

The Necessity of Sustainable Development and Climate Systems to Protect Natural Resources and Human Race

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Abstract – Sustainable development ensures a well-managed utilization of natural resources for the present generation along with preserving it for future usage. Increased rate of population and urbanization is found as major challenging factors in respect of practicing sustainable development activities. Both aforementioned problems are also prevalent in India that disrupts the attainment of Sustainable Development Goals. However, the Government of India has taken suitable initiatives to promote utilization of renewable energy resources by means of International Solar Alliance, Green India Mission, and others. Technological inclusion in this regard would be beneficial in implementing such programmes in an optimum way. Consequently it would ensure preservation of natural assets for future usage and maintain the quality of climatic conditions in a suitable way.

Keywords— *Sustainable development, climatic conduction, natural resources, human civilization*

Introduction

Sustainable development includes a standard management of human usage of natural resources to keep a balance between economic progress and environmental protection. It ensures meeting of all the needs made by the present generation along with protecting natural assets for the usage of future civilization. However, it is evident that natural resources are severely affected by uncontrolled human activities for development purposes. In a developing nation like India such a problem is emerging due to overexploitation of natural elements. It results in increased pollution, climate change and harm to both biotic and abiotic components. Thus, it is an urgent need to proceed towards environment friendly development activities for ensuring safe and prolonged survival of human civilization.

A well-diversified natural resource is found in India that includes water resources, minerals, forestry, and biotic elements. On the other hand, population bursts and unrestrained industrial activities and urbanization results in shrinkage of those natural elements across the country. It is estimated that the country's population will reach 1.5 billion within 2030 (Ritchie *et al.* 2018). Such rapid growth in population leads to increasing demand for all the elements required for survival. On the contrary conventional energy resources such as fossil fuels, coal and others are limited and would not be used for a prolonged period. Emphasis on renewable energy resources is significant in this regard to protect the biodiversity of the natural ecosystem along with meeting fundamental needs of the population. In India several programs are launched by the present government to practice development activities in a sustainable manner. These are *National solar mission, National water mission, National mission for sustainable agriculture, National mission for enhanced energy efficiency* and others (Santosh Vani *et al.* 2017). More environmental science is also incorporated at all levels of education to make the present generation aware about the need of sustainable practices to protect natural resources for future utilisation.

Importance of sustainable development

The world population is increasing at a rapid pace and consequently the demand for natural resources is also elevating in recent periods. An unplanned usage of natural elements results in environmental degradation, waste generation and increased pollution. Global warming, depletion of ozone layer, erratic precipitation, desertification of farmland, extinction of living species are instances in this regard (Verma, 2018). This disruption results in an ecological imbalance and affects the natural cycle of material flow between abiotic and biotic environments. Climatic change leads to abrupt elevation in temperature, irregular rainfall, earthquakes, flash floods, shrinkage of glaciers and increased sea levels globally. Therefore, sustainable

development is necessary to retain the ecological balance in nature for ensuring stable existence of all the biotic elements (flora and fauna) essential for human existence in future. Adverse consequences of unsustainable activities are as follows:

- Salination of agricultural lands
- Destruction of vegetation
- Loss in biodiversity
- Genetic erosion
- Climate change
- Insufficient availability of freshwater resources
- Depletion of aquifers

It is evident that 36% of the biosphere is covered by humans and 37% of it is disturbed by uncontrolled human activities (Ramesh *et al.* 2019). On the contrary 20% of the global population live in poverty due to discriminatory development (Wietzke, 2020). Therefore, development activities are required to be conducted for poverty alleviation along with keeping the natural ecological activity undisturbed. Planned urbanization is a remedial action on that note to protect the land area unaffected and can be used for agricultural activities. Usage of natural fertilizers is significant to maintain the quality of soil intact along with preventing it from depletion. Apart from those following activities are also included in sustainable development practices:

- Tree plantation and protection for existing forestry assets
- Emphasising on renewable sources of energy such as water, wind, solar, biomass
- Conducting industrial activities by focusing on recycle, reuse, and reduce
- Implementation of eco-friendly technologies for ensuring resource efficiency and minimizing waste generation

Two major factors are associated with sustainable business activities that ensures establishment of equity with the utilisation of natural resources by present generations. The first category is termed as *inter-generational equity* that ensures preservation of natural assets for the future generation (Thomson *et al.* 2018). It can be attained by elimination of over exploiting natural resources, reduction of waste production, lowering the rate of emission and maintaining ecological balance. Another way to maintain equality of natural resource utilisation is termed as *intra-generational equity* (Talukder and Hipel, 2020). It emphasizes on equal distribution of natural wealth among the present generation through technological advancements for reducing the development gap and sustainable economic growth globally.

Certain factors are also involved with measuring the rate of sustainable development such as optimum resource utilization, improvement of socio-economic framework and promoting environmental awareness. Optimum level of resource utilization is dependent on the carrying capacity of any biological system (Lamb and Steinberger, 2017). As human beings utilize natural elements in an extensive manner to ensure the utmost level of development, overexploitation of natural resources is happening that leads to surpassing the carrying capacity of the environment. Consequently, a severe amount of degradation occurs that crosses both the supporting and assimilative capacity of the ecosystem (Cheng *et al.* 2019). Therefore, it is required to ensure sustainable practices by utilising appropriate technologies to limit the consumption of natural resources optimally that would not affect the regeneration capacity and tolerance limit of the environment.

Sustainable development challenges for human civilization

Population growth and urbanization are two major challenging factors for attaining sustainable development in an optimum way. It leads to excessive demand for energy resources, increased rate of waste generation and subsequent increase in pollution. Moreover, inadequacies of natural assets are also generated that affect the natural ecosystem and disrupt the smooth growth in development. The aforementioned factors hindering sustainable development activities are discussed below:

Population growth

It is a global challenge that is estimated to be unaffordable with the limited sources of natural resources globally. Global population is estimated to reach over 11 billion within the upcoming 50 years and it is a major concern in respect of sustainable development activities globally. As per the report of the United Nations global population would reach up to 10.3 billion in 2050 by an annual increment of 80 million people in developing nations (Manthey *et al.* 2019). It results in disrupting the ecological balance by increasing urbanization, industrial activities, agricultural practices and destruction of natural assets to accommodate such population elevation globally. In India it is estimated to have a population growth of 1.61 billion in 2047 (Koshy, 2020). Therefore, suitable programmes (Five Years Plan) are promoted by the government to reduce such uncontrolled population growth. Along with that, women's education is also promoted to make the society aware about the adverse impact of population on meeting sustainable development goals (SDGs).

Urbanization

Global urban population is estimated to increase by 2.1 billion by 2030 that would fasten the climate change in an adverse manner. According to the World Bank, 40.76% of the Indian population will reside in urban areas in 2030 (World Bank Group, 2021). Such an elevation results in several adverse impacts on the climate such as increasing environment temperature, reduction in air quality, water run-off, changing weather patterns, deforestation, loss of farmland, water scarcity and others.

Apart from that, more energy consumption is another major concern in this regard. Therefore, such growth is required to be controlled for ensuring optimal usage of natural assets and lowering the environmental impact.

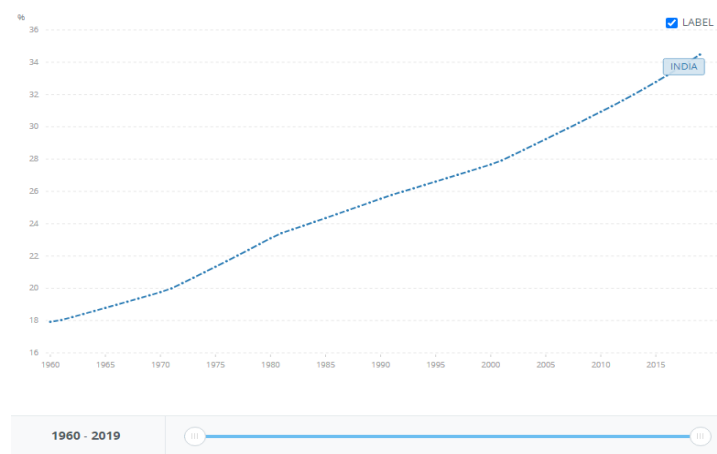


Figure 1: Urban population growth in India

(Source: World Bank Group, 2021)

Apart from the above mentioned factors certain related activities also disrupt the attainment of sustainable development goals. Inadequate waste management is one of them that results in increased accumulation of solid, liquid and gaseous waste materials that ultimately affect the climatic condition. Hence, technology based approaches such as recycling of waste materials, utilisation of renewable energy sources and energy recovery are essential in this regard to reduce the pollution level. According to the Central Pollution Control Board of India a total of 48 million tonnes of municipal waste is generated annually in urban areas (Sharma *et al.* 2019). Thus, it disrupts the natural ecology adversely and damages climate parameters. In addition an unprecedented growth in energy usage is also found globally those results in global warming. India accounts for half of the elevation in residential energy consumption that produces greenhouse gases by burning fossil fuels (Vetter *et al.* 2017). However, presently suitable initiatives are implemented by the present government to focus on alternative sources of energy (solar) for reducing the rate of pollution.

Sustainable development and climate management in India

The Government of India has taken several initiatives towards practicing sustainable development by means of **energy security, climate resilience** and **optimum consumption** of natural assets. Utilization of solar power for energy production is the prior most initiative taken by the government for approaching sustainable development goals. India has led the foundation of **International Solar Alliance** with 121 solar energy enriched countries for implementing innovation in solar technologies in future (Shidore and Busby, 2019). It is a notable approach towards stepping for alternative energy resources that would lower the utilisation of LPG (Liquified Petroleum Gases) and reduce consequent air pollution. Another important initiative is the **Green India Mission** to promote afforestation across the country for preserving biodiversity of the natural ecosystem. Since 2015, the STI (Science, Technology and Innovation) has been combined with the SDGs to address societal challenges along with climatic degradation in an optimum way (Surana *et al.* 2020). Presently the Indian government is approaching specific SDGs as follows (Voluntary National Review Report, 2017):

- poverty alleviation and zero hunger
- Well being and healthy life
- Reducing gender inequality
- Innovation in industrial activities and infrastructure development
- Preservation of aquatic life
- Global partnership for sustainable development

The civil service organisations of India plays significant roles in this regard to create awareness among the countrymen regarding the importance of SDGs. Activities performed by this organisation are as follows:

- Conducting awareness campaigns by promoting education content on SDGs and practicing capacity building workshops
- Providing supports to states in planning and implementing sustainable development activities in an integrated manner
- Highlighting issues regarding climatic changes implement suitable policies for sustainable energy management
- Conducting adequate research on sustainable development activities and prepare suitable documentation in this regard to protect the society from vulnerable consequences

Through above mentioned initiatives several benefits can be gained by the society in respect of preservation of natural assets and attainment of economic development in a sustainable manner as follows:

Sustainable agricultural activities

A suitable pest management activity includes utilization of natural pesticides in farmlands that results in maintaining the fertility of agricultural fields. Consequently it reduces the chance of soil erosion, agricultural runoff, and environment pollution. (Mariappan and Zhou, 2019).

Sustainable forestry and aquatic ecosystem

It ensures normal hydrological activities and maintains the natural biodiversity in forest and marine ecosystems. Forests have a significant role in carbon-dioxide absorption and oxygen generation along with preserving soil erosion (Singh *et al.* 2018). A sustainable aquatic ecosystem results in increasing availability of freshwater and helps the survival of aquatic animals appropriately.

Ecotourism activities

It has a significant benefit in respect of making the local residents aware about environmental degradation along with the tourist community. Moreover, the importance of natural assets can also be promoted through this activity. Therefore, preservation of natural resources become possible in environmentally vulnerable locations such as higher altitude of Himalayan cold arid region, desert areas and mountain ranges (Poyyamoli, 2018).

Conclusion

Based on the above discussion it is found that different parameters of population, urbanization, waste management and others create suitable challenges in the conductance of sustainable development activities in India. However, the Indian government has taken suitable initiatives and environmental programmes to promote the usage of renewable energy resources for maintaining a balance between economic development and environmental sustainability. Inclusion of environmental studies at every level of education is significant in respect of making the present generation aware about the importance of sustainable development activities to mitigate climate vulnerabilities. Hence, it would also ensure a sustainable survival of human civilization in the future.

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