

# "Balancing Environmental Protection and Economic Growth: Exploring Sustainable Development and its Challenges"

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## ABSTRACT

Environmental controversy has recently dominated the writing of development literature. As a result of the increasing environmental catastrophes and the growing environmental consciousness, a new model of development called "sustainable development" arose. The direction of modern civilization must now be carefully chosen to maintain and restore the balance between environmental protection and economic growth. The current world demands advancement. One of the largest environmental issues is global warming, along with hazardous pollution, ozone depletion, and the decline of biodiversity. The emission of some greenhouse gases (CO<sub>2</sub>, CFCs, methane, and nitrous oxide) has increased dramatically. To attain sustainable growth swiftly, it is imperative that these challenges be addressed. The current world demands advancement. One of the largest environmental issues is global warming, along with hazardous pollution, ozone depletion, and the decline of biodiversity. The emission of some greenhouse gases (CO<sub>2</sub>, CFCs, methane, and nitrous oxide) has increased dramatically. To attain sustainable growth swiftly, it is imperative that these challenges be addressed. The current study, which is based on secondary data analysis from sources including books, journals, newspapers, and official documents of the Indian government and other international organizations, has concentrated on the primary environmental problems for sustainable development. The introduction to sustainable development and the environment is followed by a discussion of the primary environmental impediments to sustainable development in the current study. The final half of the essay examines the fundamental problems with the sustainable development approach to solving environmental problems and suggests some possible solutions.

**Keywords: Environmental Protection, CO<sub>2</sub> Emissions, Pollution, and Sustainable Development**

## 1. INTRODUCTION

The environmental argument has gained importance as the development of literature has developed recently. The current trend in population growth, consumerism, and socio-ecological dysfunction have raised questions about the biosphere's long-term viability. If human needs are to be met in the future in a way that is sustainable, these problems must be resolved as soon as possible. According to M. Shamsul Haque, a new paradigm for development called "sustainable development" started to take shape around 2000 as environmental catastrophes deteriorated and environmental consciousness rose. The future must be carefully prepared to restore and maintain

the balance between the environment and progress because modern society has reached a turning point. Environmentally friendly policies as shown in figure 1, are frequently recommended by proponents of sustainable development, who also provide institutional and legal safeguards and raise public knowledge of the sustainability concepts through international forums and publications. The current debate has centered on the major environmental barriers to sustainable development.



**Fig.1 Measures in Environmental Initiatives**

## 2. SUSTAINABLE DEVELOPMENT

It seems that the definition of sustainability and the requirements for achieving sustainability have been mixed up in most of the literature on sustainable development. In discussions on sustainable development, the Brundtland Commission report and the World Conservation Strategy are frequently mentioned. The report of The Brundtland Commission, published in 1987, is titled "Our Common Future". According to this study, sustainable development is a process that meets current needs without endangering the capacity of future generations to satisfy their own desires as shown in fig.2. Sustainable development is a strategy for promoting human well-being while protecting the carrying capacity of supporting ecosystems, according to the World Conservation Strategy from 1980.

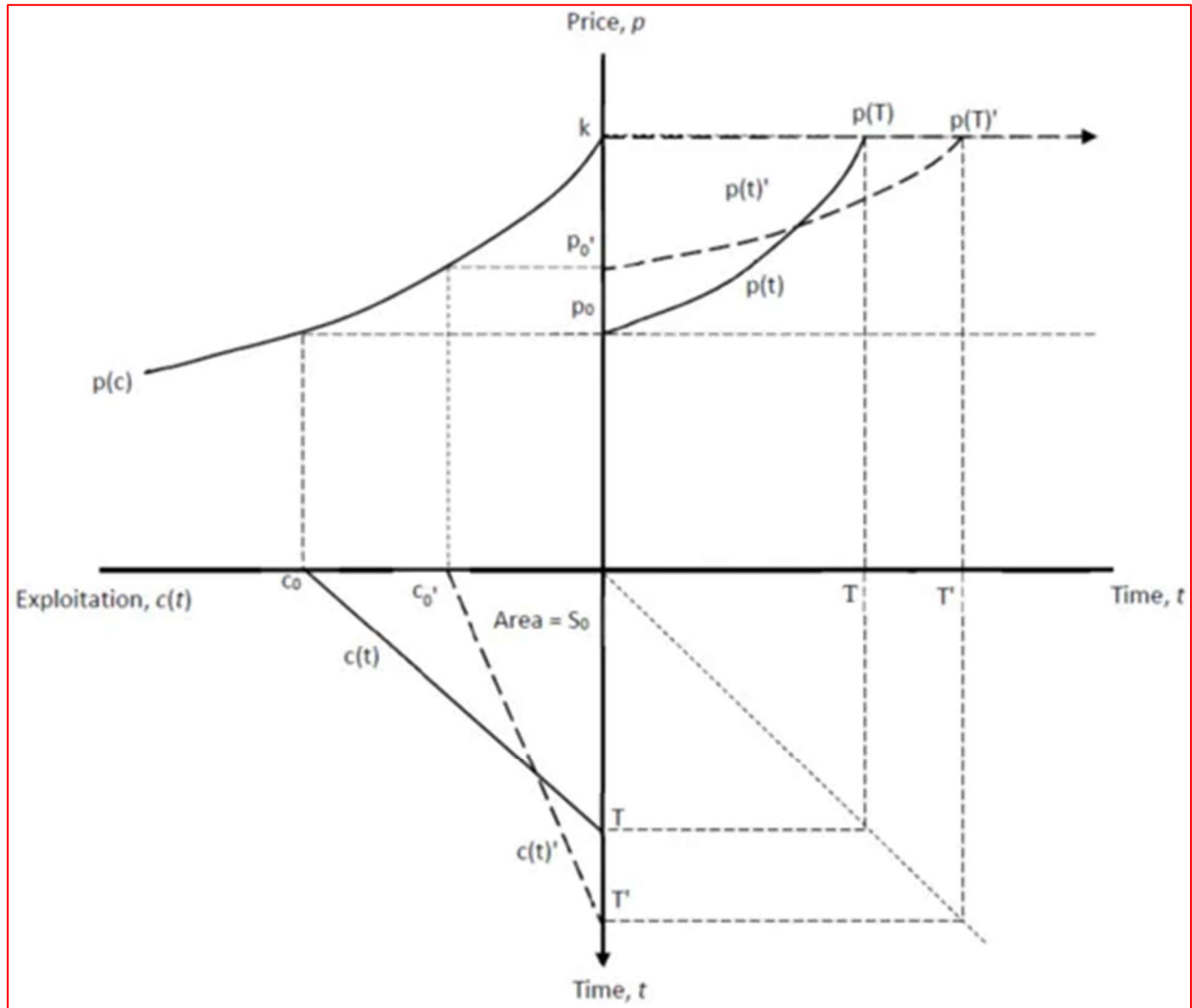


Fig. 2: Exploitation and Price paths over time

This four-quadrant figure shows the exploitation and price paths over time for the resource comprising the safe operating space. The upper right quadrant shows the price path for the resource which is rising over time. The upper left quadrant shows the resource demand curve, with a choke price of  $k$ . The lower left quadrant shows the exploitation path of the resource stock. The lower right quadrant maps the time axes by a  $45^\circ$  line. The initial price is  $p_0$  at time  $t = 0$ , which rises over time to reach the choke price  $k$  at  $p(T)$ , where the demand for the resource goes to zero. At this point, the accumulated extraction of the resource (the area within the exploitation path  $c(t)$ ) is exactly equal to the total initial resource stock,  $S_0$ . In this figure, we show a comparison of the exploitation of the safe operating space in competitive markets (solid lines) as opposed to a monopolistic market (dotted lines).

### **3. REQUIREMENT FOR ENVIRONMENTAL CONCERN**

The concept of environment encompasses all interactions between living things, the climate, the weather, and the natural resources that influence human existence and economic activity. Nair (1993) made the case that man has an obligation to do action to stop the environmental destruction since he is the architect of his own destiny. The problems linked with pollution have greatly increased due to industrialized countries' rapid growth in the industrial and agricultural sectors. Among the environmental concerns because of this procedure were ozone depletion, climatic change, and physical upheaval. Human activities are to blame for the destruction as well as the degradation of soil, erosion, desertification, and even natural disasters like floods, hurricanes, and other disturbances to the emerald cover. The loss of biodiversity, which influences how development is carried out, is one of the most negative consequences of the depletion of environmental resources. The intensity of the effects of environmental degradation on development and people varies based on the ecosystem, community structure, and human settlements. It is important to recognize that nature is made up of innumerable species, of which man is just one. Nature is not obligated to man; man is owed to nature. Man, considered to be the most intelligent animal on the earth, should have the responsibility of acting as a trustee for the great natural wealth.

## **4. Sustainable Development Environment Challenges**

### **4.1 Global Warming**

The term "global warming" describes a gradual rise in the average temperature of the atmosphere. In its final report, which was published in August 1990, the Inter-governmental Panel on Climate Change (IPCC), an initiative of the United Nations, also confirmed the reality of the rise in world temperature. If global warming is not stopped, it would increase by an average of 0.3 degrees Celsius per decade, reaching 2.4 degrees Celsius over the course of the next century. In terms of its negative effects, global warming has resulted in an unprecedented rise in sea level due to glaciers melting and the oceans' thermal expansion as shown in figure 3. One of the more hazardous repercussions of global warming is the change in the climate and the attendant aberrations. As a result, there is a storm there, a flood here, and a drought there. Due to fast industrialization, the burning of fossil fuels, and significant deforestation carried out in the name of progress, there has been an alarming increase in the release of various greenhouse gases, such as carbon dioxide, chlorofluorocarbons, methane, and nitrous oxide. Global warming would lead to shorter cold seasons and longer warm ones. The northern region's agricultural output will be severely hampered by warmer winters and longer summers. As a result, extreme weather would become frequent, resulting in the catastrophic annihilation of forest vegetation and fauna. In terms of carbon dioxide emissions in 2017, India came in fourth place (7 percent emission).

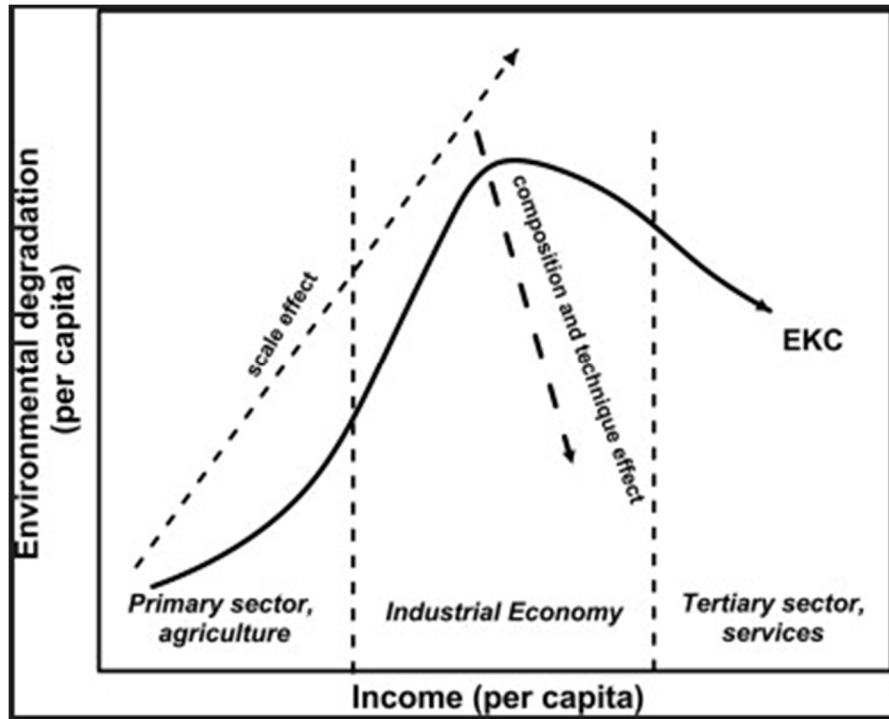


Fig.3: Scale, composition, and technique effects on EKC

### 4.2 Depletion of Ozone Layer

Due to the vast buildup of gases and chemicals emitted by industrial plants and automobiles, the much-touted measures of development, the ozone layer, which serves as a shield to protect life on earth from the sun's deadly UV rays, has been depleted as shown in figure 4. According to NASA scientists, an ozone hole has already developed above the continent of Antarctica.

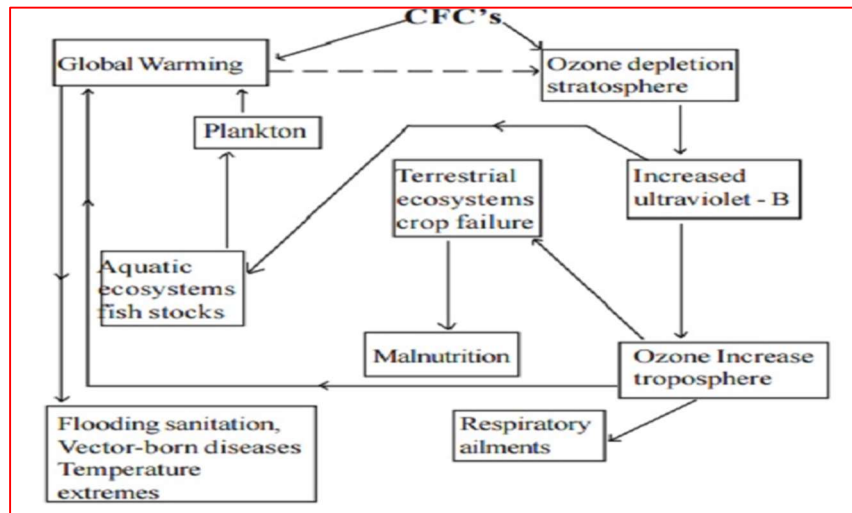


Fig.4: Ozone is a form of oxygen (O<sub>3</sub>). In the stratosphere (ozonosphere), ozone blocks out the sun's ultraviolet rays and is a lifesaver.

According to a 1992 investigation by the World Watch Institute, the ozone layer in the northern hemisphere is disappearing twice as quickly as specialists had previously estimated. A large loss of the ozone layer, in the opinion of scientists, would be exceedingly hazardous to not only humans but also to other animals, plants, birds, insects, and certain marine life. Skin cancer and eye damage in humans and other living things would increase. India has produced and used nine of the 96 ozone depleting substances (ODSs) covered by the Montreal Protocol.

### 4.3 Pollution

Toxic pollution is yet another unfavorable consequence of industrial development. This is brought on by industrial plants releasing toxic and hazardous solid and liquid pollutants. As per figure 5, Toxic pollution of the air and water has grown to be a major concern in the modern world.



**Fig.5: Toxic pollution, climate risks directly harm human health.**

- 4.3.1 Pollution of the air:** Industrialization has led to dirtier air globally because of obvious smokestacks and exhaust pipes from companies and transportation networks that discharge toxic pollutants into the atmosphere. Major problems are seen in cities with increasing car populations, such as Kolkata, Delhi, Seoul, and Mexico City. The World Health Organization ranked New Delhi the most polluted city in the world in May 2014. In November 2016, the Great haze of Delhi, a natural disaster, covered New Delhi and the surrounding areas in the worst haze in 17 years. The odd-even formula was trialled by the Delhi government over the course of two consecutive fortnights in 2016. The Supreme Court of India further barred the sale of fireworks in Delhi-National Capital Region for the traditional holiday of Diwali in October 2017. The National Air Quality Monitoring Programmed in India is overseen by the Central Pollution Control Board.
- 4.3.2 Water pollution:** To date, development has the same tendency to transform clean water into dirty water as it does to turn clean air into bad air. More than 30% of Indians, according to estimates, do not have access to clean drinking water. Only 209 of India's 3,119 towns and cities have full wastewater treatment facilities, and only 8 have full sewage treatment facilities, according to a 1992 World Health Organization report.

According to UN predictions, the demand for freshwater would increase globally by 40% by 2030 because of population expansion, climate change, and human activities. The nation's Technical Centre, Bengaluru, is currently coping with a significant water problem.

#### 4.4 Biodiversity Decline

Another significant environmental issue is genetic erosion, which is sometimes referred to as the loss of biodiversity. The primary culprits are development projects that cause significant habitat harm to plants and animals, such as large dams, fertilizer plants, and power projects. As per figure 6, The rapid deforestation and land degradation brought on by development is another factor in genetic extinction. An estimated 17 million hectares of forest are lost annually.

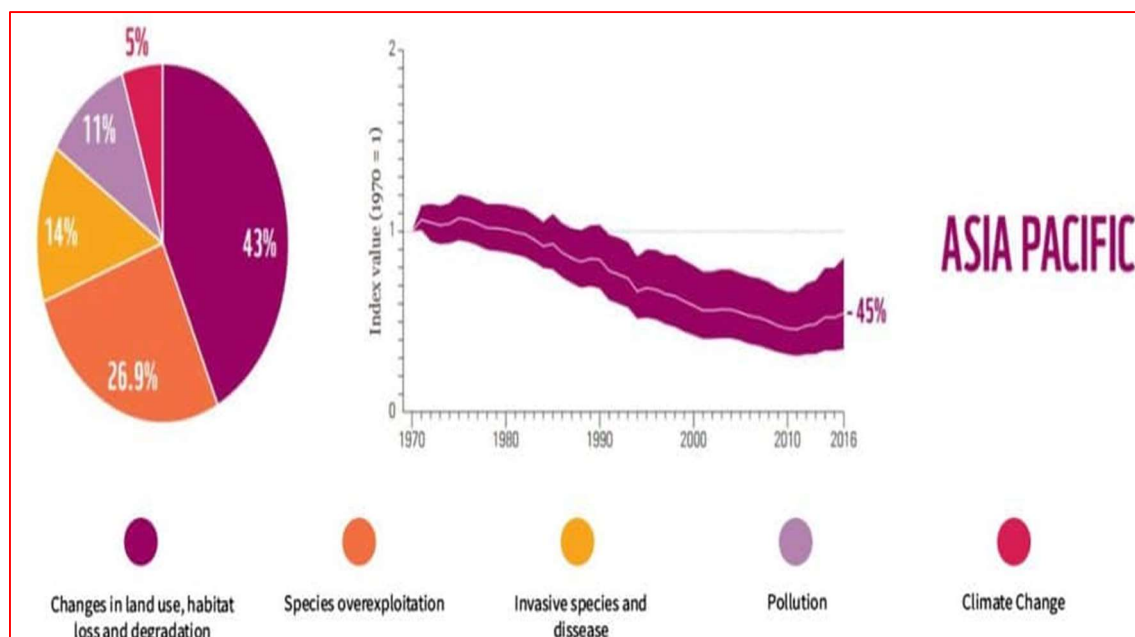


Fig.6: The Statistics of Biodiversity Loss

### 5. Limitations of the Sustainable Development Paradigm in Addressing Environmental Issues

Despite the evident focus of the sustainable development model on the relationship between the environment and development, several model defects need to be examined. Environmental issues must be adequately investigated if they are to be resolved. The following is the list:

- Despite its concern for the environment, the sustainable development model is hindered by its consistency with the goal of economic expansion, which frequently damages the environment itself. Despite advocating for development based on environmental

sustainability, the Brundtland Report (Our Common Future) keeps highlighting "the prospect for a new era of economic growth" as shown in figure 7.

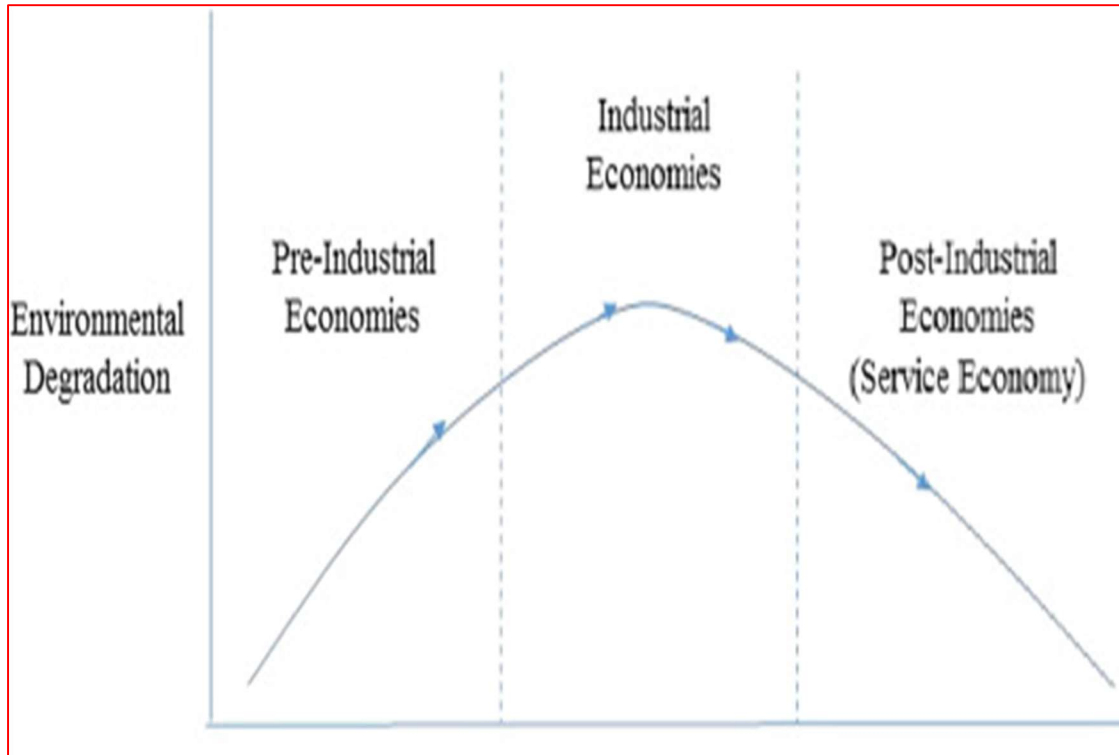


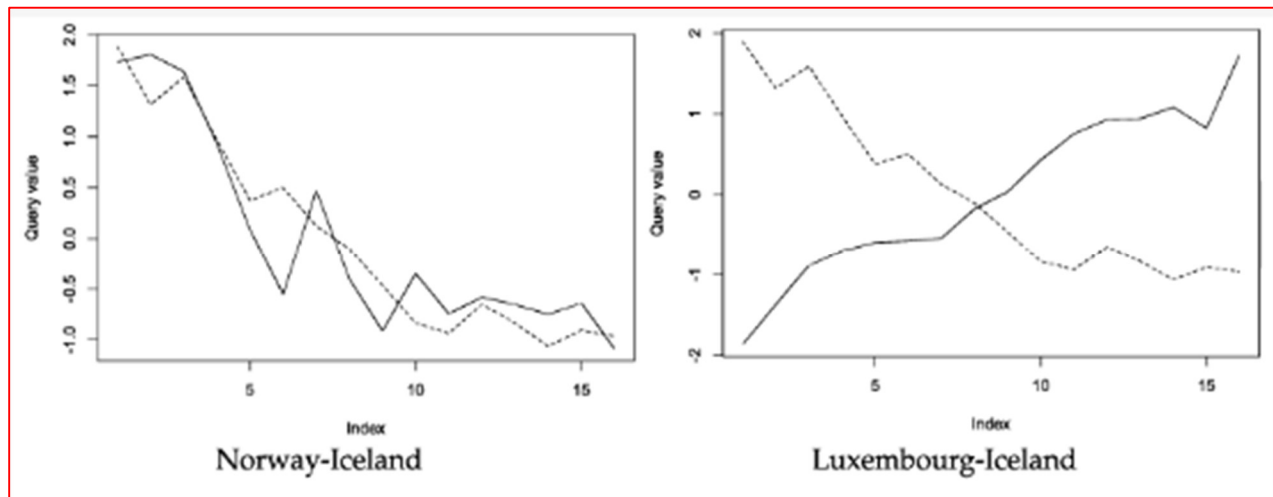
Fig.7: Stages of Economic Growth

- Another drawback of the sustainable development model is its tendency to perceive progress in terms of consumption levels. The core concern of this model, which is that the current generation's excessive resource consumption may jeopardize future generations' ability to consume resources at a similar level, is clear evidence of its belief in consumption-centered growth.
- The processes of interclass and global inequality that have a negative influence on the environment are not given enough attention by supporters of sustainable development, even though intergenerational fairness is one of their main concerns.
- The sustainable development paradigm does not adequately address the effects of domestic and international power structures on the acceptance and implementation of environmental protection agreements, conventions, laws, and regulations.



## 5.1 Solutions to above Issues

In order to build a sufficient model of sustainable development, it is necessary to look beyond the narrow focus on economic growth and place more emphasis on a thorough understanding of development that takes into account the environmental costs of such economic growth; to reexamine the tenets of modernity and value the environmentally friendly indigenous cultures in different regions of Norway, Luxembourg and Iceland as shown in figure no 8; and to concentrate on the detrimental effects of consumer culture on the environment. It's crucial to make significant reforms to unfair economic structures and to pass strong laws protecting the environment to reduce interclass and worldwide imbalances that have a harmful influence on the environment.



**Fig.8:** Norway and Luxembourg are marked with solid and Iceland is marked with a dashed line.

## 6. CONCLUSION

Two well-known eco-awareness efforts in India, the Chipko Movement, and the Save Narmada Movement, seek to inform the populace and the government about the environmental calamity. According to Part IV, Article 51 of the "Constitution of India," "every citizen of India shall be obliged to safeguard and improve the natural environment, including forests, lakes, rivers, and wildlife, and to have compassion for living characters." Every Indian citizen should participate to achieve sustainable development. The preservation and protection of the natural environment alone cannot address the problem of ecological imbalance. A physical, social, political, cultural, and global plan is necessary for ecological restoration and sustainable development.

## REFERENCES

- [1] Bampatsou C. & Halkos G.E. (2016). Investigating the effect of efficiency and technical changes on productivity," MPRA Paper 76287, University Library of Munich, Germany.
- [2] Bampatsou C. & Halkos G.E. (2017). Technical efficiency, productivity change and environmental degradation. MPRA Paper 77176, University Library of Munich, Germany.
- [3] Barbier E.B. (2015). Nature and wealth: Overcoming environmental scarcities and inequality. Palgrave MacMillan, London.
- [4] Callens I. and Tyteca D. (1999). Towards indicators of sustainable development for firms: A productive efficiency perspective. *Ecological Economics* 28: 41-53.
- [5] Halkos G.E. (1993). Sulphur abatement policy: Implications of cost differentials, *Energy Policy*, 21(10): 1035-1043.
- [6] Halkos G.E. (1994). Optimal abatement of sulphur emissions in Europe, *Environmental & Resource Economics*, 4(2): 127-150.
- [7] Halkos G.E. (1996). Incomplete information in the acid rain game, *Empirica*, 23(2): 129- 148.
- [8] Halkos G.E. (2003). Environmental Kuznets Curve for sulfur: evidence using GMM estimation and random coefficient panel data models, *Environment and Development Economics*, 8(4): 581-601.
- [9] Halkos G.E. (2006). Economic Development and Environmental Degradation: Testing the existence of an Environmental Kuznets Curve at Regional Level. Conference Paper ersa06p527, 46th Congress of the European Regional Science Association (ERSA): "Enlargement, Southern Europe and the Mediterranean", August 30th - September 3rd, 2006, Volos, Greece.
- [10] Halkos G.E. (2013). Exploring the economy-environment relationship in the case of sulphur emissions. *Journal of Environmental Planning and Management*, 56(2): 159-177.
- [11] Halkos G.E. (2015). Climate change actions for sustainable development. *International Journal of Innovation and Sustainable Development*, 9(2): 118-136.
- [12] Halkos G.E. and Salamouris D.S. (2004). Efficiency measurement of the Greek commercial banks with the use of financial ratios: a data envelopment analysis approach. *Management Accounting Research*, 15(2): 201-224.
- [13] Halkos G.E. and Papageorgiou G.J. (2016). Spatial environmental efficiency indicators in regional waste generation: A nonparametric approach. *Journal of Environmental Planning and Management* 59(1): 62-78.
- [14] Halkos G.E. and Tzeremes N. (2011). Growth and environmental pollution: empirical evidence from China. *Journal of Chinese Economic and Foreign Trade Studies*, 4(3): 144-157 [15] Huppel G. and Ishikawa M. (2005). Eco-efficiency and its terminology. *Journal of Industrial Ecology*, 9: 43-46. Kuosmanen T. and Kortelainen M. (2005). Measuring eco-efficiency of production with data envelopment analysis. *Journal of Industrial Ecology*, 9: 59-72.
- [16] Porter M.E. and van der Linde C. (1995). New conception of the environment competitiveness relationship. *Journal of Economic Perspectives*, 9: 97-118.
- [17] Tol R.S.J. (2001). Equitable cost-benefit analysis of climate policies. *Ecological Economics*, 36: 71- 85.

- [18] Zofio J.L. and Prieto A.M. (2001). Environmental efficiency and regulatory standards: the case of CO<sub>2</sub> emissions from OECD industries. *Resource and Energy Economics*, 23(1): 63-83.
- [19] Haque, M. Shamsul. 2000. "Environmental Discourse and Sustainable Development: Linkages and Limitations", *Ethics and the Environment*, Vol.5, NO.1, pp: 3-21
- [20] Muzalev, Sergey & Kukushkin, Sergey & Grazhdankina, Olga & Nikolaenko, Anastasia. (2022). Sustainable and Environmental Development of Energy Economy in Smart Regions of Russia. *Frontiers in Energy Research*. 10. 943270. 10.3389/fenrg.2022.943270.