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# SUSTAINABLE DEVELOPMENT

## INTRODUCTION

Development experts, environmentalists and national leaders increasingly recognise that degrading the earth's resources to meet current needs is short-sighted and potentially disastrous for future generations. Future generations, not just the present generations, need those earth resources and what they will produce. Excessive cultivation, destroying forests, filling wetlands, all propelled partly by population explosion, can eventually impair the capacity of the so-called renewable resources to renew themselves. They cannot go on producing continuously. Beyond a certain level, extracting more now leaves less for the future. The fundamental questions that need to be addressed are: "Will future generations be worse off as a result of the environmental degradation that results from economic decisions made today? And will the increase in the scale of activity be sustainable in the face of increasing pressure on natural resources?"

Looking at the changes taking place around the world, it is being widely felt that the kind of world we will bequeath to our children and grandchildren may not be a better one as a result of the environmental degradation that results from political and economic decisions made today. A matter of grave concern is that those who reap the fruits of economic development today may be making future generations worse off by excessively damaging and destroying the natural resources and polluting the earth's environment.

'Sustainable development' was a major focus of the United Nations Conference on Environment and Development (UNCED) held in Brazil

in June 1992. The achievement of sustainable development globally is likely to prove one of the greatest challenges to the world community in view of the continued population growth and rising levels of consumption *per capita*. As the World Commission on Environment and Development observed, that effort to achieve sustainable development is being carried out amidst the additional pressure of such global difficulties as "climate change, ozone depletion, and species loss."[1] The continued build-up in greenhouse gases, the depletion of the ozone layer by chlorofluorocarbons (CFCs), and the continuation of species loss through habitat degradation affect developing nations no less than the Western industrialised states. The ongoing excess use of energy feeds a number of these difficulties as do burgeoning global population increases. So pressing are these problems that the term 'environmental refugee' has been coined to describe people literally deprived of a homeland because of environmental crises.[2] Some of the more pessimistic observers of the situation warn that social dislocations from environmental degradation may be one of the most alarming developments in the next century with estimates ranging above sixty million environmental refugees.

## MEANING OF SUSTAINABLE DEVELOPMENT

The legacy of the concept of Sustainable Development is attributed[3] to the Report of the World Commission on Environment and Development entitled *Our Common Future*[4] which defines it as development that "meets the needs of the present without compromising the ability of future generations to meet their own needs." Thus, it seeks to satisfy the compulsions of equity within generations of the humans and also of inter-generational equity.

'Sustainable development' is development that meets the well-being needs of present and future generations. It is concerned with evolution over a long period of time, focusing on stability issues and especially structural changes, that is, changes that result in qualitatively different characteristics of states or behaviour of the system under consideration.[5]

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1. World Commission on Environment and Development, *Our Common Future* (New York: Oxford University Press, 1987), p. 35.
2. Ibid., p. 5.
3. World Bank, *World Development Report 1992, Development and the Environment* (New York: Oxford University Press, 1992), p. 8.
4. World Commission on Environment, *Our Common Future* (Second Impression) (Oxford: Oxford University Press, 1987).
5. William J. Baumol and J. Benhabile, "Chaos: Significance, Mechanism and Economic Applications", *Journal of Economic Perspectives*, Vol. 3, 1989, pp. 77–106.

Given the global and local effects of environmental decay, it is no surprise that sustainable development has become a catchword in development planning and resource management. However, interpretation of this concept is still ambiguous. According to the Brundtland Report,[6] the idea of sustainable development reaches far beyond environmental protection, as it means a process of change in which exploitation of resources, direction of investments, orientation of technological development, and institutional changes are made consistent with future as well as present needs. It is not a fixed state of harmony but rather a balanced and adaptive process of change. Sustainability takes for granted "a balance between economic development—all quantitative and qualitative changes in the economy that offer positive contributions to welfare—and ecological sustainability—all quantitative and qualitative environmental strategies that serve to improve the quality of an ecosystem and hence also have a positive impact on welfare." Both economic and environmental systems need a certain minimum threshold value to survive.

> In essence, sustainable development is a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development, and institutional change, are all in harmony and enhance both current and future potential to meet human needs and aspirations.[7]

The Brundtland Commission's definition of the term—"meeting the needs of the present generation without compromising the needs of future generations"—is strongly endorsed by the World Development Report 1992.[8]

The concept of sustainable development rejects the traditional view that economic development is a necessity but environmental protection is a luxury. Partha Dasgupta and Karl-Goran Maler write: "Environmental resources are of minor importance to poor countries. . . . They play an insignificant role in the process of economic development. . . . Such resources are luxury goods, and they loom large in public consciousness only when incomes are high. . . . Environmental resources are only a rich country's preoccupations. . . . They are a mere diversion

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6. World Commission on Environment and Development, *Our Common Future*, (New York: Oxford University Press, 1987).
7. ibid, p. 46.
8. See World Bank, *World Development Report 1992* (New York: Oxford University Press, 1992), p. 8.

created by economists not sensitive to the true needs of the poor in poor countries. . . ."[9]

In the past decade, however, a shift has taken place from partial environmental analysis to a focus on the global effects of environmental decay—reflected among other things in alarming phenomena such as flooding, acid rain, soil erosion, desertification, destruction of the ozone layer, ocean pollution, and resource extraction. Thus resource conservation and pollution control, once thought luxuries, are now recognised as essential to protect life-supporting natural systems and to improve living standards. Leaders now increasingly recognise that socio-economic development must be sustainable—capable of meeting not only current needs but those of future generations as well.

In this context, the question is how to assess the well-being of present and future generations. What should we leave to our future generations to maximise the chances that they will be no worse off than ourselves? The issue becomes more complicated because our children do not just inherit our worn-out farmlands, eroded hillsides, polluted water and air, parched grasslands, and depleted ozone but also enjoy the fruits of our labour in the form of education, skills, and knowledge as well as physical capital. They are entitled to benefit from investments in natural resources-improvement in soil fertility and reforestation, for example.

Ashish Kothari is of the view that sustainable development as currently defined "does not adequately address the perpetuation of intra-generational inter-species inequity, and is, therefore, not acceptable from the point of view of the larger human goals of happiness, equality, justice, and peace"[10]

Thus, in considering what we leave and pass on to our children and grandchildren, we must think of the full range of physical and human capital, and natural resources that will determine their welfare and their bequests to their successors. Adopting the principle of sustainable development would necessarily require a fundamental change in thinking. The data used for decision-making must reflect the true costs of resource depletion and pollution as they affect future generations rather than just the short-term costs of profits of depleting income-producing resources.[11] The data must take account of future needs on a par with

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9. Partha Dasgupta and Karl-Goran Maler, "The Environment and Emerging Development Issues", *Proceedings of the World Bank, Annual Conference on Development Economics*, 1990 (Washington: World Bank, 1990), p. 101.
10. Ashish Kothari, "Is Sustainable Development Desirable and Possible?" *The Indian Journal of Public Administration*, Vol. XXXIX, No. 3, July–September 1993.
11. World Bank, *World Development Report 1992* (New York: Oxford University Press, 1992), pp. 34–35.

current needs, not 'discounted' in a way that carries decisions in favour of short-term effects. Sustainable development in a sense is "an alternative to the development at any cost" ethos identified with the drive to modernisation of earlier decades.

Ciriacy-Wantrup[12] emphasised the use of safe minimum standards for conservation by avoiding overexploitation of critical zones of the environment by limiting human activities that make it uneconomical to halt or reverse environment degradation. Thus the idea of sustainable development requires a careful consideration of sustainable threshold levels for both economic and environmental systems. For example, deforestation may be necessary for agriculture development in a regional economy like Brazil, but it could prove fatal and deterimental to global ecological stability. Where a country experiences rapid population growth or dramatic urbanisation, GNP increases may mask major development problems. The same difficulty arises where world demand for the raw resources from a country or a region rises to meet increasing global needs. Measures of economic growth from exports may rise but those results can hardly be called sustainable development. In sum, "until we are prepared to define sustainability in ways that take stock of both the external threat from food policies in the North and the internal threat from demographic pressure in the South, it will remain something of a chimera."[13]

Similarly, to cope with the growing problems of land pressure in India, it is necessary to (i) check and control the population growth rate, (ii) ensure balanced livestock development, and (iii) control land alienation. On the other hand, when the World Commission posits that: "Sustainable development requires that the adverse impacts on the quality of air, water, and other natural elements are minimized so as to sustain the ecosystem's overall integrity", it is no easy task to judge success.

Recognising these difficulties, the World Commission noted that measures of success in sustainable development must take account of context and of the need to meet social challenges. The sustainability aspect requires at least that environmental administrators aim:

(i) To maintain ecosystems and related ecological processes essential for the function of the biosphere;
(ii) To maintain biological diversity by ensuring the survival and promoting the conservation in their natural habitats of all species of flora and fauna;

12. S. V. Ciriacy-Wantrup, *Resource Conservation* (Berkeley: University of California Press, 1952).
13. Michael Redclift, *Sustainable Development* (London: Methuen, 1987), p. 32.

(iii) To observe the principle of optimum sustainable yield in the exploitation of living natural resources and ecosystems;
(iv) To prevent or abate significant environment pollution or harm;
(v) To establish adequate environmental protection standards;
(vi) To undertake or require prior assessments to ensure that major law policies, projects, and technologies contribute to sustainable development;
(vii) To make all relevant information public without delay in all cases of harmful or potentially harmful releases of pollutants, especially radioactive releases.[14]

It was considered at Rio that the Brundtland Report lacked a clear definition of sustainability. The World Bank's Environment Department now has formulated a new definition. It is in two parts: (i) Output guide: Waste emissions should be within the assimilative capacity of the local environment without degradation, and (ii) Input guide: Harvest rates of renewable resources should be within the natural regenerative capacity; depletion rates of non-renewable resources should be equal to the rate at which renewable substitutes are developed.

## STRATEGY FOR SUSTAINING DEVELOPMENT

The achievement of sustained development defined in terms of improving people's current needs while preserving nature's productive capacity for the future remains the greatest challenge to the world community. More than one billion people still live in acute poverty and suffer grossly inadequate access to the resources—education, health services, infrastructure, land and credit—required to give them a chance for a better life.[15] Discussions concerning developing countries are mainly centred around four issues.

### 1. Population Challenge and Strategy

Population growth increases the demand for goods and services, and if practices remain unchanged, it implies increased environmental damage. The world's population is growing at about 1.7 per cent annually—almost an addition of a hundred million a year. This rapid population growth exacerbates the mutually reinforcing effects of poverty and environmental

14. WCED Report, p. 331.
15. World Bank, *World Development Report*, op. cit. pp. 1–2.

decay. Yet environmental degradation can also increase population growth. Dasgupta is of the view that children are produced not only for earning money and food and for retirement and insurance purpose, but also to increase workforce.[16] By the middle of the 21st century, almost one-third of the world's population will live in countries with a population density of more than four hundred per square kilometres—equivalent to the density of Bangladesh, the Republic of Korea, the Netherlands or Indonesia.

Population control requires solid progress on four fronts:

(i) Access to family planning services must be increased;
(ii) Educational and employment opportunities especially for women must expand;
(iii) Incomes of poor households must rise; and
(iv) Child mortality must decline.

Choice about family planning and educational policies today will determine world population levels, and the consequent pressures on the environment, in the next century.

## 2. Water and Sanitation

The challenge for water supply and sanitation will be to meet the backlog of demand while meeting the needs of growing populations. At present one-third of the world's population has inadequate sanitation, and one billion people lack safe water. Making safe drinking water available to everyone in the next generation will require an additional service for 3.7 billion people living in urban areas and for 1.2 billion people in rural areas. For sanitation, the problem is even serious; the number of urban dwellers currently served is little more than one billion.

There is growing recognition that current approaches are not adequate to meet the needs of the coming years. Changes are needed in current policies dealing with water and sanitation.

**(i) Managing Water Resources Better:** Increase in population especially in urban areas in the next twenty years will place severe strains on surface and groundwater supplies and will call for much more efficient allocation within river basins. Since irrigation accounts for more than ninety per cent of withdrawals in low-income countries, use of irrigation water should be efficient. Similarly, urban water must also be used in an economical way. On average households in several developing countries

16. Partha Dasgupta, *An Equiry into well-being and Destitution* (Oxford: Clarendon Press, 1993).

including India pay only thirty-five per cent of the cost of supplying water. The poor still suffer the most from these policies. It is possible to raise water charges for commercial use.

**(ii) Investing in Sanitation:** In the case of sanitation, public investment is about half per cent of GDP. Much investments have been for sewage collection than on its treatment. For example, today only two to five per cent of sewage in India is treated.

**(iii) Improving Institutional Arrangement:** Evidence suggests that institutional failure is the main cause of poor performance of water and sanitation utilities. Two conditions for better performance are essential. One, utilities need to be made more autonomous and more accountable for their performance; two, they need to be placed on a sounder financial footing. The private sector may also be allowed to play its positive role. Contracting out sanitation services to the private sector by the public institutions is gaining ground in India. But privatisation is not a panacea. Community participation and other NGOs also have a significant role to play in providing water and sanitation facilities and in collecting domestic wastes.

### 3. Emissions from Industry, Transport and Energy

The challenge for energy and industry will be to meet the projected growth in demand while controlling pollution and deforestation. Unless sound policies are adopted, pollution from fossil fuel generation of electric power will rise tenfold in the next four decades, from vehicles more than five-fold, and from industrial emissions and wastes also more than five times as demand for industrial goods increases.

Pollutions from industry and transport and from domestic energy consumption impose serious costs for health and productivity. To reduce emissions, new technologies and investment in new equipments is required apart from encouraging energy conservation. Some of the solutions in tackling pollution are briefed here.

**(i) Reducing Household Energy Pollution:** Household energy use creating both indoor and outdoor air pollution should be reduced by use of biomass stoves and clean coals, and a transition to gas, electricity and solar energy.

**(ii) Reducing Pollution from Generation of Electric Power:** It is estimated that electric power generation accounts for thirty per cent of all fossil fuel consumption and fifty per cent of all coal consumption

worldwide. Shifting to natural gas and using clean coal technologies can reduce emissions of particulates and carbon monoxide by ninety-nine per cent and emissions of sulphur dioxide and nitrogen oxides by about ninety per cent. Reduction in pollution from electric power generation requires both improved management and investment in abatement technologies.

**(iii) Reducing Pollution from Transport and Industry:** Since vehicles are responsible for one-half of oil consumption and cause more than ninety per cent of lead and carbon monoxide emissions in developing countries, effective and efficient technologies are needed to be adopted to reduce lead emissions.

Similarly, industrial pollution and wastes can be attacked by use of new technologies and investment in pollution-control equipments. Incentive-based instruments must be widely used. Some countries are using performance bonds for the management of hazardous wastes. Policies designed to curb pollution directly, using economic incentives laws and regulations, are also important.

**(iv) Encouraging use of Renewable Sources:** Sustainable development emphasises use of renewable sources. Solar energy may have the best long-term prospects. Less dramatic, but more significant, progress has been made in reducing the costs of and utilising biomass and wind power technologies.

## 4. Rural Environmental Concerns

The challenges facing rural people and policy makers that need to be addressed are: (i) preventing the resource degradation that can result from rapidly growing demands for food, fuel, and fibre; and (ii) preserving valuable natural forests, wetlands, coastal areas, and grasslands for future generations.

As the world's population grows to nine millions by 2030, consumption of food will more than double in developing countries, thereby causing enormous pressure not only on agricultural land but also on stocks of water, fish and fuel. There appear to be three obstacles in the way of resource management: (i) failure to recognise the scarcity of natural resources; (ii) failure to ensure that the machinery managing natural resources is accountable; and (iii) failure to mobilise knowledge for managing environmental crises. Indeed over the past three decades increases in yields have accounted for ninety per cent of additional food production, and area expansion for only eight per cent. But

intensification and extensive exploitation can be counterproductive. Raising yields by increasing use of fertilisers, diverting more water for irrigation, and changing land use can create problems elsewhere. The excessive use of pesticides and chemicals is causing not only health problems but also declining the productivity of the soil. Addressing the environmental problems that damage the health and productivity of the largest number of people, especially the poor, will require better progress in reducing poverty and raising productivity. It is therefore imperative that the current movement of opportunity be seized to bring about "an acceleration of human and economic development that is sustained and equitable."

Natural resources will have to be managed in such a way as to ensure their future productivity. They will need protection from poor stewardship due to poverty, ignorance, corruption, and population pressure. The quality of natural resources, wetlands, coastal areas and grasslands will have to be improved from overdue and degradation.

Governments in most developing countries must devolve the responsibility for managing some resources to individuals, communities, and fiscally accountable utilities. Further, governments need to make more use of pricing to allocate resources, to protect property rights, and to support research and the dissemination of knowledge of social environmental practices.[17] Local communities must be involved in devising and implementing conservation and development projects.

## 5. International Environmental Concerns

It may be clarified that solutions to international environmental despoliation cannot come more easily than international ones for two reasons. First, no single authority can stipulate and enforce appropriate policies; and second, solutions must accommodate large variations in the balance of benefits and costs to different countries. Some poor countries have more pressing local problems and less money for solving them. To secure action, rich developed countries may need to help poor ones.

The build-up of carbon dioxide and other greenhouse gases is expected to raise average temperatures by 3° to 4° Celsius on the earth by the end of first half of the 21st century. There is even more uncertainty about the consequences than about the extent of global warming. Given the likely effects of greenhouse warming, a wise policy would include

17. World Bank, *World Development Report 1992* (New York: Oxford University Press, 1992), p. 134.

measures that both reduce emissions and improve economic performance; investments in more information to avoid the risks of costly over- or under-reaction; precautionary measures to reduce emissions now at modest costs and bring down the costs of future reductions; and financial transfers to help developing countries broaden their technological options. More strategic international action is needed to protect biological diversity. Solutions to international environment issues must be based upon common principles and rules of collaboration among independent nations, backed up by persuasion and negotiation. Due to the common international concern for biological resources, there is a strong case for more international efforts to provide funding and technological assistance to developing countries.

## STRATEGY FOR MEETING THE CHALLENGE

The challenges facing the world community are indeed formidable. Most developing countries have not yet achieved acceptable living standards for their peoples. Economic development and social change that improve human welfare are urgently needed. Protecting the environment will be an important part of improving the well-being of people today, as well as the well-being of their children and grandchildren. "Today no account of economic development would be considered complete without mention of the environmental resource base."[18]

In the future, continued economic development, better technology and improved living standards will depend on the continued productivity of the environment. Therefore, environmental quality including sound resource management, is an essential part of the development strategy. Such a co-evolutionary development, in both developed and developing countries, takes for granted that environment and development do not conflict with one another. But such a co-evolution does not exist.

## CONCLUSION

In summary, it can be said that traditional economic and industrial approaches are often incompatible with sustainable development. A basic question today, therefore, is not whether to choose between industrialisation and environment. It is now to select patterns of development

18. Karl-Goran Maler, "Environment, Poverty, and Economic Growth", in *Annual World Bank Conference on Development Economics*, 1997, p. 255.

that improve the quality of the environment. International economic cooperation is vital in this context. However, this desirable outcome will not be achieved unless nations recognise the crucial relationship between sound environmental management and international economic development. What is required is a more integrated approach towards evolving an international environmental system which responds adequately to the development needs of developing countries in the context of growing environmental despoliation.