

## **IMPACT OF BIOMEDICAL WASTE MANAGEMENT ON MARINE ECOSYSTEM**

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Since ancient times, marine ecosystem has been an essential part of human life. 70 percent of the earth is covered by water. We humans are dependent on marine ecosystems for our earnings, food, energy, and water. Even so, there are many industries based on the marine ecosystem. With increase of human activity in marine ecosystems, marine life is disturbed. Many negative changes have been seen in the marine ecosystem, like the acidification of ocean water, the raising of its temperature, the presence of plastic particles in the water, etc. All these problems have increased due to increased population and unregulated human involvement in the marine ecosystem, whether directly or indirectly.

In 2015, to solve the issues related to marine ecosystems and many other issues related to human health an environment, the United Nations developed 17 Sustainable Development Goals (SDGs), which are to be achieved by 2030. Every goal has its importance, and almost every goal is interconnected with each other. One of these goals is SDGs 14, which is related to life underwater; SDGs 3, which is related to good health and wealth; SDGs 6, which is related to clean water and sanitation; and SDGs 9, which is related to industry, innovation, and infrastructure.

The effects of pandemics on humans are well known. It was one of the saddest disasters of the 21st century, caused by the nature of human beings, which reminds us of the Malthusian theory of population. The theory was propounded by Thomas Robert Malthus, an influential British economist. He was famous for his theory on population growth, outlined in his 1798 book *An Essay on the Principle of Population*. It was he who mentioned in his theory that if we failed to check our population, the environment would do so through famines, earthquakes, floods, and epidemics. In the last few decades, we have faced many tsunamis and earthquakes worldwide. Very recently, there was a major earthquake in Turkey and Syria. A pandemic is one such check by nature, where uncountable deaths have been recorded worldwide. Even now, we are facing these issues. Though the pandemic proved to be a bane for human life, in many ways it was a boon for the environment (biotic and abiotic), animals, birds, rivers, etc. It was during the lockdown phase that the ozone layers healed. But on the other side, we have seen how the increasing use of biomedical articles has

increased the pollution of rivers and ocean waters. Several studies have revealed that the rise in medical waste during the pandemic was another cause of contamination in the marine environment in addition to the previous issues. Every year, about 350 billion face masks are used in Asia and Europe, and more than 25,000 metric tonnes of plastic garbage related to the epidemic, including medical waste from hospitals and personal protective equipment, are discarded into the ocean. Even the wastes connected to the epidemic, like used gloves and face masks, are sources of microplastics, which are very harmful to marine animals and human health as well.

During this pandemic, one can understand why the UNDP goal of SDGs 14 cannot be achieved without achieving SDGs 3, 6, and 9. All these goals are interconnected. With the increase in population, the number of hospitals and pharmaceutical companies has increased, as has the amount of biomedical waste. Though every country has rules and regulations related to bio-medical waste management, during this pandemic, it was seen that we had failed to manage bio-medical waste, which is very harmful to human life as well as the environment. It has raised questions among us about whether we have sufficient tools and means to check biomedical waste. Research studies have shown that the increased usage of bio-medical products in recent years has worsened the scenario for the marine ecosystem. It has been found that many of the user's face masks and other bio-medical products were dumped in the rivers, which increased plastic particles in the water. Control of plastic in waters was already an issue, which was worsened due to the pandemic. It's not only harmful to aquatic life, but also human health, as it contaminates water, making it un-portable. Laws aren't sufficient to deal with these issues. Research need be done at the management level. Bio-medical waste should be managed in a way that least amount of waste is generated, and that waste be disposed of properly, so that environment and human life, should not be affected.

No doubt for maintenance of public health, hospitals, and pharmacy companies are important. SDGs 3 and 9 are related to good health and industry, innovation, and infrastructure. To achieve these goals, everyone must first try to check on the growing population. SDGs 3 and 9 are related to good health and industry, innovation, and infrastructure. Companies are important for the economic growth of countries, but at the same time, they have a responsibility for maintaining the environment. Many principles have already been developed for controlling the pollution caused by industries, but the issues remain the same. SDGs 3 and

9 are related to good health and industry, innovation, and infrastructure. To achieve these goals, everyone must first try to check on the growing population, because that is the root cause of every issue. Industries need to use eco-friendly materials, it is equally important for the government and industry to check or suggest the proper disposal of the waste generated from bio-medical products. The sustainability of SDGs 14 is possible to achieve only when we generate less waste with proper disposal systems, and at the same time we have to control our population, or else nature will check it on its own.

