste, environmental risks, environmental initiatives, toxic substances and compounds, organic pathogens, waste recycling, waste minimization.

Introduction

As is known, one of the dangers threatening modern civilization and humanity is environmental disasters with its many components, including problems associated with solid municipal waste (MSW). At the present stage of human development, humanity has faced, perhaps, the most pressing problem - how to preserve nature and civilization, since no one knows when and in what form this or that catastrophe may occur.

According to environmentalists, smokers leave a huge amount of waste. Cigarette butts are not biodegradable, since they consist of acetate cellulose. When they get into water, they release toxins, poisoning plankton organisms and fish. 150 years ago, waste consisted mainly of natural products - paper, wood, food, wool and cotton. They decomposed without much harm to the environment, but over time, the garbage became more and more toxic. The content of heavy metals, radioactive substances and plastics based on synthetic resins increased. Modern garbage heaps are very toxic and continue to harm the environment and public health even after they are eliminated.

LITERARY RESEARCH

According to experts, environmental protection issues arise in the context of increased production. The problem of the relationship between man and nature has always been of particular importance. Back in the 20th century, humanity realized that disruption of the biosphere and its processes could lead to a planetary catastrophe.

According to World Bank estimates, 2.01 billion tons of municipal solid waste (MSW) are generated annually in the world, and at least a third of it is not disposed of in an environmentally safe manner. Globally, the amount of waste generated per person per day averages 0.74 kg, but varies widely - from 0.11 to 4.54 kg. High-income countries, which account for only 16% of the world's population, produce about 34% or 683 billion tons of global waste.

The materials [1] note that it is not the first generation in a row that humanity has lived with a constant and obsessive fear of environmental disasters. Deforestation, ocean pollution, destruction of the ozone layer - we have heard these phrases in our lives hundreds, if not thousands of times. But where does the real threat lie, and where is sheer speculation. Man has interacted with and influenced the environment around him since the very moment of the emergence of his species. However, this influence reached a truly tangible scale only in the eighteenth century, with the beginning of the industrial revolution. At that moment, man left the natural cycle of living nature and began to dictate his own rules to the planet. The planet began to change, but we noticed this far from immediately - our civilization was busy with other things: the extraction of fuel (coal, gas, shale, oil), metal and other minerals. All these substances, naturally derived by nature and removed by man, returned to nature, but in a different form. This resulted in global pollution of soil, water and air and became the cause of an ecological crisis. And the intensity of this process continues to grow at a catastrophic rate, and humanity will have to eliminate the serious consequences of the ecological crisis in the near future.

According to the website [2], by 2050 the volume of waste in the world will grow to 3.4 billion tons, which is more than twice the population growth over the same period. This may be due to the growth of wealth, consumption, and the middle class. As is known, the fastest growth of the middle class, consumption, and the associated growth of MSW in absolute terms are observed in China and India. In this regard, it may be interesting to look at the practice of MSW management in China. The website also notes that in China, environmental pollution due to excessive MSW formation is one of the country's main problems, because the scale of urbanization has increased from 17.9% in 1978 to 51.3% in 2011, putting environmental pressure on urban areas. During this period, the amount of waste has increased sharply with an annual growth rate exceeding 10%. The increase in the volume and complexity of waste creates serious risks for the environment and public health. Currently, the annual growth of MSW formation is estimated at approximately 8-10%. MSWM is restructuring the waste sector using Industry 4.0 technologies. This aims to move towards a circular economy (CE) as a whole, not just solving MSW problems. It is obvious that digitalization is a driving force for China to move towards low-carbon development strategies under the CE. Through digitalization, the waste sector has promoted the prevention, reduction, reuse and recycling of waste (the three principles of the circular economy) before it is dumped in landfills. The proper implementation of waste recycling based on digitalization has promoted effective cooperation between the public and private sectors, expanded employment opportunities and contributed to the conservation of resources, while ensuring the transparency and traceability of the sector.

As the source [3] puts it, “Nothing disappears, everything is transformed.” This old aphorism is very relevant today, as world leaders and local communities increasingly call for a solution to the so-called “throwaway culture.” But it is not just about individuals and households: the problem of waste is much broader, affecting people’s health and income, the environment and well-being.

Solid waste management is a global problem that affects everyone on our planet. And since in low-income countries over 90% of waste is dumped or incinerated, the poor and vulnerable suffer the most.

The website [4] notes that the growth in waste generation is alarming. Rapidly developing countries lack adequate systems for managing solid municipal waste, the composition of which is changing. The pace of global waste management is set by major cities, where more than half of the world's population lives and over 80% of global GDP is generated. According to the World Bank's Waste 2.0 report, the world generates 2.1 billion tonnes of municipal solid waste each year, with approximately 30-40% of that waste not recycled in an environmentally friendly manner. The 2018 report, an update of its previous edition, predicts that by 2050, driven by rapid urbanization, population growth, and economic development, the volume of waste generated worldwide will nearly double to a staggering 3.76 billion tonnes per year.

According to the author L. Ostapenko [5], 20 million people live in the capital of Nigeria – Lagos. In addition, a number of European countries, not having their own waste processing plants, have been using the suburbs and the capital of this African state as a large landfill for many years. Nigeria is an industrial country – coal, oil and other minerals are mined here; industrial waste is not disposed of, but simply stored, the air in the cities is polluted. That is why the problem of garbage is extremely acute for the residents of Lagos and the surrounding cities, because the landfills are expanding due to their own industrial waste. Of course, a number of environmental initiatives have been adopted recently – for example, recycling waste into electricity or mobile waste disposal on bicycles. But in this case, solving environmental problems is impossible without solving political and social problems. Most of the country's population lives below the poverty line, constant armed conflicts contribute to the impoverishment of the provinces and the mass migration of people to the cities.

It should be noted that it cannot be said that the world is inactive. Certain shifts are noticeable. Waste sorting containers have appeared. In some European countries, methane is pumped out of landfills. Such steps allow us to hope for a solution to the problem, but, alas, not in the near future.

Methodology

If earlier the problem of garbage was considered purely urban, now we see that many territories in all countries are littered with garbage. We find it in the forest and in the meadow and in the river valleys. Polyethylene, tin cans have disfigured the nearest areas of the forest. But the forest has an irreplaceable value not only as a building material, but also as a vital component of the human habitat. Today, hardly anyone would want to walk in such a forest. At the present stage, most people do not see the degree of seriousness of the problems associated with solid waste and municipal solid waste. They do not understand and do not want to understand that this waste will return to each of them on the site in the form of contaminated groundwater, toxic dust. The water will be unfit for drinking, vegetables and berries will be poisoned and unfit for consumption. The environmental problems of the world as a whole and the environmental problems in all populated areas pose a great threat to society, that is, they are relevant today.

The issue of all kinds of waste has been considered since the emergence of human population. This problem was given due attention even in the Middle Ages. It is known that there were laws prohibiting the pouring of sewage into the street. But in those years the issue was not so acute,

because the garbage was of organic origin. It decomposed quickly and did not have a strong impact on the environment.

Solid waste is one of the main types of pollution problems on the planet, which poses a potential health hazard to people living in all countries of the world, as well as a danger to the natural environment. In many countries, there is still a problem of misunderstanding the seriousness of the solid waste problem, and therefore, there are no strict regulations, as well as the necessary legal acts governing issues related to waste and garbage.

At the present stage, environmental problems of waste include pollution of soil, water and air, as well as harm to the ecosystem. Some of them are:

• Greenhouse effect. Gases formed in landfills lead to global warming, which threatens the extinction of many animal species and the flooding of large areas of land.

• Pollution of the World Ocean. As a result of dumping garbage from coastal zones of continents and from ocean liners, garbage patches are formed on the surface of the ocean. They destroy animals and birds, poison water and soil.

• Long period of decomposition of inorganic waste. Some elements have been present on the earth for over a thousand years. They accumulate, pollute the world's oceans and kill rare species of animals.

• Spontaneous combustion of garbage. The gas emitted by garbage can cause fires.

• Reduction in the number of insects and animals. Glass, iron and other objects injure inhabitants of forests and fields.

Unsustainable waste management has led to a number of environmental problems across the planet. Modern societies have significantly increased the amount of waste that is constantly being generated due to the relentless pace of production and packaging processes, which in turn is due to the rapid growth of the population and the need to serve it. To reduce the amount of waste generated, governments, businesses and individuals are encouraged to recycle existing products and use recycled materials. This minimizes the amount of waste that must be assimilated and reduces the need to extract minerals and other resources to produce new products.

The seriousness of the waste problem was not so noticeable before. Nature managed to process waste itself until a certain time, but the technical progress of mankind played an important role in this moment. New materials appeared, the decomposition or processing of which in a natural way can last for several hundred years, and nature is no longer able to withstand such anthropogenic loads. Yes, and an important factor is the current volume of waste produced. It is simply enormous. But today waste and garbage can be considered as raw materials. They can be recycled and reused. Each city dweller produces approximately 500 to 800 kg of waste per year. In some countries, up to 1000 kg. And this number is constantly growing.

Waste generation in societies with the lowest income levels is low, but then increases rapidly due to increased consumption at a low income level than in societies with a high income level. It is expected that by 2050 the total amount of waste generated in low-income countries will more than triple. East Asia and the Pacific generate the largest share of global waste at 23%, while the Middle East and North Africa region produces the least in absolute terms at 6%. However, the fastest growing regions are Africa, South Asia, and the Middle East, where total waste generation could increase 2-3 times by 2050. These regions currently openly dump more than half of their waste,

and the increasing trends in waste will have serious consequences for the environment, health, and well-being, requiring urgent action.

The environmental problem of waste is an international problem. It exists in all countries, but each nation approaches its solution in its own way. Some are less successful, while others are more effective. There are several main points of application in solving the problem of waste. Storing waste in places not intended for this is a serious threat to the environment, because:

1. Due to the release of toxic substances that are part of some types of solid waste, the soil is polluted.
2. Chemical reactions occur between the various components of household waste, leading to the formation of toxic compounds that then poison the air.
3. Wastewater from landfills, which contain toxins, organic pathogens, and heavy metals, pollutes groundwater during rains.

How much harm will be done to nature by one spontaneous landfill depends on the amount of solid waste left there, its composition, as well as the climatic features of the region. But in any case, understanding the dangers of garbage, environmentalists believe that the problem requires an immediate solution, because even organic food waste decomposes in at least thirty days. As for plastic and metals, the process of decomposition of such waste will take from several dozen to several hundred years.

Unfortunately, an optimal method of waste disposal that does not have a negative impact on the environment has not yet been invented. Most often, waste is buried in special burial grounds or burned. The first method leads to groundwater pollution, the second - to emissions into the atmosphere when the temperature rises. It is quite possible that methane will form, which often leads to spontaneous combustion of unnecessary remains (especially in open areas).

The problem of waste recycling exists in many countries. Not every country can afford a plant that would deal with waste recycling. This expensive enterprise does not always pay off. In terms of preventing an environmental disaster, waste recycling is the most effective way to get rid of waste. According to experts, in order to solve the waste problem, it is necessary to implement programs to minimize waste, sort waste, and create enterprises for its recycling. It is also important to improve the culture of consumption and the level of responsibility of the population.

Conclusions

Based on the above, we can state that solid waste really pollutes nature and causes great harm to humans and other living organisms. The more people join in solving the environmental problem, the more benefit there will be to society. I believe that if we want to live in an ecologically safe country, breathe fresh air, drink clean water, then both the authorities and residents of populated areas need to change their attitude to solid waste.

In conclusion, I would like to note that the destructive consequences of industrialization in all regions and countries of the world have forced humanity to take urgent measures to eradicate the problem of solid waste at the present stage. It follows that the environmental problems of solid waste have revealed two versions of the development of events. Either humanity must look for another way of relating to nature management, or it will exist in its own waste.

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