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ECONOMICS OF RESOURCE SCARCITY AND PHILOSOPHY OF SUSTAINABLE DEVELOPMENT: AN ANALYSIS GIVEN BY ECONOMICS

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RESEARCH ARTICLE

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Abstract

Economics deals with the study of satisfying human wants utilizing the scarce resources optimally. This also incorporates the inflow of resources from nature into the process of production and the outflow of wastes back to nature from the processes of production and consumption.

Further, the philosophy of the term sustainable development is also grounded on the perception of resource scarcity. The term 'sustainable development' is used to elucidate the 'balance between economic growth and conservation &protection of the environment, meeting the needs of the present generation without compromising the needs of future generations.'

In this backdrop, the paper attempts to amalgamate the economics of resource scarcity and the philosophy of sustainable development along with the initiatives adopted to end poverty, reduce inequality, and spur economic growth to ensure a more satisfying, peaceful, and affluent world by 2030' under Sustainable Development Goals (SDGs).

Keywords: *Scarcity, resources, sustainable development, economic growth, Sustainable Development Goals*

Introduction

Excess of demand for a natural resource over its supply creates resource scarcity, causing the supply of accessible resources to decrease. The resource, consequently, may become less accessible and affordable to the less privileged, resulting in unsustainable growth, an increase in inequality, and thereby leading to a rise in societal costs. Concern and debate over resource scarcity date at least as far back as Malthusian predictions that population expansion would occasionally outpace food supply, leading to depopulation and poverty. There is still concern about resource scarcity, especially because some regions of the world are seeing rapidly rising demands for resources. As humans battle for increasingly scarce resources, this concern reflects both the immediate consequences of resource scarcity and potential indirect implications. There is also a growing concern that increased efforts to secure diminishing resources may lead to environmental degradation. Neo-Malthusians believe that the expansion of human population and their consumption are strictly constrained by the availability of finite natural resources. Poverty and social disintegration will be on rise if such boundaries of resource availability are crossed. Neoclassical economists contend that human population, consumption, and affluence should have definite limits. Economic institutions, in particular, that operate effectively, offer incentives for resource substitutes, conservation efforts, creation of new resource stocks, and technical innovation. On the contrary, the other school of economists opine that human population expansion may have resource constraints, but the crisis is all due to unequal distribution of wealth and resources across all scales. Having this perspective in mind, sub-optimal resource management and rapidly increasing population may be considered as the causes of poverty and inequality across the planet. Hence, economics of resource scarcity and the philosophy of sustainable development are perceived to have strong connections both in terms of perceiving the notion and executing the same to make this earth a better place to live. In this connection, the paper is an attempt to trace out the linkage between the economics of resource scarcity and the philosophy of sustainable development. Few Sustainable Development Goals that are adopted to end poverty, reduce inequality and spur economic growth to build more peaceful, prosperous societies by 2030, are also analysed in this paper that substantiate the connection.

Review of Literature

The basic problem in economics is to sort out a process to allocate or manage resources, minimizing the 'gap' between the demand for and supply of goods among individuals. The fact that there are not sufficient resources to completely meet everyone's needs has been recognized as a scarcity problem, and it's expected that this state of affairs will continue to remain for many

years to come. Even though people have been urged to lessen their consumption and demand, specifically people with high incomes, these appeals appear to have been disregarded (Daly, 1980). It is expected that this scarcity will continue, especially due to 'natural resource depletion and environmental deterioration'. However, optimists contend that the scarcity of natural resources will probably no longer be as great of a barrier to the fulfillment of human wants, especially in light of technological growth (Hauge & Tanja, 1998).

Development may be defined as 'an evolutionary process whereby humans become more capable of creating new structures, overcoming difficulties, adjusting to constant change, and making purposeful and inventive efforts to achieve new objectives' (Peet, 1999; Du Pisani, 2006). Reyes (2001) defines 'development as a condition when the demands of the population of a country are fulfilled through the sustainable and judicious use of its natural resources'. According to Todaro and Smith (2006), development is an all-around progression towards economic growth, poverty alleviation, and noteworthy positive transformation in institutions, attitudes, and social structures in addition to these changes.

The definition of sustainable development may be best understood by ecologists, economists, and biologists who comprehend the fundamentals of resource scarcity as a trajectory that optimizes the long-term net benefits to mankind while accounting for the costs of environmental deterioration. In addition to income increases and a decline in poverty and unemployment, net benefits also include improved living conditions. When interpreted this manner, sustainable development emphasizes the need for sensible development rather than the necessity to restrict it to improve conservation efforts (Gillis M., 2005). Both Cerin (2006) and Abubakar (2017) contend that sustainable development is an important concept in the agenda and policy for global development, which offers an option for society to interact with the environment without threatening the resources required for future generations. Accordingly, it is the development that supports raising standards of living, protecting the ecosystems, encouraging afforestation, and reducing pollution of air and water, resisting climate change, and protecting species from annihilation (Browning & Rigolon, 2019).

Objectives

The broad objective of the paper is to look into the philosophy of 'Sustainable Development' from the perspective of the basic problem of every economy, i.e., the problem of resource scarcity. In order to attain the objective, the paper traces out the linkage between the Economics of Resource Scarcity and the Philosophy of Sustainable Development and emphasises on proper execution of SDGs to make survival of mankind on the planet sustainable.

Methodology

The paper, being an entirely theoretical one, collects all information from secondary sources. The paper is analysed from three different perspectives and hence, is divided into three sections.

Section I: Resource Scarcity & Central Problems of an Economy

Section II: Growth, Development & Sustainable Development

Section III: Resource Scarcity & SDGs

Analysis & Discussion

Section I: Resource Scarcity & Central Problems of an Economy

Resource is generally defined as a source from which an individual or a society reaps benefit that gives utility. Resources encompass all things existing in our environs that can be used to meet our requirements, so long as they are economically, technologically and culturally viable. The resources utilized to produce goods or provide services are known as economic resources.

Resources can be classified into two categories based on their availability: renewable and non-renewable. Resources classified as renewable are those that, even after continuous utilization, cannot be depleted, e.g., sunlight, wind, timber, biogas, tidal energy, *etc*. The non-renewable resources, that are once used up, cannot be readily replenished, e.g., fossil fuels, such as coal, petroleum, natural gas, metal ores, rare minerals, nuclear energy, *etc*.

Resources are not adequate to bring into being all the goods and services that are demanded by the people. Here comes the concept of 'scarcity.' The concept of scarcity originates from the proven fact that economic resources are limited and can be used in a variety of ways to produce goods that in the economy are in high demand, creating excess demand. Due to scarcity, resources need to be allocated between competing ends.

Scarcity may be demand-induced, supply-induced or structural. Demand-induced scarcity arises when a resource is in higher demand but its supply stays constant. The reasons are manifold. It may be due to a rising population or a rise in income that helps people to consume more resources compared to the previous periods, or it may be due to a preference shift for commodities. Supply-induced scarcity is the second kind of scarcity, where the supply gets drastically decreased, widening the gap between resource availability and its demand. Bad weather (drought or flood), crop failure or degradation of supply may be the causes for a decline in supply. Structural scarcity relates to the issue of uneven distribution of available resources across the population, which may be due to lack of access, inequality, or other socio-economic reasons.

Scarcity, again, gives rise to the central problems of an economy, which include:

(i) **Allocation problem**, which refers to the choices made about which commodities to produce and in what amounts (*What to produce?*)
(ii) **Production problem**, that talks about the choice of techniques to produce goods and services (*How to produce?*)
(iii) **Distribution problem**, which refers to the decision of what goods to provide for which sections of the society (*For whom to produce?*) and
(iv) Finally, to ensure optimal utilization of resources for sustainable growth.

Thus, the central problems arise from scarcity that calls for the effective distribution of finite resources to satisfy infinite number of wants and needs.

At this point, the notion of 'Sustainable Development' speaks for a development process that satisfies the demands of the present generation without reducing the ability of the coming generations to fulfil their needs.

Section II: Growth, Development & Sustainable Development

Economic growth refers to increase in income or output of goods in a country relative to a prior period in per-capita real terms. Whereas, economic development relates to sustained, long-term growth and improved real income for a country, rise in literacy rate, improved basic infrastructure, lowering poverty and unemployment. Though economic development improves the standard of living, yet consequent exploitation of natural resources leads to environment pollution.

Economic growth in an economy reduces poverty, cuts unemployment, improves public services with increased spending due to increase in tax revenue, increases consumption, encourages investment, and lessens debt-to-GDP ratios and so on. There is increase in production involving more use of resources, which ultimately is a threat to future generations. Economic growth, with increase in production, results in the formation of more waste materials and more pollutants, leading to diminution of natural resources and reduced productivity. Growth and development of an economy is characterised by rapid industrialization, extensive urbanization, development of up-to-date technology-enabled agriculture, generation of energy, escalating greenhouse gas emissions and many more. All these have detrimental impact on ecological balance, e.g. global warming, weakening of ozone layer, detrimental effect on climate, biodiversity loss, environmental degradation, health hazards, indiscriminate misappropriation of natural resources and so on. This, in turn, leads to the problems of poverty, societal distress, resource depletion and political unsteadiness. Environmental degradation appears to be the cost of development of an economy. Such a phenomenon can be better explained using the concept of Environmental Kuznets Curve (EKC), which 'seeks to establish an inverted U-shaped nexus between income per capita and environmental degradation.' In accordance with the Environmental Kuznets curve, environmental degradation is first brought on by economic development. Later, due to economic growth, Environmental degradation decreases as society's relationship with the environment improves. However, there is much debate on the issue, and it is argued that there is no assurance that economic expansion would result in a better environment; rather, the opposite is sometimes true.

Grossman and Krueger (1991, 1994) analyzed the correlation between economic growth and intensity of pollution. The variables considered were quality of air and, later for water. The studies show that the effect of economic growth on quality of the environment can be categorized into three effects: (i) the scale effect (comes about due to pollution rise and environment degradation), (ii) the composition effect (shift of production structure from agriculture to industry and service) and (iii) the technique effect (decrease in pollution due to enhanced and cleaner production technology).

Dasgupta et al (2002) proposed three views about the shape of EKC, *viz.*, conventional, pessimistic and optimistic. The conventional interpretation illustrates the standard inverted U-shape. The pessimistic view suggests that a country can sustain certain level of pollution after a critical level of income. As per the optimistic view, the trade-off is not so uncompromising, and the turning point happens at lower income levels.

The EKC, however, has been seriously questioned by a research team led by Nobel prize-winning economist Kenneth Arrow, who was of the view that the "pollute first; clean up later" approach is faulty on the grounds.

Here comes the significance of sustainable development, which speaks of development with equity – equity within generation and equity across generations.

But the problem persists.

Section III: Resource Scarcity & SDGs

Sustainable development is commonly defined as "the development that meets the needs of the present, without compromising the ability of future generations to meet their own needs," as mentioned by the Brundtland Commission in its 1987 report "Our Common Future".

The three prime objectives of sustainable development are to reduce the depletion of natural resources, facilitate development without hampering the environment, and to apply environmentally friendly methods of production and consumption.

The Rio de Janeiro-Earth Summit, held in Brazil in 1992, focussing on sustainable development encouraged "the use of natural resources in a sustainable manner for environmental protection".

United Nations Conference on Sustainable Development 2012 (Rio+20) called to 'produce a set of universally applicable and acceptable' Sustainable Development Goals (SDGs) to 'balance the environmental, social and economic dimensions of sustainable development'.

The seventeen SDGs that are promoted to maintain the needs of future generations are 'No poverty (SDG 1), Zero hunger (SDG 2), Good health and well-being (SDG 3), Quality education (SDG 4), Gender equality (SDG 5), Clean water and sanitation (SDG 6), Affordable and clean energy (SDG 7), Decent work and economic growth (SDG 8), Industry, innovation and infrastructure (SDG 9), Reduced inequalities (SDG 10), Sustainable cities and communities (SDG 11), Responsible consumption and production (SDG 12), Climate action (SDG 13), Life below water (SDG 14), Life on land (SDG 15), Peace, justice, and strong institutions (SDG 16), and Partnerships for the goals (SDG 17)'.

Though all the SDGs, directly or indirectly, relate to the problem of scarcity and lead to a concern regarding the environment, however, the following specific SDGs may be identified in line with the central problems of an economy. These basic issues of an economy may be addressed by executing the following SDGs as analysed in the next paragraphs.

What to produce and in what quantity?	SDG No. 12
How to produce?	SDG No. 12, 13, 14, 15
For whom to produce?	SDG No 1,2,10
What provisions are made for future generations?	Core of SDG

The first central problem, 'what to produce and in what quantity?' can be resolved by addressing SDG 12, *i.e.*, the goal of making production and consumption with responsibility. Had there been abundance of resources, any commodity or service could have been produced in any quantity. Since resources are limited, so they are to be used optimally towards genuine and ethical consumption.

The SDG 12: 'Responsible Consumption and Production'. Consumption and production are the basic activities of all economies across the globe. With the development of human civilization, production and consumption practices have posed threat to the environment. In contrast to ever-increasing demand, limited resources are getting depleted with time, and thus, we need to think about 'what are to be produced and in what quantities' so as to ensure optimal utilization of scarce resources. To address the concern, production and consumption patterns are to be altered so as to make the earth more comfortable to live in. The need of the hour is to make production and consumption more ethical. The concept of ethical production refers to the process of producing commodities in an economically feasible way while minimizing the detrimental impacts on the environment and preserving energy and natural resources. Such a production process involves energy conservation and judicious use of natural resources, production of agricultural and/or manufacturing goods with comparative advantage, crop rotation and multiple cropping, organic farming, emission of fewer pollutants, and provision of healthy environment for workers. Further, ethical and sustainable consumerism also calls for purchase of ethically produced goods to help local artisans, small-scale manufacturers, and the protection of the environment and other life forms, encouraging the circular economy with the practice of Reduce-Recycle-Reuse, proper balance between inter-generational equity (to guarantee that every person of a society has their needs and rights fulfilled, irrespective of their gender, age, race, or other attributes) and intra-generational equity (making sure that future generations have the same opportunity as the present generation and that their needs and rights are met as its main priority), consumption of local products made up of local raw materials in line with the slogan 'Vocal for Local', and depending more on plant based diets. There is increased concern regarding making our diet more sustainable, ascertaining nutritional security with minimum environmental degradation. It is expected that such altered practices would make our production and consumption more responsible and make the process of development more sustainable.

The second central problem, 'How to produce?' relates to the choice of production techniques. Broadly, there are two production methods – labour-intensive and capital-intensive. A labour-intensive technology uses more labour as input with respect to capital, and a capital-intensive technique uses more capital with respect to labour input per unit of output. Developing countries with more working population, less accumulated capital, and less technical know-how usually opt for labour-intensive techniques, whereas developed nations with more capital and technological know-how opt for capital-intensive techniques. It is commonly understood that a more mechanised production method would generate more threats to the environment. The wastes and by-products of industrial production, which are thrown into the environment, have serious impacts on both life on land and life under water. The pollutants thrown in the environment create negative externalities and thus increase the gap between private cost and social cost of production. The increased social cost comes in terms of increased expenditure on health services, which is an economic cost incurred by individuals and the other part is the cost borne by human beings due to degradation of the environment. Thus, the central problem of choice of technique may be related to SDGs 15, 14, 13 and 12.

SDG 15 is 'Life on Land'. The goals of this SDG are to lessen and undo land degradation, reduce biodiversity loss, fight desertification, safeguard and revitalize terrestrial ecosystems, saving food systems, and sustainably manage forests. But the area of concern is that even pollution, biodiversity loss, and climate change pose a three-way threat to the environment. Expansion of agriculture is responsible for about ninety per cent of deforestation, disturbing our food systems. Thus, sustaining forest ecosystems at the global and regional levels has become crucial.

To protect the life on land, various initiatives may be taken, *e.g.* (a) recycling, (b) consuming exactly what we need, and eating a sustainably obtained, locally based diet, (c) paying sympathy towards wildlife, (d) partaking in ecotourism activities, avoiding

disturbing wildlife, (e) maintaining healthy ecosystems through good management practices, which in turn maintain human health in protected areas, (f) ensuring involvement of the local residents in the formation and management of the protected areas.

SDG 14 is 'Life below Water', the objective of which is to 'conserve and sustainably use the oceans, seas and marine resources for sustainable development'.

The ocean, occupying seventy-five per cent of the earth's surface, holds ninety-seven per cent of its water, and accounts for ninety-nine per cent of all living space by volume, is indispensable for human existence. The coastal ecosystems produce vital natural resources like food, medicine, biofuels, *etc.*, serve as the largest carbon sink on earth, and also help as buffers to resist destruction from storms. Areas of concern are high and rising marine pollution, high average pH, etc. To protect the greatest ecosystem on the globe, sustainable management calls for stepping up financing for ocean science, strengthening up conservation efforts, and reacting decisively to prevent climate change.

The life below water may be preserved and protected by (a) achieving sustainability in deep-sea and open ocean regions by intensifying international collaboration to safeguard vulnerable habitats, (b) creating networks of government-protected areas to preserve biodiversity and to ensure the capability of fishing industry, and (c) above all, changing people's attitudes about maintaining clean oceans and seas.

SDG 13 is 'Climate Action', the main area of concern. The fossil fuels like coal, oil, and gas are the basis of climate change with highly significant greenhouse gas emissions and carbon dioxide production. Greenhouse gas emissions result in climate change and global warming. The Earth is getting warmer at an accelerating rate, causing weather patterns to change, creating risk for humans and all other living beings on the Earth. Measures need to be taken to tackle adverse climate change.

Investments in renewable energy need to be increased. Measures are to be taken in all sectors to keep the rise in global temperature considerably below 2°C, or even below 1.5°C. Adoption of the Paris Agreement was the initiation to address the issue of climate change.

From the standpoint of the third central issue in any economy, namely, *For whom to produce?* SDG 1, SDG 2, and SDG 10 can be studied with the target of achieving no poverty, zero hunger and reducing inequality.

This central problem refers to the concept of the distribution of national product. Economics suggests that an even distribution of income and wealth is a must for reducing economic and social inequality. Hunger, poverty and unemployment are outcomes of uneven distribution of national product. In this connection, another issue of concern is 'Food loss and food waste'. Knowing the fact that a significant percentage of global population goes to bed without food, yet an unbelievable sizeable 931 million tons of food are wasted per year. This again calls for even distribution of income and wealth so as to remove hunger, poverty and unemployment from the planet. Thus, SDGs 1, 2 and 10 become relevant to the third central problem of every economy.

SDG 1 is 'No Poverty'. Poverty may arise due to Lack of shelter, food insecurity, social exclusion, Physical disabilities, unemployment, less or no access to health care, natural disasters, gender discrimination, and so on. Over the past few decades, there has been a notable decrease in purchasing power from the limited amount of $2.15 per person per day leading to extreme poverty. Due to COVID-19, for the first time in a generation, about 90 million more people were living in extreme poverty compared to what had been predicted. Even before the pandemic, poverty level was reducing at a slower rate. Continuation of this trend may take 7 per cent of the global population to severe poverty by 2030.

Governments, as well as the private sectors, have the power to provide the conditions necessary to produce jobs and employment opportunities for the underprivileged and marginalized in order to alleviate poverty. Providing access to clean drinking water, enhancing hygiene, and providing safe sanitation may help reduce poverty levels.

SDG 2 is 'Zero Hunger', targets to end hunger and malnutrition of all kinds. Occurrences of pandemic, war and conflict, climate change, increasing inequality, *etc*., have accelerated hunger and food insecurity alarmingly during the last decade. There has been significant rise in chronic hunger and food insecurity in recent years compared to previous periods. Extreme hunger and malnutrition stand in the way of sustainable development and create a vicious cycle from which it is difficult for individuals to escape. Consequences are lower productivity, more susceptibility to illness, malnutrition, and deterioration of living standard and income level.

Avoiding food wastage at home, workplace &community; supporting local farmers' markets and sustainable food choices; and demanding that governments and companies make the decisions and adjustments may be helpful to achieve 'Zero Hunger'.
SDG 10 *targets to* ***'reduce inequalities'***. Inequalities around the globe, be it within-country or in between-countries, has threatened long-term social and economic progress, putting in risk the poverty-reducing initiatives. The recent covid-19 pandemic has further worsened the situation. Distributing resources equitably, financing education and skill development, adopting social protection measures, reducing discrimination, alleviating marginalized groups, and promoting cooperation among countries may reduce inequality across the globe.

Necessary steps are to be taken to eradicate extreme poverty and hunger around the globe. Expenditure on social safety, health, education, and good employment, particularly for youth, immigrant and refugee populations, and other disadvantaged groups, needs to be enhanced. Inclusive social and economic prosperity is to be promoted and empowered throughout the nations. Eliminating discriminatory laws, policies, and practices help in assuring equal opportunity and lessen income disparities. Developing nations are to be fully represented in international decision-making processes so that solutions can be more efficient, reliable, and responsible.

The fourth central problem, '*What provisions are made for future generation?*', stands at the core of the SDGs. On the face of ever-increasing human wants, the problem of scarcity has become the most central problem. To make development more sustainable, the need of the hour is to alter our actions towards more environmentally friendly approaches. Thus, making provisions for future generations relates to attaining all the sustainable development goals, optimizing resource consumption without making any wastage so that future generations may inherit a better earth from this generation.

Conclusion

An economy, due to scarcity of resources, faces four central problems that need to be resolved by making choices regarding which commodities to produce and in what quantity, choosing appropriate techniques of production, making decisions about which goods to provide for which sections of society, and provisions are to be made for future generations. These basic questions led to the concept of sustainable development. At this point, the idea of 'sustainable development,' which speaks of 'development that satisfies present needs without endangering the ability of succeeding generations to adequately meet their own needs', becomes significant. Thus, it is well understood that economics of scarcity and the philosophy of sustainable development are two facets of the same coin. The concepts go hand in hand. There have been serious efforts by the global leaders to start action in this regard. Countries across the globe have made provisions to initiate the execution of the goals. However, the efforts are to be made at the micro level. Every individual has to make conscious efforts to protect the environment to make the Earth a better place to live.

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