

# INTERNATIONAL JOURNAL OF RESEARCH IN COMPUTER APPLICATION & MANAGEMENT

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## WHAT DOES SUSTAINABLE DEVELOPMENT REALLY MEANS? - A STUDY ON DIFFERENT DIMENSIONS OF SUSTAINABILITY

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### ABSTRACT

*Sustainable Development, although a widely used phrase, is a contested concept. In a wider sense, it is an attempt to combine growing concerns about environmental issues with socio economic issues of development. Sustainable development, while maintaining a sound economic base, must remedy social inequities and environmental damages. To have a clear understanding of the plurality of opinion and policies, this paper present a classification of different perspectives of sustainable development. This paper also stresses the need to adapt the existing institutions of all kind, including corporations, local and national governments, and transnational organisations to the requirement of sustainable development.*

### KEYWORDS

Environmental issues of development, Institutional requirement for sustainability, Intergenerational equity, Social component of sustainability, Sound economic base.

### 1.1. INTRODUCTION

During 19<sup>th</sup> and early 20<sup>th</sup> century, the imperial and colonial power dominated the world, gave little provision for economic and social advancement in what we now call the developing world. Imperial power utilised colonial region for raw material and cheap labour. By the end of Second World War policy had changed drastically. Economic and social improvement of the majority had become a major objective of the governments. With the crumbling of colonial power relations, this goal was extended to poorer nations. W.W. Rostow's concept "mass consumption" was widely accepted as the end goal of economic development. The less developed nations have started the initiatives to "take off" the economy from "traditional society" to "maturity" and to "high mass consumption". The primary goal of economic policy was to raise the living standard by providing more goods and services to an expanding population. After the Second World War IMF, World Bank and United Nations were specifically designed with this goal.

Meanwhile different approaches of development have been emphasized at different times. Original emphasis was on promoting agricultural and industrial production. In late 1970's emphasis was promoting education, nutrition, health, sanitation and employment of the poor. It inspired the creation of United Nation's Development Program's "Human Development Index (HDI)". The HDI combines "life expectancy, adult literacy and school enrolment ratio, with percapita GDP in a weighted average to get an index between "0" and "1". The HDI clearly shows that development is a multi-dimensional process. Higher GDP does not necessarily mean higher overall welfare.

Since 1980's the focus shifted to "structural adjustments" including "liberalisation of trade," elimination of government deficit and overhauled exchange rates", and "dismantling inefficient parastatal organisations". The new market oriented structural adjustment measures were viewed as a measure to correct the errors of the earlier government centered development policies. The market oriented measures, even though it resulted in improved economic efficiency, often lead to greater in equality and hardship for the poor. In the present decade, even though there have been areas of slow or negative growth especially in Africa, globally most countries have made significant advance both in GDP and in HDI measures.

Even in the context of improvement in GDP and in HDI, overall development on a world scale is open to two major criticisms:

- The benefits of development have distributed unevenly between rich and poor nations and between rich and poor groups in individual nation. The global number of extremely poor and under nourished have remained high and in some societies it has increased.
- The other major negative impact of development has been on the environment and on existing social structure. Many traditional societies have been devastated by development of forest, water system and intense of fisheries. Environmental damage of development, if unchecked, may undermine the achievement of development and even collapse of essential ecosystem.

The growing awareness of these challenges to traditional development thinking has led to the increasing acceptance of a new concept of development, sustainable development.

### 1.2. SUSTAINABLE DEVELOPMENT

As defined by World Commission on Environment and Development in 1987, sustainable development means the development which meets needs of the present without compromising the ability of future generations to meet their own needs. In the extensive discussion of the concept of sustainable development since then, there has been recognition of three aspects of sustainable development: economic, environment and social.

An economically sustainable system must be able to produce goods and services on a continuing basis to maintain manageable levels of government's internal and external debt and to avoid unhealthy sectorial imbalance which damage agriculture or industrial production. An environmentally sustainable system must maintain a stable resource base avoiding over exploitation of renewable resource system and depleting nonrenewable resources only to the extent that investment is made in adequate substitutes. It includes maintenance of bio diversity, atmospheric stability, and other ecosystem functions. A socially sustainable system must achieve distributional equity, adequate provision of social services including education and health, gender equity, and political accountability and participation.

These three elements of sustainable development raise the issue of how to balance objective and how to judge success or failure. For example, provision of adequate food and water supplies require changes which will decrease biodiversity. Nonpolluting energy sources are more expensive, thus increasing burden on the poor. Nonetheless, these three principles satisfy the criteria for sustainability and if we could move closer to achieving these three goals, the world would be a better place. Certainly these goals require insights of multidiscipline and therefore required to analyse in the perspective of economists' ecologists', and social scientists'.

### 2.1. ECONOMIC PERSPECTIVE OF SUSTAINABILITY

From the point of view of neoclassical economic theory, sustainability can be defined in terms of maximisation of human welfare over time. Maximisation of welfare can be identified as maximisation of utility derived from consumption. Of course, it includes the utility derived from the consumption of food, clothing, housing, transportation, health, education etc. For analytical simplicity, all these can be reduced to a measurable single dimensional indicator. According to standard economic theory, efficient resource allocation should have the effect of maximizing utility from consumption. If we accept this, sustainability appears to mean nothing more than efficient resource allocation. Now the question arises is efficient allocation among generations. When we consider issues such as soil erosion and building up of greenhouse gases, the most damaging impact are felt over generations. Thus to achieve intergenerational equity we must impose some kind of sustainability rule regarding resource use and environmental impact.

A related issue concerns the concept of natural capital, which consists of soil and atmospheric functions including natural resources and environmental services of the planet. Sustainable development can be operationalized in terms of the conservation of natural capital. This policy goal lead to two decision rule, one for renewable and the other for nonrenewable resources. The rule for renewable resource use is to limit the resource consumption to sustainable yield level and for nonrenewable the rule is to reinvest the proceeds from nonrenewable resource exploitation in to investment in renewable natural capital. Following these two rules will maintain a constant stock of natural capital.

The sustainability decision rule for natural capital is quite different from the standard neo classical approach which assumes substitutability of manmade and natural capital. It is in contrast to the assumption of the decision rule, manmade and natural capital is fundamentally complements and marginally substitutes. If natural capital has a special and unique importance then the so called neo classical economic efficiency will not suffice for sustainability.

The issue can be resolved by recognizing that some issue can be appropriately dealt with through neoclassical market efficiency while others require application of a "safe minimum standard" approach to protect essential resources and environmental functions. The concept of safe minimum standard can be applied to concerns about intergenerational fairness, resource constraints and human impact. The role of public decision making and the formation of social values are central to the safe minimum standards. In order to explore further implications of this approach we need to examine the ecological and social dimensions of sustainability.

## 2.2. ECOLOGICAL PERSPECTIVE OF SUSTAINABILITY

In an ecological perspective, sustainability must involve limits on population and consumption levels, whereas economic models provide no upper bound on economic growth. The limits apply to all biological system. While human may appear to evade them for a time, they must ultimately accept the boundaries of a finite planet. Humans consume a lion share of the basic energy supply for all terrestrial animals. A further growth in percapita consumption would lead little room for any other species on the planet.

Another important aspect of ecologists' view on sustainability is the generation of generic diversity and the resultant process of evolution and change in species and ecosystem. Generic diversity gives rise to resilience in ecosystem. Resilience is a bounce back capacity which enables a system to respond to disturbance or damage. For example, a forest ecosystem may recover from a pest infestation through an increase in the population of predators which control the pest, an expansion of species unaffected by the pest, and possibly a development of pest resistance in affected species. The patterns of response will be widely variable, but the essential integrity of the ecosystem will be preserved. The key to resilience is the existence of a wide variety of species, interacting with each other and providing a reservoir of genetic forms which provide the potential to adapt to changing conditions.

Thus, for the ecologists, sustainability should be defined in terms of maintenance of ecosystem resilience. This view of sustainability is clearly different from the human centered conception put forwarded by World Commission on Environment and Development and the consumption based principles proposed by economic theorists. It implies that there may be no close relationship between economic sustainability and ecological sustainability. The importance of the ecological perspective is increasingly evident, as more of the critical problems facing humanity arise from failures of ecological resilience. The resurgence of diseases due to the development of antibiotic resistance, the disruption of ecosystems by introduced species, the formation of "dead zones" in coastal waters, and the multiple ecological threats related to climate change and increased climate volatility, all testify to the impacts of expanding human economic activity.

Therefore, sustainability is more than limits on population or restraint in consumption, though these are important. It means that in our choice of goods and technologies we must orient to the requirements of ecosystem integrity and species diversity. It also implies that an integration of economics and ecology is required and this can only be achieved with the assistance of the third element of the sustainability trial – the social perspective.

## 2.3. SOCIAL PERSPECTIVE OF SUSTAINABILITY

Advocates of sustainable development recognise the social component of development as an essential part of the new paradigm. In doing so, they are validating the importance of a much older perspective of human development approach, which emphasis the issues of needs and equity. As mentioned earlier, the focus on basic needs and equity in development has been represented by the United Nations Development Program's series of Human Development Reports. In addition to calculating the Human development Index (HDI), the Human development Report focus each year on a different aspect of social and economic development such as democratic governance, gender equity and poverty. While the HDI does not explicitly include any environmental measures, many reports discussed the issue of sustainability and equity.

If the problem of environment and equity are clearly related, then the third world critics of the western development model see that the model itself is a significant cause of the problem. As we seek for models of sustainable and equitable development, the process will have to be democratised, decentralised and pluralistic. It will have to balance wealth creation with wealth distribution. And it will have to include a healthy skepticism about western models and modernizing effects of global market.

### 3.1. A SYNTHESIS OF PERSPECTIVES

In a broader perspective, the norms which must guide sustainable development policy should be the social and institutional process of setting social and environmental goals. To bring the argument down to earth and to get a sense of the principles for sustainable development, we can examine some sectorial specifics.

**3.1.1 AGRICULTURE:** The need to feed an expanding population at higher per-capita levels of consumption is straining global soil and water systems. The response to this must be twofold. On the production side, current high-input techniques which are leading to serious soil degradation and water pollution and overdraft must be replaced by organic soil rebuilding, integrated pest management, and efficient irrigation. This in turn implies much greater reliance on local knowledge and participatory input into the development of agricultural techniques. On the consumption side, both limits on population growth and greater equity and efficiency in food distribution are of central importance given probable resource limitations on production.

**3.1.2. ENERGY:** The accumulation of greenhouse gases, mean that it will be necessary to accomplish a transition away from fossil fuels well before 2050. A non-fossil energy system would be significantly more decentralized, adapted to local conditions and taking advantage of opportunities for wind, biogas, and off-grid solar power systems. This is unlikely to occur without a major mobilization of capital resources for renewable energy development in countries now rapidly expanding their energy systems.

**3.1.3. INDUSTRY:** As the scale of global industrial production increases several-fold over current levels, which themselves represent more than quadrupling over 1950 levels, it is apparent that "end-of-pipe" pollution control not be adequate. The new concept of "industrial ecology" implies the restructuring of whole industrial sectors based on a goal of reducing emissions and reusing materials at all stages of the production cycle. Corporate reform and "greening" as well as a broad cooperative effort between corporations and government will be needed to achieve goal.

**3.1.4. RENEWABLE RESOURCE SYSTEM:** World fisheries, forests and water systems are severely over-stressed. With even greater demands on all systems expected in the future, all levels of institutional management must be urgently reformed. Multilateral agreements and global funding are needed to conserve transnational resources. National resource management systems must be shifted from goals of exploitation to conservation and sustainable harvesting; and local communities must be strongly involved in resource conservation.

Each of these areas poses challenges which are social and institutional as well as economic. It is clear that the social component of sustainability is not just an idealised goal, but a necessity for achieving the economic and ecological components.

## 4.1. CONCLUSION

Development in its progression from traditional to modern mass consumption society has remained inequitable and has had growing negative environmental impact. Economic growth is clearly needed, but must be subject to global limit and should not be the prime objective for countries already at high levels of



consumption. In pursuing these modified development goals, it will be necessary to recognise the limit of the market mechanism. While market may be excellent under some conditions at achieving economic efficiency, they are often counterproductive in sustainability. Existing institutions of all kinds, including corporations, local and national government, and transnational organizations, will have to adapt to the requirements of sustainable development, if all the problems which motivated the concept of development are not to grow worse. Democratic governance, participation, and the satisfaction of basic needs are thus an essential part of a new development synthesis.

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