Sustainable Development And Environmental Accounting

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I. INTRODUCTION

Change in climate has been scientifically categorized as a serious threat facing humanity by independent world bodies such as the International Energy agency (IEA), Millennium Ecosystem Assessment (MEA) and the Intergovernmental Panel on Climate Change (IPCC). Such a situation has been reached due to Green-House Gas(GHG) emissions through various anthropogenic activities over the year around the world. In fact, the negative impact of climate change resource scarcity and related effects will be pronounced for India considering its population density, large shore line and other features relevant to the well-being of its citizens.

Development process, over the year, has remained largely focused on raising the rate of growth of gross domestic product (GDP) with the objective of increasing the availability of goods and services to the people for improving their living standards. In pursuits of this objective of achieving higher rates of growth of GDP, new technologies have been used for more extensive exploitation of natural resources such as mines[1], forests, land,water,etc. Not much care has been taken to ensure that these resources should remain available to the future generations, at least as much in quantity and quality, as are being used by the present generation. The consequences of this reckless exploitation of natural resources have, over time, manifested themselves in the shape of degraded land fertility,decline of forest area, contamination of water bodies and pollution of atmosphere[1-5]. These developments have not only adversely affected the health efficiency and productivity of the present generation, but also threatened the process of future growth due to lesser availability of natural resources in the shape of degraded and infertile lands, drying oil fields, empty mines, polluted air and contaminated water sources to be worked upon by sack, unhealthy, ailing and inefficient persons. This implies that the current tempo of economic growth is likely to suffer and become unsustainable in future. Therefore, there is an urgent need to insure the current tempo of development is maintained in future as well. This is possible only when a nation makes a judicious use of its natural resources, keeping in mind interest of not only the present generation, but also of the generations to come. Need for preservation of environment replenishment and augmentation of natural resources for use in future make it obligatory that environmental issues are given due attention in development policies. This concern for environment and future generations forms the core content of the policy for sustainable development[6].

II. SUSTAINABLE DEVELOPMENT

All economic activities either affect or are affected by natural and environmental resources[7]. Development based on intense utilization of natural resources and polluting industrial technology are bound to adversely affect our natural and environmental assets over the time, resulting in reduced productivity of the economic system and loss of welfare of the future inhabitants of this planet. There is a growing concern about how to minimize the impact of human activities on the environment. Already nowadays, in some places adaptation efforts are needed in order to avoid the irreversibility of negative human activities [7].Economic development without environmental considerations can cause serious environmental damage, which in turn, is bound to impair the quality of life of the present as well as the future generations.Sustainable development attempts to strike a balance between the demands of economic development and the need for protection of natural and environmental assets. Different studies have been undertaken to study the sustainability of the resources [8-15]. It seeks to ensure that the coming generation do not suffer due to excessive exploitation of natural resources by the present people.Sustainable development, thus, attempts to accelerate development in an environmentally responsible manner keeping in mind the intergenerational equityproviding a fair share of natural resources for the future generation to meet their requirements.

III. WHAT MAKES DEVELOPMENT UNSUSTAINABLE

Economic development seeks to increase the rate at which national income (Gross national product, GNP) is

increasing and achieve redistribution of income in the favour of poor, or weaker section of society. Different researches studied the impact of GNP on health and industries [16;17]. Increase in GNP results from increased productions in various economic sectors, such as industry, agriculture, mining, etc. The process of increase in output involves greater use of resources, such as land, forests, mines, fuels, raw material and power,whose supply is essentially limited. Excessive use of these limited resources may lead to their depletion, degradation and even exhaustion. Thus, production process may check the following

a. Use of resources which are non-renewable which will exhaust after some time as their stock came be replenished. Such resources include fuels such as petroleum, coal, etc. whose global supplies may be essentially limited to last only for a few decades or more.
b. Use of resources which may be renewable, but whose supplies cannot be replenished at the rate at which their depletion takes place. Such resources include vegetation and forest, soil fertility, etc.
c. Use of technology that pollutes atmosphere and water bodies such as rivers and lakes and thus endanger human existence. Industrial wastes pollute the rivers, smoke and chemicals emitted from industries and motor vehicles pollute air and thus endanger life on the planet

Thus, in the race for development, output is sought to be increased through rapid depletion of resources under unhealthy environmental conditions by the present generation. By doing so we may be handing down to the future generations made depleted resources to produce output under polluted environmental conditions that adversely affect their health and efficiency. Thus, they shall not be able to produce as much output as the present generations is producing and therefore, the rate of economic development in future is bound to fall. In other words, since we are producing more at the cost of future generations, the present level of development is not sustainable, i.e., it cannot be maintained in future.

IV. ENVIRONMENTAL ACCOUNTING

Programs of economic development and pursuit of high growth rate of national income involve extensive use and exploitation of economic resources such as manpower, materials, machinery, natural resources, etc. In this process of reckless resources utilization to achieve high growth rate of output and income, environmental gets adversely affected. Damage to soil fertility, water quality, forest cover as well as the overall environmental degradation caused by modern technology and latest equipment to achieve higher productivity and large output at present have adverse impact on long-term productivity and output in growth in future. Such long-run adverse consequences of environmental damage are environmental costs of economic development.

Environmental accounting means that these environmental costs must be accounted for and treated as integral part of producing the current level of GNP. Various research papers reveal the importance of environmental accounting in the field of resource management [18-22]. To account for the environmental cost, some money value must be put on the damage to environmental resources. This could be in the form of estimated expenditure required for replenishing these depleted natural resources as well as the expenses on preservation of natural resources and preventing environmental damage through such measure as control of air and water pollution, treatment of soil to regain fertility, afforestation to maintain the forest cover, etc. All such environmental costs must be treated as costs of GNP on a par with other cost of men and materials. Environmental accounting, thus, involves estimating the Environmental costs of programs of economic development and treating these costs in the same way as the costs of other resources used in development projects. Therefore, for any sustainable development policy, it is necessary that all environmental costs are properly accounted for and duly considered.

V. ENVIRONMENTAL ACCOUNTING AND SUSTAINABLE DEVELOPMENT

The word ‘sustainable’ in the context of sustainable development means the need to preserve abalance between economic growth and environmental preservation.

This sustainability can be maintained if we pass on to the next generations at least as much as (if not more) of productive resources we make use of in our current economic activity. The productive resources can be broadly classified as follows

a. Man-made capital assets such as machinery, equipment, tools and instruments
b. Human capital (Human skills, knowledge and capabilities)
c. Natural capital or environmental assets such as such as forests, soil quality, air and water

Development would become sustainable only when we ensure that this overall asset position does not deplete in the process of production and increased tempo of economic

activity. Among these assets natural or environmental assets are most vulnerable and largely non- renewable. While we can build more machines to replenish worn-out stock or train more people to build up skills, we cannot create more land or water bodies, we cannot easily replenish our dwindling forests, we cannot clean atmosphere in a short span of time. Thus, natural resources or environmental assets need to be handled with utmost care to ensure that development becomes sustainable.

VI. GNP INCREASE IS NOT THE TRUE MEASURE OF DEVELOPMENT

GNP, which is commonly accepted as a country's measure of economic progress and welfare, fails to reflect the true cost of development in the form of depletion of natural resources and environmental changes. Thus, for example, cutting down of trees for commercial use of timber would add to the value of GNP, but would nowhere be counted as a loss of natural assets or depletion of natural forests resources. However, the fact remains that more output we produce today by using larger quantities of natural resources, the greater is the loss of our natural assets and the lower is the output that the future generations will be able to produce with these depleted resources. R.K. Pachauri, the former Chairman, Intergovernmental Panel on Climate Change said,"In essence, every time we produce goods and services by depleting national resources, we are borrowing wealth of our children and accounting for it as riches created today."

Thus,in order to achieve sustainable development, economic policies and programs must take into account, apart from material or economic factors, such important issues as preservation of natural resources, environmental considerations and social concerns.To make development sustainable, therefore, it is necessary to introduce environmental accounting in our development programs. The nation must keep account of the natural resources it uses in its current economic activity and make suitable provisions in its laws and policies to replenish and hand over to the next generations an equal quantum of these natural resources for use in future.

VII. GREEN NNP

Net national product (NNP) is equal to GNP minus depreciation of physical assets or man-made capital (D_m). But this NNP may not be sustainable if we do not account for the use of the natural assets and take suitable measures to replenish these assets. Thus, NNP is not the amount of goods and services available for consumption. Adjustment must also be made for depreciation of natural capital. Hence, the sustainable level of national product is one which allows for both depreciations of man-made capital and natural capital. Thus,

$$NNP^* = GNP- D_m- D_n$$

Where NNP^* is the sustainable national income, $D_m$is the depreciation of man-made (manufactured) capital and D_n is the depreciation of environmental capital, i.e., the money value of environmental decay in a year. Sustainable level of national income or NNP^* is also called green NNP.Some environmentalists would like not only to account for depreciation of environmental capital, but also deduct from GNP the cost of restoration of degraded or damaged environmental assets (forests, fishers, water bodies, land improvements, etc.) as well as the expense required to be made on averting loss of environmental capital (such as expenditure on pollution control measures and preservation of water and soil quality).

VIII. CONCLUSION AND RECOMMENDATIONS

Environmental protection is linked to sustainable development as damaged environment and depleted natural resources are bound to adversely affect the output, income, consumption standards and quality of life of the future generations. Thus, while formulating a development policy, we have to strike a balance between these requirements of the present and needs of the future generations. For this, we must make an efficient use of natural resources, economize on the use of non –renewable resources, develop, discover and use renewable resources and try to replenish the stop of resources at least to the extent that the present level of development depletes them. We should use a technology that does not pollute atmosphere, reduce the level of water and atmospheric pollution, increase vegetation and forests, minimize use of chemicals in agriculture and thus, take all such steps by which we hand over to the future generations a safe and healthy place to live, produce and spend a better quality life. Reckless Damage of environment in the race for economic growth has now given rise to fears that limits may be crossed where both present and the future needs may become difficult to be met.
Some of the measures that the underdeveloped countries must adopt to protect environmental degradation and promote sustainable development are discussed below

a. Use of Non-Conventional Energy Sources

The conventional energy sources, viz., petroleum oil, coal, thermal power, firewood, cowdung cakes, etc., are either polluting or exhaustible. Therefore, to minimize pollution, the non-commercial energy sources, viz. coal, oil, power, etc., should be replaced by non-polluting renewable energy sources

like solar power, wind energy as far as possible. Clean energy sources like biogas, liquefied petroleum gas (LPG) should be used for domestic purposes in villages. Similarly, the domestic use of LPG, CNG must be encouraged for domestic users and as fuel for transport vehicles in the cities. This will preserve air quality, cause less pollution and save oil and coal which are exhaustible energy sources.

b. Organic Farming

With the onset of Green Revolution, more and more farmers have taken up the use of chemical fertilizers and pesticides. The farmers should be encouraged to undertake organic farming method that use compose manure and biopest control. It is well known that chemical fertilizers erode the fertility of the soil and pesticides enter in to food chain to cause harm to the consumers. The run-off water that is full of these chemicals pollutes water sources. Thus organic farming and biopest control methods are eco-friendly and do not damage environment. They, in fact, help in improving the soil quality and are good for long-term growth of agriculture.

c. Setting up Mini-Hydel Power Plants and Wind Power Projects

The huge multipurpose irrigation projects the dams that are used to store water, the canals used for irrigation, etc., are not so eco-friendly. The water reservoir behind the dams inundate many areas and the canals cause slush in areas around them. Moreover such big intervention with the free flow of the mighty rivers proved to cause some natural disasters. Therefore, it is suggested that mini-hydroprojects should be built on small streams and rivulets to rotate small turbines for producing power for local needs. Similarly, in those areas where wind flow is substantially higher wind turbines should be set up to generate electricity.

d. Use of Solar Power

Solar energy has now emerged as a good means of meeting energy requirements. Solar panels are installed on the roofs of many buildings which produce enough power for internal heating of the buildings in winter, provide hot water, thus dispensing with the need for air-conditions and heaters. Solar cookers are a good device for cooking healthy food without use of any traditional energy sources. Developments in this area of solar power are encouraging. And surely solar energy can be used to supplement traditional power sources and thus make condition to environmental protection.

e. Imposing Taxes or Fee on Use of Natural Resources

The government should impose cost on the users of freely available natural resources in the form of fee or taxes. The proposal to tax on use of groundwater in Delhi is one such steps. This would increase the cost to the users and thus prevent over exploitation of natural resources.

f. Replenishment of Natural Resources

Efforts should be made to replenish renewable resources such as forests and water resources. Efforts at afforestation and harvesting of rain water for raising water level are the right steps in this direction.

g. Reduction in Pollution Levels

To achieve the goal of reduction in pollution levels to safe limits, emission and effluent standards for air, water and sound have been fixed and notified. Regular monitoring is carried out and offenders are being punished. Polluting industries have been moved out from mega cities and pollution control equipment installed in those industries which are eligible for operating in the city limits. Vehicular emission norms have been further raised and cleaner fuels have been introduced. Best available, clean and practicable technologies are being popularized for achieving a pollution-free environment.

These policy measures, if implemented strictly and efficiently, can help in ensuring that the future generations do not suffer from the depleted natural resources and polluted environment caused by the reckless exploitation of resources by the present generation in its greed for more output and better living conditions for itself.

REFERENCES

[1] Li G, Lei Y, Ge J, Wu S: The Empirical Relationship between Mining Industry Development and Environmental Pollution in China. Int J Environ Res Public Health 2017;14(3). pii: E254. doi: 10.3390/ijerph14030254.

[2] Kamimura A, Armenta B, Nourian M, Assasnik N, Nourian K, Chernenko A: Perceived Environmental Pollution and Its Impact on Health in China, Japan, and South Korea. J Prev Med Public Health 2017;50:188-194.

[3] Bauerova P, Vinklerova J, Hranicek J, Corba V, Vojtek L, Svobodova J, Vinkler M: Associations of urban environmental pollution with health-related physiological

traits in a free-living bird species. Sci Total Environ 2017;601-602:1556-1565.

[4] Alshahri F: Heavy metal contamination in sand and sediments near to disposal site of reject brine from desalination plant, Arabian Gulf: Assessment of environmental pollution. Environ Sci Pollut Res Int 2017;24:1821-1831.

[5] Saxena G, Chandra R, Bharagava RN: Environmental Pollution, Toxicity Profile and Treatment Approaches for Tannery Wastewater and Its Chemical Pollutants. Rev Environ Contam Toxicol 2017;240:31-69.

[6] Marmot M, Bell R: The Sustainable Development Goals and Health Equity. Epidemiology 2017.doi: 10.1097/EDE.0000000000000773. [Epub ahead of print]

[7] Mikulcic H, Duic N, Dewil R: Environmental management as a pillar for sustainable development. J Environ Manage 2017;203:867-871.

[8] Melaku YA, Shi Z: Lessons for the Sustainable Development Goals from Ethiopia's success: the case of under-5 mortality. Lancet Glob Health 2017;5:e1060-e1061.

[9] Helbing D, Seele P: Sustainable development: Turn war rooms into peace rooms. Nature 2017;549:458.

[10] Giles-Corti B, Kerr J, Pratt M: Contributing to helping to achieve the UN Sustainable Development Goals: Truly shifting from niche to norm. Prev Med 2017.doi: 10.1016/j.ypmed.2017.08.021. [Epub ahead of print]

[11] Timmis K, de Vos WM, Ramos JL, Vlaeminck SE, Prieto A, Danchin A, Verstraete W, de L, V, Lee SY, Brussow H, Timmis JK, Singh BK: The contribution of microbial biotechnology to sustainable development goals. Microb Biotechnol 2017;10:984-987.

[12] Stauber C: The Sustainable Development Goals for Water: The Need to Consider Perception, Preference, and Safety. Am J Trop Med Hyg 2017;97:985-986.

[13] Beguin P, Duarte F: Work and Sustainable Development. Work 2017;57:311-313.

[14] Kickbusch I, Hanefeld J: Role for academic institutions and think tanks in speeding progress on sustainable development goals. BMJ 2017;358:j3519.

[15] Tan Q, Li J: Sustainable development: Manage chemicals and waste globally. Nature 2017;547:162.

[16] Fuchs VR: The health sector's share of the gross national product. Science 1990;247:534-538.

[17] Ma X: Industrial population, gross national product and growth of cities and towns. Soc Sci China 1988;78-89.

[18] Smith TM, Goodkind AL, Kim T, Pelton REO, Suh K, Schmitt J: Subnational mobility and consumption-based environmental accounting of US corn in animal protein and ethanol supply chains. Proc Natl Acad Sci U S A 2017;114:E7891-E7899.

[19] Leach AW, Mumford JD: Pesticide Environmental Accounting: a method for assessing the external costs of individual pesticide applications. Environ Pollut 2008;151:139-147.

[20] Lomas PL, Alvarez S, Rodriguez M, Montes C: Environmental accounting as a management tool in the Mediterranean context: the Spanish economy during the last 20 years. J Environ Manage 2008;88:326-347.

[21] Simone B, Marchettini N, Niccolucci V, Pulselli FM: Environmental accounting for the lagoon of Venice and the case of fishing. Ann Chim 2005;95:143-152.

[22] Clauson-Kaas J, Poulsen TS, Jacobsen BN, Guildal T, Wenzel H: Environmental accounting--a decision support tool in WWTP operation and management. Water Sci Technol 2001;44:25-30.