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Sustainable development

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Abstract
Sustainable development (SD) is a process for meeting human development goals while sustaining the ability of natural systems to continue to provide the natural resources and ecosystem services upon which the economy and society depend. While the modern concept of sustainable development is derived most strongly from the 1987 Brundtland Report, it is rooted in earlier ideas about sustainable forest management and twentieth century environmental concerns.
Sustainable development is the organizing principle for sustaining finite resources necessary to provide for the needs of future generations of life on the planet. It is a process that envisions a desirable future state for human societies in which living conditions and resource-use continue to meet human needs without undermining the "integrity, stability and beauty" of natural biotic systems. The main objectives are Efficient Use of Natural Resources, No Reduction in the Quality of Life of the Future Generation, No Increase in Pollution. In 1992, the UN Conference on Environment and Development published in 1992 the Earth Charter, which outlines the building of a just, sustainable, and peaceful global society in the 21st century. The action plan Agenda 21 for sustainable development identified information, integration, and participation as key building blocks to help countries achieve development that recognizes these interdependent pillars. It emphasizes that in sustainable development everyone is a user and provider of information. An unsustainable situation occurs when natural capital (the sum total of nature's resources) is used up faster than it can be replenished. Sustainability requires that human activity only uses nature's resources at a rate at which they can be replenished naturally. Inherently the concept of sustainable development is intertwined with the concept of carrying capacity. Economic development has traditionally required a growth in the gross domestic product. This model of unlimited personal and GDP growth may be over. Sustainable development may involve improvements in the quality of life for many but may necessitate a decrease in resource consumption.

Keywords: Sustainable development, Energy, Energy

Introduction
Almost all economies of the world are actively engaged in their economic progress. Economic advancement is of utmost to all the economies. Economic advancement is a must for underdeveloped countries like India because in it lies the solution of the problems like, poverty, unemployment, backwardness and low standard of living. It is equally important for developed economies like America because by it they intend to maintain the level of their existing economic prosperity for a long period.

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Definition
In words of Robbert Repetto, “Sustainable Development is a development strategy that manages all natural resources and human resources as well as financial and physical assets for increasing long term wealth and well-being”

Objectives of sustainable development
Efficient Use of Natural Resources
No Reduction in the Quality of Life of the Future Generation
No Increase in Pollution
Does not Delimit the concept of Development
Distributional Equity

Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two key concepts:
The concept of 'needs', in particular, the essential needs of the world's poor, to which overriding priority should be given; and The idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs.

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development everyone is a user and provider of information. It stresses the need to change from old sector-centered ways of doing business to new approaches that involve cross-sectoral co-ordination and the integration of environmental and social concerns into all development processes. Furthermore, Agenda 21 emphasises that broad public participation in decision making is a fundamental prerequisite for achieving sustainable development. Under the principles of the United Nations Charter the Millennium Declaration identified principles and treaties on sustainable development, including economic development, social development and environmental protection. Broadly defined, sustainable development is a systems approach to growth and development and to manage natural, produced, and social capital for the welfare of their own and future generations. The term sustainable development as used by the United Nations incorporates both issues associated with land development and broader issues of human development such as education, public health, and standard of living.

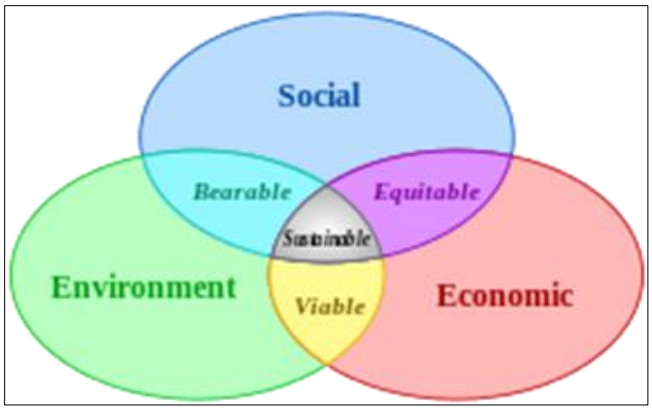

Fig 1: Scheme of sustainable development: at the confluence of three constituent parts. (2006)

Sustainable development has been described in terms of three dimensions, domains or pillars. In the three-dimension model, these are seen as "economic, environmental and social" or "ecology, economy and equity"; this has been expanded by some authors to include a fourth pillar of culture, institutions or governance.

The ecological sustainability of human settlements is part of the relationship between humans and their natural, social and built environments. Also termed human ecology, this broadens the focus of sustainable development to include the domain of human health. Fundamental human needs such as the availability and quality of air, water, food and shelter are also the ecological foundations for sustainable development addressing public health risk through investments in ecosystem services can be a powerful and transformative force for sustainable development which, in this sense, extends to all species.

Agriculture

Sustainable agriculture

Sustainable agriculture consists of environmentally-friendly methods of farming that allow the production of crops or livestock without damage to human or natural systems. It involves preventing adverse effects to soil, water, biodiversity, surrounding or downstream resources—as well as to those working or living on the farm or in neighboring areas. The concept of sustainable agriculture extends intergenerationally, passing on a conserved or improved natural resource, biotic, and economic base rather than one which has been depleted or pollute. Elements of sustainable agriculture include permaculture, agroforestry, mixed farming, multiple cropping, and crop rotation.

Numerous sustainability standards and certification systems have been established in recent years, offering consumer choices for sustainable agriculture practices. These include Organic certification, Rainforest Alliance, Fair Trade, UTZ Certified, Bird Friendly, and the Common Code for the Coffee Community (4C).

Energy

Sustainable energy is the sustainable provision of energy that is clean and lasts for a long period of time. Unlike the fossil fuel that most of the countries are using, renewable energy only produces little or even no pollution. The most common types of renewable energy in US are solar and wind energy, solar energy are commonly used on public parking meter, street lights and the roof of buildings. Wind energy has expanded quickly, generating 12,000 MW in 2013. The largest wind power station is in Texas and California. Household energy consumption can also be improved in a sustainable way, like using electronics with Energy Star logos which conserve water and energy. Most of California's fossil fuel infrastructures are sited in or near low-income communities, and have traditionally suffered the most from California's fossil fuel energy system. These communities are historically left out during the decision-making process, and often end up with dirty power plants and other dirty energy projects that poison the air and harm the area. These toxins are major contributors to health problems in the communities. As renewable energy becomes more common, fossil fuel infrastructures is replaced by renewables, providing better social equity to these community.

Environment

Environmental sustainability concerns the natural environment and how it endures and remains diverse and productive. Since natural resources are derived from the environment, the state of air, water, and the climate are of particular concern. The IPCC Fifth Assessment Report outlines current knowledge about scientific, technical and socio-economic information concerning climate change, and lists options for adaptation and mitigation. Environmental sustainability requires society to design activities to meet human needs while preserving the life support systems of the planet. This, for example, entails using water sustainably, utilizing renewable energy, and sustainable material supplies (e.g. harvesting wood from forests at a rate that maintains the biomass and biodiversity).

An unsustainable situation occurs when natural capital (the sum total of nature's resources) is used up faster than it can be replenished. Sustainability requires that human activity only uses nature's resources at a rate at which they can be replenished naturally. Inherently the concept of sustainable development is intertwined with the concept of carrying capacity. Theoretically, the long-term result of environmental degradation is the inability toIf the degradation continues beyond a certain tipping point or critical threshold it would lead to eventual extinction for humanity. sustain human life. Such degradation on a global scale should imply an increase in human death rate until population falls to what the degraded environment can support.

Table 1

Consumption of renewable resources	State of environment	Sustainability
More than nature's ability to replenish	Environmental degradation	Not sustainable
Equal to nature's ability to replenish	Environmental equilibrium	Steady state economy
Less than nature's ability to replenish	Environmental renewal	Environmentally sustainable

Economics

It has been suggested that because of rural poverty and overexploitation, environmental resources should be treated as important economic assets, called natural capital. Economic development has traditionally required a growth in the gross domestic product. This model of unlimited personal and GDP growth may be over. Sustainable development may involve improvements in the quality of life for many but may necessitate a decrease in resource consumption. According to ecological economist Malte Faber, ecological economics is defined by its focus on nature, justice, and time. Issues of intergenerational equity, irreversibility of environmental change, uncertainty of long-term outcomes, and sustainable development guide ecological economic analysis and valuation.

As early as the 1970s, the concept of sustainability was used to describe an economy "in equilibrium with basic ecological support systems." Scientists in many fields have highlighted *The Limits to Growth*, and economists have presented alternatives, for example a 'steady state economy'; to address concerns over the impacts of expanding human development on the planet. In 1987 the economist Edward Barbier published the study *The Concept of Sustainable Economic Development*, where he recognized that goals of environmental conservation and economic development are not conflicting and can be reinforcing each other.

A World Bank study from 1999 concluded that based on the theory of genuine savings, policymakers have many possible interventions to increase sustainability, in macroeconomics or purely environmental. A study from 2001 noted that efficient policies for renewable energy and pollution are compatible with increasing human welfare, eventually reaching a golden-rule steady state. The study, *Interpreting Sustainability in Economic Terms*, found three pillars of sustainable development, interlinkage, intergenerational equity, and dynamic efficiency.

A meta review in 2002 looked at environmental and economic valuations and found a lack of "sustainability policies". A study in 2004 asked if we consume too much.A study concluded in 2007 that knowledge, manufactured and human capital (health and education) has not compensated for the degradation of natural capital in many parts of the world. It has been suggested that intergenerational equity can be incorporated into a sustainable development and decision making, as has become common in economic valuations of climate economics. A meta review in 2009 identified conditions for a strong case to act on climate change, and called for more work to fully account of the relevant economics and how it affects human welfare. According to John Baden "the improvement of environment quality depends on the market economy and the existence of legitimate and protected property rights." They enable the effective practice of personal responsibility and the development of mechanisms to protect the environment. The State can in this context "create conditions which encourage the people to save the environment."

Business

The most broadly accepted criterion for corporate sustainability constitutes a firm's efficient use of natural capital. This eco-efficiency is usually calculated as the economic value added by a firm in relation to its aggregated ecological impact. This idea has been popularised by the World Business Council for Sustainable Development (WBCSD) under the following definition: "Eco-efficiency is achieved by the delivery of competitively priced goods and services that satisfy human needs and bring quality of life, while progressively reducing ecological impacts and resource intensity throughout the life-cycle to a level at least in line with the earth's carrying capacity."

Similar to the eco-efficiency concept but so far less explored is the second criterion for corporate sustainability. Socio-efficiency describes the relation between a firm's value added and its social impact. Whereas, it can be assumed that most corporate impacts on the environment are negative (apart from rare exceptions such as the planting of trees) this is not true for social impacts. These can be either positive (e.g. corporate giving, creation of employment) or negative (e.g. work accidents, mobbing of employees, human rights abuses). Depending on the type of impact socio-efficiency thus either tries to minimize negative social impacts (i.e. accidents per value added) or maximise positive social impacts (i.e. donations per value added) in relation to the value added.

Both eco-efficiency and socio-efficiency are concerned primarily with increasing economic sustainability. In this process they instrumentalize both natural and social capital aiming to benefit from win-win situations. However, as Dyllick and Hockerts point out the business case alone will not be sufficient to realise sustainable development. They point towards eco-effectiveness, socio-effectiveness, sufficiency, and eco-equity as four criteria that need to be met if sustainable development is to be reached.

Income

At the present time, sustainable development as well as solidarity or Catholic social teaching can impact reduce the poverty. Because over many thousands of years the 'stronger' (economically or physically) used to defeat/eliminate the weaker, nowadays, no matter what we call the reason for this decision – within Catholic social teaching, social solidarity, and sustainable development – the stronger helps the weaker. This aid may take the form of in-kind or material, refer to the present or the future. 'The Stronger', should offer real help and not, as demonstrated by the frequent experience – strive for the elimination or annihilation of another entity. Sustainable development reduce poverty through economic (among other things, a balanced budget), environmental (living conditions) and also social (including equality of income) dimensions.

Conclusion

Sustainable development is largly about people, their well-being and equity in their relationship with each other. The most serious issues for Sustainable development associated with climate-change impacts on the subjects of this chapterare (a) threats to vulnerable regions and localities from gradual ecological changes leading to impact threshold and extreme events that could disrupt the Sustainablity of socities and cultures, (b) threats to fragile social and environmental system. As a very general rule, senstivites of

more developed countries to the implications of climate-change are less than in developing economies but effects of crossing thresholds of sustainabllity could be especially large in developed economies. This study concluded that social indicators and, therefore, sustainable development indicators, are scientific constructs whose principal objective is to inform public policy-making. The International Institute for Sustainable Development has similarly developed a political policy framework, linked to a sustainability index for establishing measurable entities and metrics. The framework consists of six core areas, international trade and investment, economic policy, climate change and energy, measurement and assessment, natural resource management, and the role of communication technologies in sustainable development.

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