

## ROLE OF TECHNOLOGY IN SUSTAINABLE DEVELOPMENT

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### ABSTRACT

Nowadays, entire world is marching towards all types of progress and development. In the name of progress we are exploiting the natural resources to the considerable extent. The main reasons for environmental degradation is different kinds of human activities adversely affecting on the entire survivors on the earth. To overcome the situation new principle is devised i.e. sustainable development. This paper discusses the impact of environmental degradation and the technological plans undertaken to mitigate the long term effects of developmental and environmental degradation.

**Keywords:** Sustainable development, Degradation, Legislation, Pollution, Technology

### Introductions

Today, environmental degradation has become a vital issue. Environmental deprivation is one of the largest threats affecting the entire world. This is because of the exhaustion of significant resources such as air, water and soil; the destruction of ecosystems, habitat, wildlife etc. If the situation is continued it will be highly dangerous to the entire world. Most of the countries are taking some positive steps- legal, administrative, and technological measure and adopting some new environmental principles like precautionary principle, polluter pays principle, sustainable development etc. I will analyze here the role played by the legal and technological measures in the sustainable development of the environment and the society.

### Meaning and Rational of Sustainable Development

Sustainable development is a way of life that we need to preserve natural resources for the survivorship of future generation. Therefore we should maintain the balance in the ecosystems. There is an International principle 'fulfill the human development goals without limiting capability of fulfilling needs of future generations'. Every socially responsible person must use natural resources very wisely which are in deplorable situation. Consequently, some civilized societies are now actively adopting sustainable products and technologies. The principle allows the use of resources without disturbing balance and stability of the natural system. It refers to the balance among environmental, economic, and socio-cultural three dimensions to guarantee its long-term sustainability. It has been defined as-

*"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs."*<sup>1</sup>

It is the Global Goals to take action to end the poverty, protect the earth and ensure all people to enjoy the equality, peace and prosperity.<sup>2</sup>

### Objectives of Sustainable Development

1. To manage the national development involving an industrial and economic and that will be sustainable and growing in the right direction.
2. The principle will achieve the conservation, protection and enhancement of the existing environment.
3. The emphasis of principle is to provide the basic facilities like health and hygiene to future generations and vibrant global communities.

### Importance of Sustainable Development

The importance of sustainable development is measured with respect to ecology, development, exploitation and the awareness of the people.

- 1) A tool available to work judiciously towards maintaining the ecological balance.
- 2) A formula for the industrialists' to minimize and reduces degradation.
- 3) An indicator to prevent the over exploitation of the natural resources.

- 4) A principle imbibing awareness in the students and community members regarding preservation and conservation of the environment.

**Role of Technology**

On one hand the technology is used to shape the society, economy and environment and on other hand technology has caused many social, economic and environmental issues. However, it is also a key to resolve environmental degradation, climate change, waste management and other global challenges. To fight against global environmental issues the technology will play a vital role. This is for balanced development of the public, industry and agricultural sectors.<sup>3</sup>

**Technology in agriculture sector-**

The technology used in agriculture sector to support its usefulness and safety. It can be applied in diverse aspects like the herbicide, fertilizer, pesticide and improved seed. Presently farmers are growing crops in places where they were felt impossible and difficult. Biotechnology is a technique used to introduce certain new strains into other genes of crops or animals which resists to disease and drought. Advanced production of crop varieties naturally resistant to pests will permit a further reduction in toxic chemicals used as pesticides.

**Water treatment technology-**

The public health is the basic feature of urban water distribution system; water transportation and treatment techniques must be chosen accordingly. Now technologies are developing to control many types of pollutants, organic micropollutants and heavy metals. Agro irrigation technologies will minimize water consumption and prevent redundant groundwater extraction. The great environmental disasters like Exxon-Valdez<sup>4</sup> and the Prestige<sup>5</sup> were the catalyst for scientists to implement new technologies for cleaning oil-contaminated environments.

**Foodstuffs-**

An increasing global population demands more food production. The storage and distribution of foodstuffs requires improved technological advances. Also marine and freshwater seafood in aquaculture can lead to increased production. The food industry is continuously moving away from traditional methods of processing, food packaging, and distribution to adopt technology, the world robots, sensors, and kiosks. It becoming more innovative and environmentally sustainable.<sup>6</sup>

**Mining-**

The industries extracting minerals are adopting environmentally sound practices, developing approaches and technologies to remedies past environmental damage. Also technologies are increasingly applying to rehabilitate degraded landscapes.

**Infrastructure-**

The efficient functioning of society requires public infrastructures to achieve sustainable development. It includes water dam, power systems, bridges, roads, communications and transport facilities. The scientists and researchers are always engaged to innovate and design new materials based on a better understanding. Traditional materials, such as steel, concrete, and plastic are undergoing significant revolutionary changes that reduce the environmental crash. These new materials are more energy efficient that consume less mineral resources for their manufacture. These alloys are recyclable, lighter than aluminum, stronger than steel and are superior to other materials.

**Automobile-**

Today 50 % air pollution in the world is caused due to vehicular traffic. To tone down this situation the researcher are trying to develop technologies to minimize environmental pollution. The remedies invented like electric cars and biofuels and solar energy which will play a positive role. The vehicle versions like 'green cars', 'hybrid vehicles' etc that consumes less fuel to travel the same distance. Since, in the United States alone, car, bus, motorcycle and truck trips cover an annual distance equivalent to making 13,440 round-trips to the sun.<sup>7</sup> Therefore they are seeking alternatives to conventional vehicles, in order to reduce consumption of oil and fossil fuels. The use of renewable energy is an alternative to traditional fuels. For ex- biofuels generated from biomass of living organisms or their metabolic waste. Also in future world energy should be efficient solar power generation; biomass, windmill and nuclear power plants signify an indispensable resource for energy supply, use and distribution of energy.

**Biotechnology-**

The 'living' technology will be crucial in promoting sustainable development. The bioremediation technology uses the microorganisms, bacteria or fungi to decontaminate waste water from public places. In order to ensure sustainability innovation in a new biomaterials use and store carbon dioxide that help to reduce the greenhouse effects and global warming. The use of biotechnology to produce bio-fuel is a solution for environmental protection.

**Information Technology-**

The surprising technological revolution now started is the information technology. It has the potential to report location of people work and live and the nature of the future urban areas. Networks of fiber optic cables systems and earth-orbiting satellites are enhancing our ability to protect the environment. These techniques allow real-time monitoring of environmental situations. Information technologies allow precise control over industrial processes, automobiles, nuclear power plants, chemical processing, mineral extraction which improves our ability to minimize pollution.

**Manufacturing-**

Manufacturers have begun use various technologies to reduce, re-use, and recycle materials and products to maintain the industrial ecosystems. According to this concept, wastes from one part of the system are to be transformed to other parts of the system. Companies have begun to change product and process design in ways that minimize the cost and increase the quality of products including the environmental balance and worker safety. This technique also uses to renewable agricultural and expanding forestry resources.

**Conclusion**

In the name development the scientific and technical innovation will be critical to saving the environment, reducing the impact of global warming, climate change, and taking care of our own health. The science and technology will be better prepared to meet the challenges of the future. Environmentally sound technologies are from a life cycle perspective and protect the environment, less polluting, use resources in a sustainable manner, recycle wastes and handle all residual wastes in a more environmentally acceptable way that is by way of sustainable development.

**References**

<sup>1</sup> *Environmental Law by Leelakrushanan, 2021*

<sup>2</sup> *Goal adopted by the United Nations in 2015*

<sup>3</sup> *Paris Climate Change Conference, December 2015*

<sup>4</sup> *On March 24, 1989 the Exxon Valdez oil tanker was loaded with 54 million gallons oil struck the Bligh Reef in Alaska and released 1.8 million gallons of oil were released into the water, considered to be II major oil spill.*

<sup>5</sup> *A 26 years old structurally deficient vessel 'Prestige' spilled 60,000 tones oil at the coast of Galicia, Spain in November, 2002.*

<sup>6</sup> *SIAL America Events for the Latest Trends in Food Science and Technology, <https://sialamerica.com/>*

<sup>7</sup> *The US Environmental Protection Agency*

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