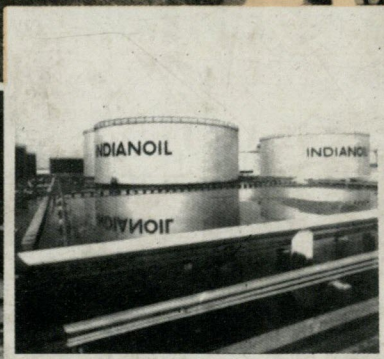
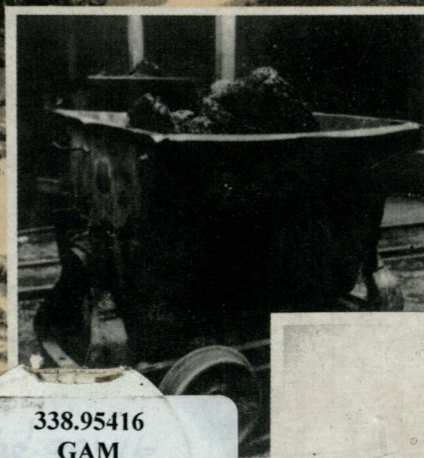


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SUSTAINABLE HUMAN DEVELOPMENT IN THE NORTH-EASTERN REGION OF INDIA

J.B. GANGULY



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Considerable progress in the spread of literacy and education, expansion of medical and health care services, construction of new roads and railway lines, generation of power, extension of transport and communication facilities, etc. has been achieved under the plans in the North-Eastern Region. Yet, according to Professor Ganguly, the on-going paradigm of development based on centralization of decision-making process has severely eroded the role of the community and the egalitarian ethos of ensuring equitable access of every household to productive resources like land, forests, water, etc. The region's natural resources are being depleted at a fast rate, biodiversity is being lost and the dependence of the rural and tribal masses on the biomass in their neighbourhood to meet many of their daily needs is in jeopardy.

Professor Ganguly has finally formulated an alternative model of sustainable and people-centred development through the empowerment of the community and provision of opportunities for larger participation of women in the society's decision-making process. The existing bias for bigness of projects and schemes and external impulses and inducements for change should give way to smallness of projects to be identified and managed as far as practicable by local communities. The technology to be used should mainly be local manpower and other resources. Such restructuring of the planning process will not, of course, do away with the need for the state interventions in providing for the social safety net for the poor and the needy and for the basic infrastructure having inter-state dimensions.

Professor J.B. Ganguly, first Vice-Chancellor of Tripura University, has been engaged in research work in the fields of his specialization even after retiring from active university service in 1993. He has a long experience of conducting field work in different states of the North-Eastern Region which has enabled him to acquire an intimate knowledge of the developments taking place in the different spheres in the region.

He has published a number of research papers in journals and anthologies and has authored three books and edited two collections of papers—all on the NER. Besides, he has presented papers in a number of regional, national and international seminars and symposia.

**Sustainable Human Development
in the
North-Eastern Region
of India**

By
J.B. Ganguly



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**North-East
Gender and Minorities Cell**

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Chapter 1

The Concept of Sustainable Human Development

The Genesis of the Concept

Spectacular development in the field of science and technology has given humankind tremendous power of harnessing natural resources, particularly the 'free energy locked in fossil fuels' for increasing production of material goods and services. This power is not evenly distributed between countries. Those countries which acquired mastery over this power became the industrialized and rich countries of the north. They represent only 20 per cent of the world's total population. Motivated by the belief that resources did not place any limit on the capacity to produce more goods and guided by the ideology of 'more is better' these countries have been producing and consuming more and more by using up fossil fuels at a very fast rate 'leading to global pollution, climate and sea-level change.'

This process has been encouraged by the Neoclassical economic growth model propounding the possibility of achieving steady-state economic growth on a sustained basis. Very briefly this theoretical construction may be stated as follows:

In the production of goods and services the various factors of production are used. For simplification of

analysis let the number of factors or inputs be taken as two, namely, capital and labour. It is presumed that the factors of production are substitutable for one another without any limit. And the scarce resource is substituted by the abundant one depending on their relative prices. As a resource becomes relatively scarce its relative price rises. Therefore the tendency will be to employ more of the abundant resource price of which is lower. This will lead to a change in the capital-labour ratio in production which will entail a change in the technology of production. Growth of labour supply depends on the growth of population and productivity of labour depends on technical progress. It has, therefore, been explained that the rates of growth of population and technical progress ultimately determine the longrun rate of economic growth.

Based on such premises the economists have worked out several versions of 'golden age' of growth by which is meant a state of dynamic equilibrium which can be continuously maintained by achieving the desired rate of accumulation of capital given the rates of growth of population and output per labour which depends on the rate of technical progress. This ushers in the so-called 'golden age' because starting from a state of full employment or near full employment 'and a composition of the stock of capital appropriate to the desired rate of accumulation,' as explained by Joan Robinson, output and income go on growing continuously while maintaining the state of full or near full employment in the country. This implies that, there are no ups and downs in economic activities and no cyclical unemployment and misery. Also, in such a state of steady state growth per capita consumption grows at the maximum rate which is the equilibrium rate. This situation has been equated with maximum social welfare which the people enjoy ever after.

The basic premise of such constructions of static and dynamic equilibria is that human welfare depends on material wealth and that welfare grows as the acquisition of

material wealth grows. And there is no limit to growth of production of goods and services as there is no absolute scarcity of resources required for production though there may be relative scarcity. But a relatively scarce resource can always be substituted by a relatively abundant one. The competitive market mechanism brings about the optimum allocation of resources for production of goods and services and also the distribution of output or income among the different factors of production according to their respective contributions to the total output.

The utopian concept of the possibility of enjoying increasing level of consumption without any limit is a physical impossibility. According to the First Law of Thermodynamics total quantum of matter and energy is fixed. Production of goods and services means transformation of matter and energy from one form to the other. The Second Law of Thermodynamics (increasing entropy) implies that such transformation leads to disorganization and dissipation of energy causing the total amount of usable energy to fall although the total amount of energy as such remains unchanged. Energy once used up cannot be recycled. Such a limitation ultimately also applies to materials which can be recycled, it is true, but never to the extent of cent per cent; a part of the materials is irrevocably lost in each stage of use.

The dangers of depletion of natural resources and abuses of the environment on account of growing 'industrialism and population' is ultimately explainable in terms of the entropy law. Leaving aside the concern about the ultimate heat death of the universe (when the quantum of usable energy will be nil as the total quantity of energy falls below the usable level as a result of disorganization and so becomes useless) we are to take note of the entropy law for our immediate guidance to action. Herman E. Daly brings out the fact most effectively in the following words (1977 : 110) :

"The effect of the entropy law is as immediate and concrete as the facts that you can't burn the same tank of gasoline twice, that organisms cannot live in a medium of their own waste products, and that efficiencies cannot reach, much less exceed, 100 per cent. The low entropy of highly organized stocks of wealth and human bodies must be maintained by the continual importation of low-entropy inputs from the environment and the continual exportation of high-entropy outputs back to the environment, where through the agency of solar-powered biogeochemical cycles they are transformed into low-entropy forms on varying time scales. The entropic flow, beginning with depletion and ending with pollution (the throughput), is the necessary cost of maintaining the stocks of commodities and people. Too large a throughput can disrupt the biosphere and impair its capacity to assimilate wastes. . . . this entropic degradation is a cost and must be reckoned as a cost and minimized for any chosen level of population and per capita wealth."

Even without going into such fundamentals, a number of scholars and authorities in the sixties and seventies voiced their concerns about the conflict between 'the finite environment and an ever-increasing demand on that by growing industrialism and population.' In the U.S.A. Rachel Carson published her book, "Silent Spring" in 1962 which set a large number of Americans expressing their words of caution against the process of environmental degradation, exhaustion of natural resources at a fast rate and the fall in the carrying capacity of earth on account of high rates of growth of population in the developing countries. The 'Club of Rome' organized by the Italian economist and businessman A. Peccei brought out publications like "The Predicament of Mankind", "Where Are We Going?", etc. One of the most referred to works is "The Limits to Growth" sponsored by the Club of Rome and written by noted scholars

led by D.H. Meadows. The American biologist B. Commons wrote "The Closing Circle" to bring out the threat of ecological disasters of the on-going development process. These works represent expressions of concern about the bleak prospects of human survival in the long run unless appropriate measures are taken to avoid overtaxing of the environment upon which the human life and society depend.

Daly has even propounded an impossibility theorem to explain that there is a limit on the number of 'person-years' of high consumption of industrial life-style as in the U.S.A. (1979 : 38). Contesting the contention of many growth economists that this difficulty could be overcome by technological improvements he points out that many of the so-called technological triumphs fail the first test of not 'increasing costs of other users either now or in the future'. Quoting Aldo Leopold, Daly points out that the technical improvements of the recent past represent "improvements in the pump, rather than the well" (*op cit.* : 45).

The emphasis laid on achieving growth even in rich countries is an attempt at evading the compulsion of reducing inequality in the distribution of income and wealth for avoiding social conflict. But with the passing of time the prognostications made by the physical and social scientists about the dangers of the on-going pattern of resource use particularly in the industrialized west have been convincing more and more people that technology cannot resolve the problem of finiteness of the environment and that humankind's future is vitally linked up with the achievement of conservation of natural resources and protecting the environment from pollution which has been threatening the very life-support system of the space ship earth.

International Awareness and Actions

Adverse consequences of environmental degradation like global warming, ozone depletion, water pollution, destruction of bio-diversity, etc. do not remain confined to any

particular country or group of countries. These problems have global dimensions and conservation of the global commons implies international understanding and cooperation. Therefore, the UNO became involved in mobilizing world opinion in favour of conservation of resources and protection of the environment through actions both at the national and international levels. With this end in view the United Nations Conference on the Human Environment was organized in 1972 at Stockholm, Sweden. Both the developed and developing nations participated in the conference and highlighted the problems faced by them respectively and agreed that international cooperation was needed to address the problem. From this conference emerged the concept of "eco-development" which 'focused on the satisfaction of basic needs in an environmentally sound production system. The achievement of self-reliance needed for such a production system was the basis of eco-development approach' (Nayar 1994, p. 1327).

In the later half of the eighties a definite shift in the approach of developed countries to address the environmental issues took place. They were not interested in promoting self-reliant growth in the developing countries in order to ensure protection of the environment. It was asserted that the high rate of growth of population in the third world countries was the root cause of persistent mass poverty and the consequent environmental degradation. These factors combine to make the process of development unsustainable in these countries. Achievement of sustainable development by checking the growth of population and restricting the use of natural resources within the permissible limit set by the carrying capacity of a given territory should, therefore, be the main agenda of action for environment management. The International Union for the Conservation of Nature formulated the World Conservation Strategy in 1980 in which the concept of sustainable development was first spelled out (Nayar, *ibid*, p. 1329). The World Commission of Environment and Development set up by

the UN General Assembly submitted its report entitled "Our Common Future" which was adopted by the General Assembly in 1987. This report highlighted the idea of sustainable development as an approach to environment management. Sustainable development implies "meeting the needs of the present without compromising the ability of future generations to meet their own needs."

The north-south dialogues on measures for conserving and enhancing the earth's resources, that is, achieving sustainable development through mutual cooperation have taken place in several international conferences and on world fora. But a commonly agreed agenda of effective actions are yet to evolve. The paradigm of sustainable development needs to be interpreted in more meaningful terms. The deliberations held in the Earth Summit held in Rio de Janeiro emphasized the fact that the process of development to be sustainable should be socially equitable, ecologically viable and, of course, economically efficient (Gowarikar and Sachs 1994, p. 1383). The concept of sustainable development should also subsume the concept of sustainable consumption. The United Nations Environment Programme has drawn attention to the fact that "current consumption pattern in developed countries are not sustainable, because their global duplication would cause intolerable impacts on natural resources, public health and our sustaining ecosystem". Principle 8 of the 1992 Rio Declaration on Environment and Development also states:

✓ "To achieve sustainable development and a higher quality of life for all people, states should reduce and eliminate unsustainable patterns of production and consumption, and promote appropriate demographic policies".

According to the UNEP, "a possible working definition for sustainable consumption means the provision of services, and related products, which respond to basic needs and bring a better quality of life, while minimizing the use of natural resources and toxic materials as well as the emissions of waste and pollutants over the life cycle of the

service or product with a view not to jeopardize the needs of future generations." (UNEP, Elements For Policies For sustainable Consumption as quoted in the Report on the Symposium on Sustainable Consumption held at Oslo, Norway, 19-20 January 1994).

The perception of development has changed in the recent years. Earlier the emphasis was on 'economic' development, now it is on 'human' development. The United Nations Development Programme has been publishing annually since 1990 reports on human development in all the countries of the world. The concept of human development emphasizes the fact that people must be at the centre of all development. In its HDR for 1992 the UNDP enlarged the concept of human development as 'sustainable human development' to highlight the need for having the process of development that is economically, socially and ecologically sustainable. "That is, current consumption cannot be financed by incurring debts that others must repay in the future. Investment must be made in the health and education of today's population so as not to create a social debt for future generations. And natural resources must be used in ways that do not create ecological debts by over-exploiting the carrying and productive capacity of the earth": (p. 17). The concept has been further elaborated in the 1994 HDR 9 p. 4): "In the final analysis, sustainable human development is pro-people, pro-jobs and pro-nature. It gives the highest priority to poverty reduction, productive employment and environmental regeneration."

The principle of sustainability is vitally linked with the principle of equity both at the national and international levels. The poor sections of the society are constrained to overuse their environment for eking out an existence. For them the problems of global warming or depletion of the ozone layer have little meaning. They are vitally affected by, what the UNDP has termed, 'silent emergencies', namely, polluted water, degraded forests and land and environmental diseases, etc. For them 'what is at risk is not the quality

of life but life itself'. And if poverty cannot be removed, environmental sustainability cannot be achieved.

The strategies for achieving sustainable human development at the national level must be so formulated as to reduce poverty, create employment opportunities and strengthen social integration. For alleviating poverty the state must provide (i) basic social services like basic education and primary health care for the poor, (ii) carry out land reform measures for ensuring equitable distribution of land and agricultural resources, (iii) extend credit supply facilities to all those who need this important input for production, (iv) expand employment opportunities so that everyone can have sustainable livelihood and (v) build up a social safety net 'to catch those whom markets exclude' (*ibid*, p. 20). The basic requirement for the success of anti-poverty strategy is that it must be decentralized and participatory. "The poor cannot benefit from economic development if they do not even participate in its design" (*ibid*). For creation of employment opportunities for all adequate investment should be made in education and skill formation of the people, necessary physical infrastructure built up, stable macro-economic policies followed to maintain a favourable climate for investment, labour-intensive technologies followed in developing countries having comparative supply of abundant labour, creation of employment possibilities by organizing public works programme and special measures taken by the government for the benefit of the disadvantaged groups, such as women and weaker sections of the society.

To realize the goal of enabling all ethnic groups to actively and effectively participate in productive activities for achieving sustainable livelihood for all an important policy strategy must be to promote the process of social integration. For this purpose besides ensuring equality before law for all, protecting minority rights and culture, eradicating all kinds of discrimination against any group, special measures should be taken to expand educational facilities and

employment opportunities particularly for the most disadvantaged and marginalized groups including women. Ultimately, of course, the sure way of enhancing social integration is to decentralize administrative functions and to enable the people to directly participate in running grass-roots organizations.

The new paradigm of development formulated by the UNDP "also recognizes that not much can be achieved without a dramatic improvement in the status of women and the opening of all opportunities to women" (*ibid* : 4).

The concept of sustainable human development has a global dimension. A new global ethic should inform the building up of an equitable world order. The world is sharply divided into rich nations having one-fourth of the world population and the poor nations accounting for the remaining three-fourths. One-fourth of the world population is even deprived of the basic human needs while the rich nations consume four-fifths of humanity's natural capital without paying for it. Environmental sustainability implies maintaining the health of the global commons. All nations must take concerted actions for preserving the global commons. The present pattern of sharing the environment as a cost-free resource has enabled the rich nations not to bother about conserving the environment. These nations have been mostly responsible for polluting the environment. The UNDP has estimated that if "the environment were correctly priced and tradable permits were issued to all nations (50% on the basis of GDP and 50% on the basis of population), the rich nations might have to transfer as much as 5% of their combined GDP to the poor nations" (*ibid* p. 19). Through such transfer of consumption abilities from the rich to the poor nations a move towards achieving some global balance in the use of environmental resource may be made. In the ultimate analysis, the ideology of shared responsibility for global sustainability cannot be isolated from the ideology of shared global prosperity.

India's Approach to Sustainable Development and Achievement: An Appraisal

The Government of India had adopted the policy of conservation of resources and protection of the environment in the early seventies. At the Stockholm Conference in 1972, Mrs. Gandhi, the then Prime Minister, emphatically pointed out that 'poverty was the greatest pollutant' and that for removal of poverty a 'non-exploitative strategy of development' should be pursued. She further asserted that the objective of achieving development and that of protecting the environment were not contradictory but complementary. Later she formulated the government's policy of achieving 'rapid economic development without ecological damage'. In keeping with this goal, the National Committee of Environment Planning and Coordination was constituted in 1972. "In 1980 an expert committee headed by Narayan Dutt Tiwari, the then Union Minister of Planning, recommended that a department of environment be created at the centre; environment advisers be appointed in the different ministries, who would assess and monitor the ecological consequences of development policies and projects; and that a national committee on environment planning be set up to serve as a 'think-tank' to go into the problems of conservation and to suggest remedial measures, etc."

The National Committee on Environment Planning and Coordination brought out the alarming proportions of environmental degradation and destruction of land and water resources in its draft report published in 1981. It revealed that "of the total land area of 304 million hectares, over 175 million hectares were environmentally endangered, due to deforestation, erosion and water-logging. The area affected by floods had doubled from 20 million hectares in 1971 to 40 million hectares entailing an average loss of Rs. 700 crores. Only 12 per cent of the land surface was under adequate forest cover as against the target of 33 per cent by the 1952 national forest policy" (Suraiya, 1984).

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This report alerted the Government for taking steps against environmental degradation in the country and the Department of Environment was established in 1981 for dealing with the environmental issues. The creation of this department made it possible for the Government to undertake several measures and projects for addressing the problems of environmental degradation in acceptance of the concept of eco-development as formulated and recommended for adoption by all member countries in the 1972 Stockholm Conference on Environment and Development. This concept "focused on the satisfaction of basic needs in an environmentally sound production system. The achievement of self-reliance needed for such a production system was the basis of eco-development approach" (Nayar, 1994, p. 1327).

The concern for environmental conservation even as the process of social and economic growth and development should be maintained was reflected in the Sixth Five Year Plan (1980-85) document. It was stated therein that in preparing plans and programmes a crucial guiding dimension must be an assessment of their impacts on the environment. The two kinds of environmental problems faced by India, according to the Planning Commission, were people's poverty and underdevelopment on the one hand and the negative effects of the very process of development on the other. In its words: "The first category has to do with the impact on the health and integrity of our natural resources (land, soil, water, forests, wildlife, etc.) as a result of poverty and the inadequate availability, for a large section of our population, of the means to fulfil basic human needs (food, fuel, shelter, employment, etc.). The second category has to do with the unintended side effects to achieve rapid economic growth and development" (The Sixth Five Year Plan (1980-85), p. 343).

Categorizing the specific areas of environmental and eco-development problems in the country the Planning Commission highlighted the "colossal damage done by the

denudation of the Himalayas and other watersheds to our water resources," the rate of deforestation, extinction of some species of ecosystems, increasing rate of pollution of environment, etc. To check the process of such ecological deterioration and to conserve effectively the country's rich biodiversity the Planning Commission formulated the programmes of eco-development. In doing so it presumed that without checking the rate of growth of population and enabling the people to meet their basic needs and improving the quality of their life, the environmental health of the country cannot be truly protected. Even as in this sense the very planning of national development promotes the cause of environmental conservation, specific programmes are required to be undertaken for correcting numerous local and regional stresses on environmental resources which result from the prevailing conditions of poverty and underdevelopment and from 'the unintended side-effects of programmes for national development.'

The policy of conservation of land, water, forests, biodiversity and checking of environmental pollution, etc. for eco-development ultimately aims at ensuring sustainable use of resources. And the Government of India's approach to sustainable development emphasizes the alleviation of poverty of the masses as the best guarantee for protection of environment. At the same time the necessity for adoption of specific programmes of action and legislative measures for protection of environment was also underlined.

In accordance with this policy the Department of Environment was entrusted with the work of undertaking environmental appraisal of different development projects proposed for inclusion in the plan. The department also monitored the level of environmental pollution and working of regulatory measures for pollution control, conservation of diverse bio-resources, marine eco-system, etc.

The work of this department expanded over the years. Therefore it was upgraded into a ministry in the

Government of India under the name of Ministry of Environment, Forest and Wildlife in 1985. In the following year the Environment Protection Act was passed to empower the Government to coordinate the functions of the statutory and other agencies involved in environmental protection at the central and state levels. The setting up of the National Wasteland Development Board in 1985 was another step in coordinating and monitoring schemes of waste land development and robust afforestation programmes in the country. Similarly the Ganga Action Plan was initiated in 27 cities to make this great river system free from pollution. In India's planning system it is now a compulsory requirement that environmental impact assessment studies are made in respect of all projects which are required to be cleared by the Government/Planning Commission. Sanctions of projects, be it river valley development, power generation—hydel, thermal or atomic—setting up of mining or industrial units or development of ports and harbours or even urban land-use, etc. are given only after a project is cleared after making such studies.

The integration of the concept of eco-development in the formulation and implementation of the Five Year Plans of the country reflected, by implication, the Government's upholding the concept of sustainable human development. Much before the United Nations Development Programme propagated the concept of human development in 1990, that is, when the First Five Year Plan of India was prepared in 1951 by the Planning Commission, it was stated that the objective of planned development would be "to open to all people opportunities for a richer and more varied life." This is indeed the essence of the idea of human development as defined by the UNDP. According to this definition the objective of development should be to expand human capabilities and enlarge the range of people's choices.

The concept of sustainable development, in the sense that harmonious interdependent relations between man and nature should be maintained while the growth of national

output is achieved, was enshrined in India's planning process at the time of preparing the Fourth Plan (1969–74). In the Fourth Five Year Plan it was stated:

“The physical environment is a dynamic, complex and inter-connected system in which any action in one part affects others. There is also the interdependence of living things and their relationships with land, air and water. Planning for harmonious development recognizes this unity of nature and man. Such planning is possible only on the basis of a comprehensive appraisal of issues—particularly economic and ecological It is necessary, therefore, to introduce the environmental aspects into our planning and development. Along with effective conservation and rational use of natural resources, protection and improvement of human environment is vital for national well-being. It is particularly important that long-term basic considerations, the social costs and benefits be used as the yardstick rather than private gains and losses” (Quoted in Raza, 1990, p. 27).

Of course, the goal of sustainable development as such was formally adopted as the development policy of the country in 1992. In that year the Ministry of Environment and Forests, Government of India submitted to Parliament the National Conservation Strategy and Policy Statement on Environment and Development. The concept of sustainable development was the cornerstone of that policy statement. It explained that there was no real conflict between the goals of development and that of conservation of resources. It also laid stress on the removal of poverty through development, controlling the rate of growth of population and appropriate management of resource use or what may be termed as ‘resourceful use of renewable resources’ for realizing the goal of sustainable development.

The Approach to the Eighth Plan (1990–95) document succinctly explained the objective of sustainable development as follows:

“...Improvements in the standards and quality of life of the people have to be based on sustenance of life support systems through conservation and regeneration of the natural resource base. The present generation owes this not only to itself but also to future generations and to myriad other species with which its survival is organically and irrevocably linked. What is needed is an ecological imagination that informs development thinking.

“... There should be more rigorous scrutiny of the environmental impact of every development scheme, and ecologically sustainable development accepted as an end in itself” (p. 44).

Even as the Planning Commission and the Government have been aware of the need for conservation of resources, actual performance has been far from satisfactory. As the Approach to the Eighth Plan admits:

“Deforestation, desertification, pollution of the atmosphere and of the rivers; fast depletion of water tables, and destruction of top soil have all affected the very survival of our people” (p. 43).

Clearly, faulty planning and management of resources and application of inappropriate technology and persistent poverty of the people have contributed to such environmental degradations and erosion of natural resource base.

We may have an idea of the status of India's natural resources balance sheet as culled from Human Development Report 1995 (p. 189) and given in Table 1.

The proportion of arable land to total land area is quite high in India, namely, 57%. Of course the whole of the arable land area is not actually under cultivation. The Agricultural Census of 1970-71 showed that 49.4 % of the total land area of the country was under agricultural operations.

Table 1 : India's Natural Resources Balance Sheet

1. Land area (1000 sq km), 1992	2973
2. Arable land (as % of land area), 1992	57.1
3. Irrigated land (as % of arable land area), 1992	27.0
4. Forest and woodland (as % of land area), 1992	23.0
5. Annual rate of deforestation : 1980-89(%)	2.3
6. Reforestation (1,000 ha per year): 1980-89	138
7. Internal renewable water resources per capita (1,000 cu m per year), 1992	3.1
8. Annual fresh water withdrawals (% of water resources): 1980-89	41

As the National Committee of Environment Planning and Coordination has pointed out (see p. 11 above), 175 million hectares or about 53% of the land area is environmentally endangered. This is really an alarming problem facing the country having a high rate of growth of population.

India's achievement in bringing arable land under irrigation is comparatively low. South Korea (64%), North Korea (72.3%), China (50.9%) and even Indonesia (36.7%) have higher proportions of arable land under irrigation than that of India which is only 27%. Annual fresh water withdrawals being 41% of total water resources, the potential of expanding the area under irrigation still remains to be fully realized.

Keeping of land under forest cover is an important means of conserving the land resource and protecting land from soil erosion. According to the National Forest Policy of 1988 a minimum of one-third (i.e., 33.33%) of the total land area of the country should be under forest or tree cover. "In the hills and mountainous regions," it says, "the aim should be to maintain two-third of the area under such cover in order to prevent erosion and land degradation and to ensure the stability of the fragile eco-system". The present position is quite disappointing since only 23% of the country's land area is under forest and woodland. What is of greater concern is that the annual rate of deforestation is 2.3%. As against that with the annual rate of

reforestation of 138,000 hectares it will take quite a long time to reach the goal of bringing one-third of the land area under forest, if at all it is achieved.

The above facts clearly indicate that India has not been able to maintain, and far less to enhance, the stock of her basic natural resources like land, water and forest. But these resources need to be conserved with utmost efforts as the pressure on them has been increasing rapidly with the rise in population at a high rate. Though the rate of growth of population marginally declined from 2.22% during the 1971–81 decade to 2.14 % in the 1981–91 decade, it is still quite high. The UNDP has estimated that at the current growth rate (1992), India's population will be double by 2028 A.D. (Human Development Report, 1995, p. 187). According to the World Bank's Development Report, 1993, India's population is likely to rise from 866 million in 1991 to 1365 million by 2025. Even if we agree with this projection, it will mean that the pressure on land and other natural resources of the growing population will be extremely difficult to sustain unless an appropriate strategy is adopted for preserving and enhancing these resources and using them efficiently for productive purpose on a sustainable basis as also for substantially bringing down the rate of growth of population.

There have been various estimates of India's food needs for the future based on alternative projections of population growth and distribution of income and income-elasticity of demand for food. Food demands projected by Radhakrishna and Ravi for the years 2000 and 2010 amount to 205.26 and 250.21 million tonnes respectively as against that of 183.71 million tonnes in 1995 (Bhalla 1994: 5). Such tremendously increased needs for food will have to be met by our agriculture sector without jeopardizing the sustainability of the land and related resources.

Since the mid-1960's India has been depending on the so-called green revolution technology in achieving spectacular increases in food production in the country and thereby

strengthening the food security system. Uses of high-yielding varieties of seeds, irrigation water, chemical fertilizers and pesticides have been the core input package of the new technology. But the application of heavy doses of chemical fertilizers and pesticides as pest control measures have been causing environmental pollution and over-exploitation of underground water resource has been leading to rapid exhaustion of this valuable asset. The on-going green revolution technology has been damaging the soil structure quality and thereby seriously affecting the sustainability of the agricultural system.

Vandana Shiva (1993: 238) has accused that green revolution in agriculture "was primarily a recipe for introduction of monocultures and destruction of diversity. This was also linked to introduction of centralised control of agriculture and erosion of decentralised decision-making about agriculture and cropping patterns. Uniformity and centralisation made for social and ecological vulnerability and breakdown . . ."

M.S. Swaminathan has, however, joined issue with the critics of the green revolution claiming that by raising per hectare productivity of foodgrains, the green revolution has saved much of our forests from being converted into farm lands in order to meet the additional demand for food. He cautions that slowing down of the process of agricultural intensification and diversification in our country will be socially disastrous. For, seventy per cent of our population is dependent on agriculture and allied activities including agro-industries. New opportunities for providing livelihood for additional eleven million persons will have to be created every year in India. And much of this burden will have to be borne by the agrarian sector. "Importing food and other agricultural commodities will hence have the same impact as importing unemployment. Thus what we need now is an environmentally sustainable and socially equitable green revolution—what may be termed an ever-green revolution" (The Hindu Magazine, Sunday, 21 May 1995).

Intensive cultivation of land without conservation of soil fertility and soil structure has been termed exploitative farming by Swaminathan. This will lead to desertification while irrigating farmlands without building proper drainage system will turn soil alkaline and saline. Indiscriminate use of pesticides, fungicides and herbicides will disturb biological balance and cause increasing incidences of cancer and other diseases. Over-tapping of underground water without appropriate provision for recharging the source will soon exhaust the reserve. He has also cautioned that the growing tendency of replacing "the numerous locally adapted varieties with one or two high-yielding strains in large contiguous areas would result in the spread of serious diseases capable of wiping out entire crops" (*ibid*). The existing trend of exploitative agriculture has been termed by Swaminathan as "Greed Revolution". He wants to get it replaced by 'sustainable green revolution' (or ever-green revolution) through the widespread adoption of what he calls ecotechnologies. "Ecotechnology involves", according to him, "the blending of the ecological prudence and technologies of the past, with the best in frontier technologies, particularly biotechnology, information technology, space technology, renewable energy technology and management technology. Without ecotechnological empowerment, farmers and -women will not be able to produce more food and other agricultural commodities on an environmentally sustainable basis from less land, water and energy resources." (*ibid*).

Adoption of such technology will need 'appropriate packages of services and public policies.' Swaminathan even suggests the enactment of a National Food Security Act making it obligatory for the producers to adopt measures for conservation of land, water, forests, biodiversity and the protection of the atmosphere. Maintenance of adequate food security reserves must be also legally binding. The other aspects of the legal measure should be elimination of endemic hunger, adoption of better post-harvest

technology, empowerment of the households to be entitled to equitable access to productive assets, employment, income, etc.

The objective of achieving sustainable development is based on the premise that it is quite possible for achieving growth of the Gross Domestic Product on a sustained basis while maintaining and enhancing the stock of 'natural capital'. But this would be possible if the model of development is socially equitable ecologically viable and economically efficient. And India's, unsatisfactory record in ensuring sustainable use of resources is partly attributable to the fact that the Government has been following a development model which is basically inequitable in respect of the distribution of the increased output of goods and services among different sections of the society. The ongoing process of structural reforms and the globalization of the economy is likely to further enhance the process of growing inequality in the society. It must be, however, noted that the Government has been carrying out certain programmes directly aimed at helping the poor and unemployed. The Minimum Needs Programme, Integrated Rural Development Programme, Jawahar Rojgar Yojana, employment programmes for the urban unemployed, special women's assistance and old age pension scheme, etc. represent the Government's intervention for helping the poor. There are also several other schemes for helping the poor and the under-privileged like the landless labourers, small and marginal farmers, artisans and weaker sections of the society, such as, the scheduled castes and scheduled tribes and members belonging to the other backward classes. Even then ineffective implementation of measures like land reforms and imposition of ceiling on land holdings, distribution of surplus land to the landless, allotment of house sites to the homeless has failed to make any substantial dent in the inequality in the distribution of wealth. No wonder, the percentages of population lying below the poverty line both in the rural and urban areas are still quite considerable. In 1987-88 these ratios were

39.06 and 40.12 respectively as estimated by the official experts' group headed by D.T. Lakdawala.

The concept of human development according to the UNDP entails development of the people, for the people and by the people. "Development of the people means investing in human capabilities, whether in education or health or skills, so that they can work productively and creatively. Development for the people means ensuring that the economic growth they generate is distributed widely and fairly." Development by the people would mean 'giving everyone a chance to participate.' "The most efficient form of participation through the market," says the UNDP, "is access to productive and remunerative employment." So it continues to assert that "the main objective of human development strategies must be to generate productive employment." This is particularly important because contrary to the assumption that economic growth through increasing output would necessarily increase employment, over the past three decades, "the growth rate for employment in developing countries has been about half that for output" (Human Development Report, 1993, p. 3).

In India the same trend is reflected in the fact that the unemployment rate is still very high. In 1990-91 total labour force in the country was 314.9 millions and the worker participation rate just 37.6% only. Labour force participation based on usual principal status as given in NSS estimates indicate that it was 54.9% for rural male, 24.3 % for rural female, 53.2% for urban male and 13% for urban female populations (Economic & Political Weekly Research Foundation, 1994, p. 1232).

The development process in India has also been ecologically unviable in some vital sectors. The growth of output is heavily dependent on the intensive and extensive extraction of natural resources. The poor people are largely dependent on the sustainable use of resources around their habitats for their survival. But as a consequence of the ongoing development process they are being increasingly deprived of their

access to such resources whose stock has been depleting steadily. For allocation of resources for production of goods and services the country is relying more and more on the market mechanism. But here the markets for both inputs and outputs are so segmented and amenable to manipulation by the powerful sections of society that the market mechanism leads to growing inequality and existence of idle resources including the human resource.

The technology used in some sectors of the economy is energy-intensive and labour-displacing. Chemical fertilizers, pesticides, insecticides, herbicides, etc. are being over-used resulting in pollution of water courses and contamination of agricultural, horticultural and dairy products and many other consumption goods. The industries are heavily depending on hydrocarbon or fossil fuels as the main source of energy and thereby causing fast depletion of these non-renewable resources and also pollution of the atmosphere. Only recently the Government has undertaken the programme of development of the non-conventional sources of energy seriously. India should undertake the programme of "resourceful use of renewable resources" more vigorously. Gowariker and Sachs have aptly claimed: "A bioma-ssbased modern civilization is not only possible but necessary and, in this respect, tropical countries have a comparative advantage" (1994, p. 1383).

Regarding the fuller use of India's vast potential of biomass resources the Approach to the Eighth Plan document outlined the plan of actions as follows:

"To sustain social and economic development, especially in rural areas, steps are necessary to protect the remaining forests and to enhance the biomass resources, especially through development of wastelands. Realisation of the full potential of forests and wastelands in a sustainable manner which has substancial employment potential would be a key element to the revitalisation of the rural economy. Sustainable management of forests

would require an institutional framework which would facilitate people's active involvement. . . . Every effort needs to be made to promote grassroot level participation in the task as part of a larger approach to the local area planning and development" (*op cit.* p. 44-45).

The National Forest Policy of 1988 also mentions that the main "aim of Forest Policy must be to ensure environmental stability and maintenance of ecological balance including atmospheric equilibrium which are vital for sustenance of all life forms, human, animal and plant. . . . "This policy declaration was followed by joint forest management policy resolutions by the Centre and States. West Bengal and fifteen other State Governments have taken up the programme of implementing the system of joint forest management. But the proposed new Forest Bill has been adversely commented upon by the environmentalists on the ground that it will concentrate more power in the Central Government in the matter of forest management and thereby the powers and privileges of the local people, particularly the tribal communities, in having access to the forest will be curtailed. But it is they who are directly concerned with the conservation of forests as they survive on that. Centralization in forest management may lead to more commercialization of forests and ultimately denudation of forests to the detriment of the local people's interests and ecological damages.

To stop the process of degradation of natural resources, empowering of people at the grassroot level for formulation and execution of local level plans of development is called for. The enactment of the 73rd (Constitution) Amendment Act, 1992 has made it obligatory for the State Governments to constitute panchayats at the village, intermediate and districts levels. Thus the panchayats will be able to function as the third stratum of government in our federal structure. Their powers include preparation and implementation of plans of development in respect of the following subjects:

agriculture, land improvement, implementation of land reforms, land consolidation and soil conservation, minor irrigation, water management and watershed development, animal husbandry, fisheries, social forestry and farm forestry, small scale industries, rural housing, drinking water, fuel and fodder, rural infrastructure, etc.

The tribal areas have been kept outside the jurisdiction of this Amendment Act. In the North Eastern States, where the Autonomous District Councils are in existence, they may constitute village councils in their respective areas. In fact some of them have constituted such village bodies. But the extension of the 73rd Amendment Act or a similar one to the tribal areas will give more powers and resources to such bodies. Therefore it is urgent that some legislative action is taken in this respect in consultation with the local people concerned.

An important feature of the Amendment Act is that at least one-third of the seats in the panchayats are reserved for women. Besides empowering women and improving their status in the society this measure will also promote the cause of environment conservation programmes. Being more directly concerned with the collection of fuel-wood and other minor forest produce and fetching water for meeting the family's needs they will be more deeply involved in the programmes of conservation of forest and water resources. [The author's earlier thoughts on India's approach to sustainable development are indicated in his paper on *A Strategy for Sustainable Development of India* (1996, pp. 182-192)].

India has miles to go in terms of women's development. The UNDP in its Human Development Report for 1995 has worked out a new Gender-related Development Index (GDI). Besides measuring achievements in life expectancy, educational attainment and purchasing-power adjusted per capita real income this index also includes the measurement of inequality of achievement between men and women. The greater the gender disparity, the lower the country's

GDI. India ranks 99th among 130 countries for which the GDI has been estimated.

Even more dismal is India's position in respect of Gender Empowerment Measure (GEM) which is calculated 'on the basis of disparities between male and female share of parliamentary seats, and between male and female administrators, managers, professionals and technicians and male and female earned income'. India's position is 101st out of 116 countries covered; India trails behind countries like Thailand (54th), Indonesia (56th), Nepal (73rd), Sri Lanka (79th) and Bangladesh (80th). The Report states: "Over the past 20 years, doors to education and health opportunities have opened rapidly for women, but the doors to economic and political power are barely ajar" (Quoted in the Statesman, Calcutta for 18 August 1995 and HDR 1995, p. 4).

It is in this context that the provision of reservation of seats in the Panchayat Raj bodies for women need to be endorsed. But more needs to be done. Such statutory obligation for accommodating women should be extended to the cases of state legislatures and the Union parliament in stages.

The concept of sustainable human development highlights the importance of the development of the social sector, that is, improvement in literacy ratio and educational attainment and health services. But the level of development of this sector in India is much behind even many developing countries. In 1992, according to the Human Development Report 1994 (p. 139), adult literacy rate for total population (as % of age 15 plus) was 50, for female population 35 and male population 64. Mean years of schooling (25 plus) for total population was 2.4, for female population 1.2 and for male population 3.5. For the period 1988-92, the position of health infrastructure and services in India was quite below the standard requirement vide, World Development Report, 1993. There were 0.41 doctors per 1000 population, 0.7 hospital beds per 1000 population (against the norm of 1 bed per 1000) and a ratio of 1.1

nurses to a doctor though the optimal requirement is 2 nurses per doctor. India has, therefore, to make much more investment on the development of the social sector than she has been doing so far for achieving cent per cent literacy and higher average years of schooling and substantially improving the status of health infrastructure and services.

Political Content of Sustainable Development

The effective empowerment of the people at the grassroots level to enable them to exercise control over the use of natural resources brings into focus the political content of sustainable development. Anil Agarwal has aptly pointed out (1992) that the achievement of sustainable development is crucially dependent on the society's ability to learn from its mistakes and to rectify them promptly. It is obvious that no society can claim perfect knowledge about the ecological soundness of its management and use of natural resources. Therefore the social and political order should be so structured as to contain the possibility of promptly learning from the mistakes and rectifying the manner of resource use. Such an order can be built up if the decision-making power rests with those who are liable to suffer the consequences of their decisions. The concept of sustainability is, according to Agarwal, thus related to hard political questions like the power structure determining the system of control over resource use and the extent of democracy in the decision-making process. Based on these premises he concludes:

"Sustainability . . . demands the creation of a political order in which, firstly, control of natural resources rests to the maximum extent possible with local communities who are dependent on those resources; and, secondly, decision-making within the community is as participatory, open and democratic as possible. The more this happens, the more we will move towards sustainable development" (*ibid*).

It might be possible to empower the community to have control over resource use and to make open and active participation of the people in the decision making process a reality through the effective functioning of the Panchayat Raj Bodies in India. But there must be the necessary political will for effecting genuine decentralization of power and ensuring adequate flow of investments for the development of the social sector.