

Environment and Economics: A Theoretical Overview

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Abstract:- This paper provides a theoretical overview of the relationship between the environment and economics, tracing the evolution of economic thought from classical to contemporary approaches. Early economic theories, such as those of the Physiocrats, linked natural resources to economic value, while classical economists, including Adam Smith and David Ricardo, discussed the limits of resource availability in the context of economic growth. The rise of industrialization further intensified concerns about resource depletion and environmental degradation, prompting the emergence of environmental economics and ecological economics. These fields challenge traditional economic models, which often treat the environment as an externality, and emphasize the need to integrate environmental limits within economic frameworks. The paper explores a variety of theoretical perspectives, including the neoclassical view of market efficiency, the ecological Kuznets curve, and ecological economics, which recognizes the finite nature of natural capital and calls for a sustainable approach. The discussion also touches on issues of equity and sustainability, advocating for intergenerational and intra-generational justice in environmental policy. Ultimately, the paper argues that integrating environmental considerations with economic thinking is essential to achieving long-term sustainability and addressing the global challenges of climate change and resource depletion.

Keywords:- *Environmental Economics, Ecological Economics, Economic Growth, Natural Resources, Environmental Degradation.*

I. INTRODUCTION

We live in the *Anthropocene* epoch, an unofficial unit of geological time in which human activity has significantly impacted the planet's climate and ecosystems. The modifications that man made on his living planet and its impacts became a topic of relevant discussion in the current period. The available historical evidence shows that the present-day economy evolved from the nature-based human settlements of the early times. The beginning of settlement for agriculture made a difference in human life from other species. With agriculture, man started to create an economy that was different from the economy of nature. All other species similarly continued their life in tune with nature, but

man changed living environment and natural infrastructure according to his needs and comforts. This paper attempts to make an overview of major theoretical standpoints on Environment in economic literature.

II. ENVIRONMENT AND THEORETICAL DEVELOPMENT ECONOMICS

Scarcity was a significant point of discussion in the economic literature from the beginning. Economists have different views regarding the economy and environment and natural resources capacity and economic growth. From the economic literature, it is evident that the Physiocrats of mid-18th Century France were the first school of economic thought who tried to explain the economy through natural law and considered agriculture and cultivable land as the source of net value (Scott Cato, 2021). However, with the arrival of the Mercantilist school of thought, the focus of discussion shifted from the land to the capital. Following mercantilists, classical and neo-classical ideas were developed. Increasing environmental issues resulting from environmental concerns developed new perceptions towards these issues over time. New branches of economic thought like environmental economics, ecological economics and green economics challenged the existing economic view regarding the environment.

The Industrial Revolution in the 18th Century brought widespread changes in existing social, economic, and political order, first in England, then in Europe and later in America. All these changes influenced economists' views towards the environment. During the 19th and 20th centuries, the pace of resource depletion and environmental degradation increased due to rapid industrialisation. Concern about environmental issues among thinkers and economists has also increased. Significant theoretical contributions of different schools of thought are discussed in the following section.

The classical economic literature had been focused on the idea that land and labour are the major factors of production. How to increase the production was their primary concern. Adam Smith, David Ricardo and J.S. Mill were significant contributors in this regard. The economic literature falls under classical tradition was written in the background of the Industrial Revolution. The industrial revolution, population growth, and growth of diversified economic activities increased pressure on natural resources

along with the changes in landscape and quality of the environment. During this period, in the 18th Century, economists and others started to write about environmental issues (Kula, 1998). In *The Wealth of Nations* (1776), Adam Smith comprehensively discussed the mineral industries, including coal, mining, quarrying and extraction of metals in Britain. Smith lived in a period when natural resources seemed inexhaustible. Therefore, he was very optimistic regarding the availability of those natural resources in anticipation of discoveries (Kula, 1998).

However, Malthus and Ricardo, of the same tradition, kept a pessimistic view towards the unlimited availability of resources and unlimited growth. Malthus pointed out that a rapidly growing population would cut short the availability of arable land and the adequacy of food supplies in the future (Malthus, 1798). Later, David Ricardo, in his *Principles of Political Economy and Taxation*, observed that "economic growth would eventually peter out due to scarcity of land and its falling food production capacity, and this would stabilise the population at a subsistence level" (Kula, 1998). Like Adam Smith, Karl Marx also believes that in the natural resource-based sector, there is no tendency for decreasing returns to scale (Kula, 1998). Classical economists take both optimistic and pessimistic views regarding natural resources. Their discussions, especially of optimistic thinkers, are limited mainly in the assurance of availability and non-availability of resources. However, very little importance is given to the result of the unlimited extraction of current and new sources of resources in the future.

The neoclassical views have dominated economic thought since the 21st Century; it is considered mainstream economics, especially in the academic field (Scott Cato, 2021). Neoclassical thoughts are based on a market system where the interaction of supply and demand brings optimum outcomes for all. They favour market mechanisms to determine resource allocation. Here, economic decisions are based on utility maximisation. That means "preferences of as many economic agents as possible are fulfilled to the maximum extent possible given the limited available resources" (Scott Cato, 2021). Neoclassical economists view the market as an effective system for organising the economy. Pareto efficiency can be used to convey the concept of efficiency. According to Pareto efficiency, resource distribution is efficient if anyone receiving some of it might get more without taking some of it away from somebody else.

Though they are aware of the scarcity of resources, they never think limitations in the resource availability put obstacles to unlimited growth. Thus, to neoclassical economics, natural resource constraints never limit economic growth. They argue that limitless scientific and technological advancement increases the efficiency in using natural resources, and capital, labour, and natural resources can perfectly replace one another (Romeiro, 2012). As per this view, the loss of the natural ecosystem can be replaced by capital. It is a notion of weak sustainability. Solow's famous observation summarises the neoclassical view of the

environment: "The world can, in effect, get along without natural resources, so exhaustion is just an event, not a catastrophe" (Solow, 1974). The Hartwick Rule, which assures investment compensates future generations for asset losses caused by current consumption and production, is the underlying idea behind this (Romeiro, 2012).

However, changes in the environment indeed affect the economy as both are closely connected. A considerable volume of resources is required for the smooth functioning of an economy and its activities. The environment is a significant source of inputs and resources for the economy. The economy extracts resources from the environment and puts wastes and emissions of consumption and production activities on it. Thus, with economic growth, the environmental quality decreases. Marshall's concept of external economies gave a new analytical framework for environmental issues (Marshall, 2009). Marshall counted only the benefits of economic actions, but externalities were the key to economic analysis of environmental problems (Kula, 1998). The concept of externalities extended to the benefits and costs of economic activities on the environment by later economists (Pigue, 1920 and Kapp, 1950). Externalities are considered market failure, and neoclassical economists deal with environmental problems under market failure. Economic activities create a network of negative externalities, which badly affect the environment and people living in it, those who were not involved in that economic transaction. Thus, environmental issues can be considered as the negative externalities of economic growth. The planet is the sole place to live for human beings and other animals; therefore, balancing economic development and environmental quality is paramount.

In the later period, different thoughts on environmental issues, from the economic standpoint, originated around the concept of market failure of neoclassical schools. Environmental economists analysed the environmental question using the theoretical framework of Neoclassical. They tried to solve the environmental issue through the market mechanism. The problems of public good, common good, negative externalities, and property rights as a solution for environmental issues were discussed under environmental economics. The nature of the ownership of resources plays a significant role in the economics of resources. The degree of exploitation depends on the accessibility and ownership of the natural resources. Natural resources like air, atmosphere, river, mineral deposits, stone, and sand are open-access resources (Ostrom, 2009). Many are considered public goods; environmental issues can be considered public bads. Non-rivalry and non-excludability features of public goods aggravate the degree of exploitation.

Unlike private resources, the tragedy of commons and the free-rider problem happens in the case of natural resources. These problems are significant causes of the deterioration of natural resources. Coase's theorem (1960) suggests solutions for negative externalities by internalising the harmful effects of production and consumption through the well-defined property rights system. To him, clarity in

ownership helps to protect natural resources. However, in the case of natural resources, private ownership is not possible, but community ownership is feasible.

Property rights reduce the tragedy of commons and the negative externalities. Like the type of ownership, the type of natural resource is also important from the environmental point of view. All resources are not exact. Specific features of some resources increase the intensity of deterioration and damage. Natural resources are generally classified into two: renewable and non-renewable resources. Continued extraction of non-renewable resources will result in the exhaustion of the stock of those resources. It will damage the natural environment permanently. Therefore, technology, policy and social auditing are needed for the wise use of resources. Fig 1 Summarises the Approach of Environmental Economics.

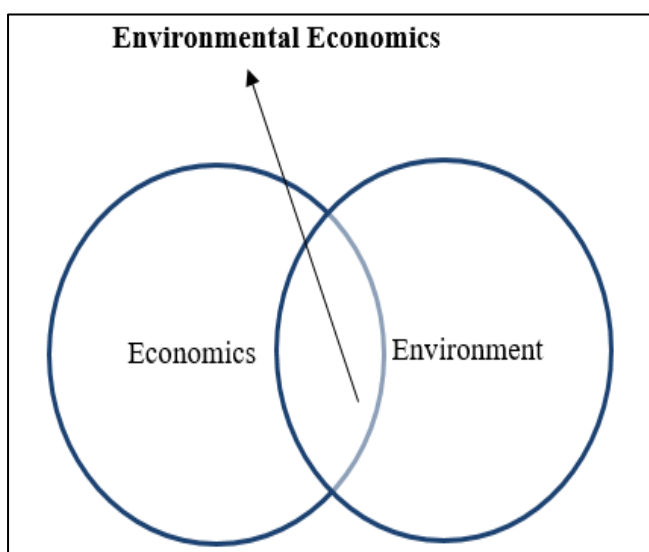


Fig 1 Economics and Environment in Environmental Economics
Source: Sahadeven et al., 2022

By incorporating the value of natural resources into the economic model, environmental economists have made significant progress in this field. They did, however, adhere to a neoclassical framework of analysis. Ecological economics is a new school of thought in this context. Ecological Economics puts the economy as a subsystem inside the environment. They made an effort to integrate the fields of ecology and economics. Ecological economists have switched their focus from weak sustainability to strong sustainability. Under a strong sustainability view, physical capital cannot substitute for natural capital. With the International Society for Ecological Economics founding in 1987 and the publication of the Journal of Ecological Economics in 1989, the academic subfield of ecological economics was established in the 1980s (Scott Cato, 2011).

Environment as a source of resources and as a provider of ecosystem services play a significant role in the functioning of an economy. From the viewpoint of ecological economics, the environment represents an absolute limit to economic growth. The analogy used by

Boulding (1966), "cowboy economy¹" and the "spaceship economy²" narrates the two different situations of resource availability. The second law of thermodynamics, the law of entropy³, is applicable here. The theoretical premises of ecological economics are based on these laws and assumptions. Human expansion over the planet and exhaustion of resources are becoming a threat to the survival of nature and human beings. Economists like Herman Daly (1996) suggest that zero growth is the only way to prevent extinction. However, de-growth seems an extreme option, and it will not be feasible for the countries and regions of the developing stage. The discussion on the exhaustion of resources, economic progress and human sustainability were not new in the economic literature (Malthus, 1798; Javons, 1866).

Figure 2 depicts the view of ecological economists. To them, the economy and society are not counterparts of the environment but subcomponents. They place the economy inside the society and the society inside the environment.

- Cowboy economy;
- Spaceship economy: Kenneth Boulding first proposed the idea of cowboy economy and spaceship economy in 1966. In contrast to the spaceship economy, which is closed and has limited resources, the cowboy economy is open and unlimited.
- Law of Entropy: the absolute resource shortage imposed by the entropy law cannot be remedied by technical advancement, exploration, or substitution.

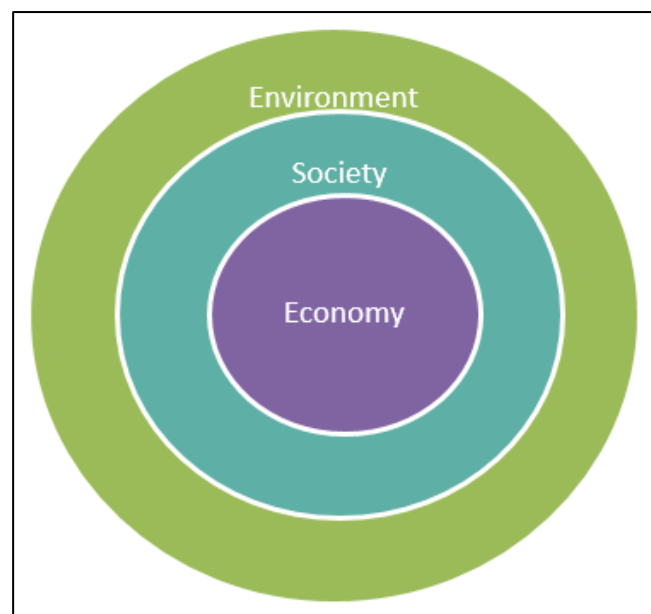


Fig 2 Perspective of Ecological Economics
Source: Passet, 1979

When we analyse the environmental issues from a social justice purview, we can observe that developing and underdeveloped countries bear a significant share of adverse effects of environmental degradation. Countries worldwide are at different stages of development. Therefore, the intensity of development caused by environmental deterioration will differ for different countries. The

Environmental Kuznets Curve (EKC) suggests that pollution and environmental damages will be higher at the early stages of economic growth, but after a specific point, it comes down. Though developed countries are significant polluters worldwide, they can minimise environmental damage in their regions by adopting sophisticated technologies. However, the global effects of environmental damage hit the low-income countries and low-income sections of people more intensively because they are more vulnerable compared to the rich people and developed countries. Thus, the problem of environmental issues becomes more complicated.

III. DISCUSSIONS ON SUSTAINABILITY

This disparity also makes discussions on sustainability more complex. Sustainability is an essential goal to achieve, and it is a necessity for the survival of humankind. Nevertheless, justice in the way to sustainability is also

essential. Here, we have to analyse the intergenerational equity and intra-generational equity. Distributive justice and equity are essential for achieving intra-generational and intergenerational equity—the renowned sustainability definition of Brundtland Commission bases Intergenerational equity theory. Sen's capability approach and freedom-oriented human development are criticised (Pelenec et al., 2013). Sen holds a different view on this; "a fuller concept of sustainability has to aim at sustaining human freedom, rather than only at our ability to fulfil our felt needs" (2013). However, his views are criticised for lack of environmental concern. Achieving intergenerational equity without intra-generational equity and distributive justice is impossible. Thus, sustainability should be wide enough to incorporate these factors, too.

The different views of sustainability and their characteristics are discussed in diagram 3.

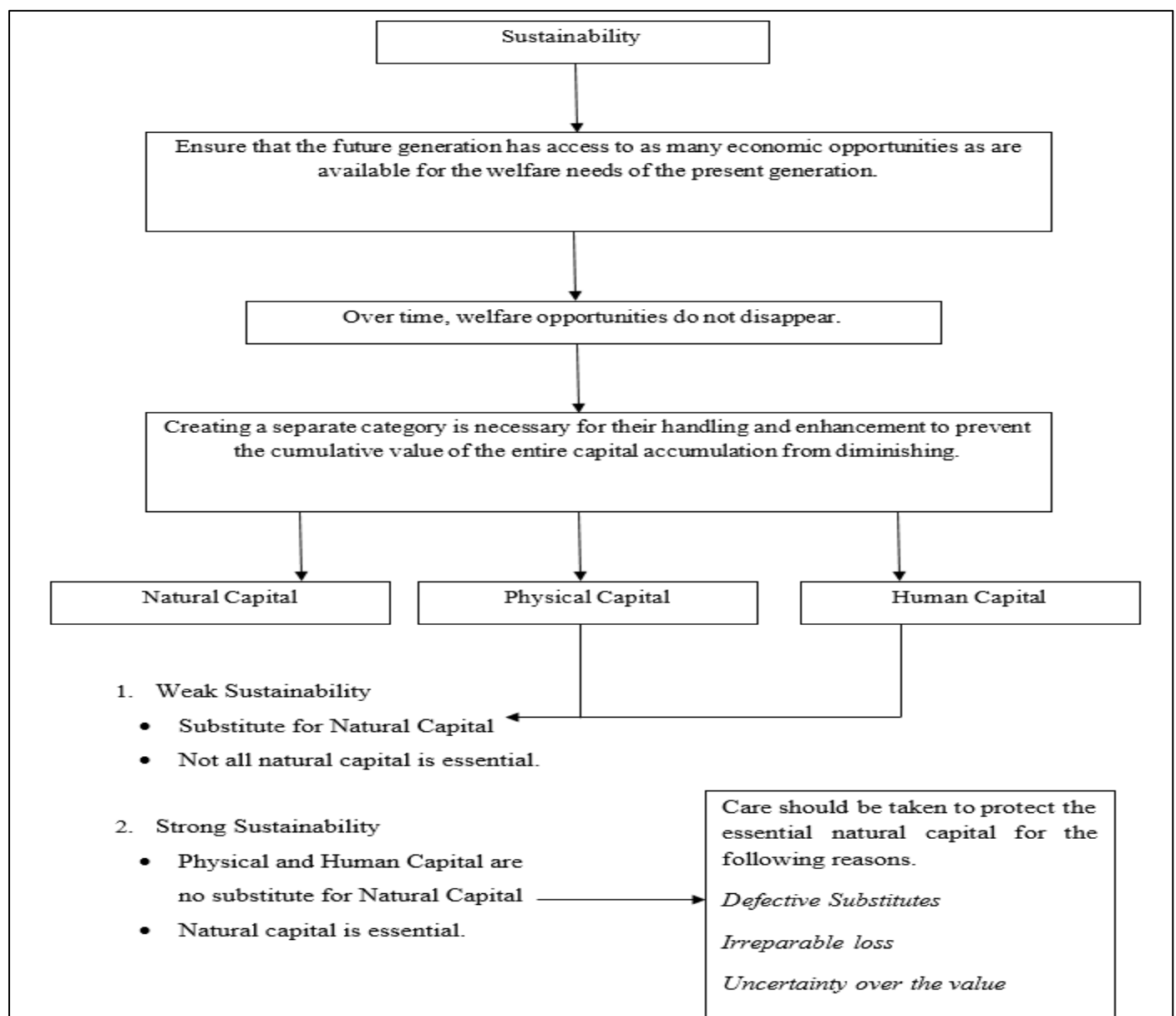


Fig 3 Natural Capital and Strong and Weak Sustainability Notions

Source: Shadevan, 2022

IV. CONCLUSION

The relationship between the environment and economics is a complex and evolving field of study, shaped by various theoretical frameworks. Classical and neoclassical economics generally emphasize the importance of market efficiency and economic growth, often considering the environment as an externality to be managed or mitigated through market mechanisms such as tax or tradable permits. From this perspective, environmental degradation is seen as the result of market failures, and the solution lies in aligning economic incentives with environmental protection, often through the pricing of environmental goods and services. However, this approach has been criticized for underestimating long-term environmental costs and ignoring the limits of natural resources. For example, the ecological Kuznets curve indicates that environmental degradation may initially worsen with economic growth but improve in later stages of development. This has triggered a debate about whether economic growth can be separated from environmental harm.

In contrast, environmental economics and other alternative frameworks challenge classical and neoclassical perspectives by recognizing the limited nature of ecological systems and advocating for a more integrated approach. These perspectives emphasize that economic models need to consider the interdependence between nature and human systems and propose solutions that prioritize environmental sustainability along with economic development. Concepts such as steady-state economics, circular economies, and the evaluation of ecosystem services highlight the importance of reducing reliance on traditional growth models and shifting to more sustainable practices. As global challenges such as climate change and resource depletion exert more pressure, it is clear that classical and neoclassical perspectives need to be developed by integrating environmental considerations. This shift to a more comprehensive economic framework is critical to ensuring that future economic policies not only foster prosperity but also protect the planet's ecological health for generations to come.

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