

## Politics of Environment — II

By Anil Agarwal

It looks as if environment is an idea whose time has come. Newspapers give prominent display to environmental horror stories. Editorials demand better management of natural resources. Government statements on the need to preserve the environment are commonplace. Government programmes, too, are quite numerous and increasing in number day by day. There are massive schemes for afforestation, for instance. In the last four years, some 1,000 crore seedlings are said to have been distributed or planted. There are new laws for control of air and water pollution and for the conservation of forests. India has been praised all over the world for what it has done to preserve tigers. Nearly three per cent of India's giant land mass is now protected national parks and wildlife sanctuaries, and there are demands to strengthen their protection and increase their area. Plan documents and party manifestoes take care to mention the importance of environment.

But there is a major problem with this entire range of activities and concerns: it does not appear to be based on a holistic understanding of the relationship between environment and the development process in this country. The programmes are ad hoc, without clear priorities, and there is too much of a policeman's attitude. They seem to be based on the belief that concern for the environment essentially means protecting and conserving it, partly from development programmes but mainly from the people themselves. There is little effort to modify the development process itself in a manner that will bring it into greater harmony with the needs of the people and with the need to maintain ecological balance, while increasing the productivity of our land, water and forest resources.

The post-independence political debate in India has centred on two major issues: equity and growth. The environmental concern has added a third dimension: sustainability. India's biggest challenge today is to identify and implement a development process that will lead to greater equity, growth and sustainability.

The environment is not just pretty trees and tigers, threatened plants and ecosystems. It is literally the entity on which we all subsist, and on which entire agricultural and industrial development depends. Development can take place at the cost of the environment only upto a point. Beyond that point, it will be like the foolish person who was trying to cut the very branch on which he was sitting. Development without concern for the environment can only be short-term development. In the long term, it can only be anti-development and can go on only at the cost of enormous human suffering, increased poverty and oppression. India may be rapidly approaching that point.

Amongst the hundreds of voluntary groups working at the micro level in India, there has been a remarkably rapid growth of interest in environmental problems. So rapid has been this growth that sometimes it is loosely described as the beginnings of an environmental movement in the country.

Hundreds of field-level groups today take a keen interest in environmental issues and their experiences and interests are extremely diverse. Some are interested in preventing deforestation. Others are interested only in afforestation. Many want to prevent the construction of one dam or another. There are others who want to prevent water pollution. There is the famous Chipko movement<sup>1</sup> in the UP Himalaya, probably the oldest and most famous of all the groups, which has played a major role in bringing the issue of deforestation to the forefront of public opinion. There is its counterpart in the south, the Appiko movement<sup>2</sup> in the Western Ghats of Karnataka. Dams like the Silent Valley<sup>3</sup> and Bedthi<sup>4</sup> have already been stopped because of strong people's protests, and the well-known social worker Baba Amte is leading a major campaign against the proposed Bhopalpatnam and Inchampalli dams<sup>5</sup> on the borders of MP, Andhra Pradesh and Maharashtra. The Kerala Sastra Sahitya Parishad<sup>6</sup> has had a long acrimonious battle over the pollution of the Chilyar

river in Kerala by a rayon mill. The India Development Service finds itself embroiled in another case of river pollution by a rayon mill in Karnataka<sup>7</sup>. Meanwhile, the Shahdol Group has worked against the pollution of a river in Shahdol district by a paper mill<sup>8</sup>. There is, also, the Mitti Bachao Abhiyan<sup>9</sup> to organise farmers against water-logging caused by faulty irrigation systems.

While all these are relatively well known groups and have attracted varying degrees of media attention, there are many others which are doing excellent work in mobilising people, both to prevent further ecological destruction, often in the face of determined government policies, and to bring about ecological regeneration. One thing, however, that binds most of these groups is their concern to put the environment at the service and the control of the people, the people usually being defined as the local communities who live within that environment.

Environmental protection *per se* is of least concern to most of these groups, including the well known Chipko movement, for example. Their main concern is about the use of the environment: how should the environment be used and who should use it and benefit from it. It is this growing understanding of the relationship between the people and their environment, born out of a concern for a more equitable and sustainable use of the environment, that is probably the most fascinating development in India today.

### **Environmental destruction by the rich**

To understand the nature of the environmental problems in India, it may be useful to compare and contrast certain environmental trends and concerns in India with those in the West, especially since the environment crusade began in the West and since many groups in India, including political parties, have for long dismissed it as a petty Western concept. The argument has always been that too much concern for the environment can only retard economic and industrial development.

The UN Conference on the Human Environment held in Stockholm in 1972 was the landmark conference that created worldwide consciousness about environment. No UN conference has ever been able to collect so many luminaries at one place.

Many delegations from developing countries had argued that the solution to environmental problems lay in economic development. "Smoke is a sign of progress," the Brazilian delegation had thundered, then representing a country witnessing an economic boom. India's Prime Minister Indira Gandhi, who made a major impression on the conference, is still remembered for her oft-quoted statement: "Poverty is the biggest polluter." In all those who came from the Third World, both leftists and rightists, there was a sneaking suspicion that the Western countries were up to some trick. The West may simply be pushing the environmental concern onto an unsuspecting Third World to retard its technological modernisation and industrial development. It was even argued that having got their riches and their affluent lifestyles, Westerners were now simply asking for more affluence: clean air, clean water and large tracts of nature for enjoyment and recreation, many of which were going to be preserved in the tropical forests and savannas of Asia, Africa and South America.

But exactly 10 years later when the UN organised a meeting to commemorate the Stockholm conference, few non-governmental groups from the Third World were prepared to argue in favour of the development process as it is. The Third World today faces both an environment crisis and a development crisis, and both these crises seem to be intensifying and interacting to reinforce each other. On one hand, there does not seem to be any end to the problems of inequality, poverty and unemployment, the crucial problems that the development process is meant to solve. On the other, environmental destruction has grown further apace. But what is interesting is that while many environmental problems, especially those related to air and water pollution have tended to become less severe in many parts of

the industrialised world, because of the introduction of highly capital-intensive pollution control technologies, these problems have continued to grow and become critical in many parts of the developing world. In other words, while the economic development process in the world is only worsening our environmental problems, it is tending to solve them in the West. Michael Heseltine, then minister of environment in the anti-environment British government of Margaret Thatcher, even went so far in a UN meeting in 1982 as to say that all environmental problems in the West have been solved and they now remain mainly in the Third World!

Heseltine, indeed, had a point. London, for instance, has not seen for years any of those smogs it saw regularly in the 1940s and '50s, which led to thousands of deaths, and the Thames now even boasts of salmon. But Michael Heseltine, like all representatives of vested interests, was only hiding something of deep significance: the role of the Western world in destroying the Third World's environment.

Very simply speaking, the major environmental problems in the West are those arising out of waste disposal — problems of air and water pollution and of disposal of highly toxic industrial and nuclear wastes. Though problems of acid rain have definitely increased and there does not yet seem to be any solution to the problem of toxic wastes, it is true that some cities and rivers do look cleaner.

In the Third World, however, as its own industrialisation proceeds, these waste disposal problems are getting worse day by day but they are still not the major or the only environmental problem. In the Third World, the major environmental problems are those which arise out of the misuse of the natural resource base: the soils, forests and water resources. These problems are created to a great extent because of the pressure to produce raw materials for modern industry. The Third World's environment not only provides raw materials for its own industries but also for the industries of the West.

For instance, the Japanese and Western timber industries have been the biggest source of forest destruction in Southeast Asia. Having turned countries like Thailand from net exporters into net importers of wood, Japanese companies are now turning to the last great wooded frontier of the world: the Amazon basin of South America.<sup>10</sup>

### **Feeding the rich**

The food needs of the Western world have played equal havoc with the lands of the Third World. No statistics on this are available, but if someone did collect them, we will definitely find that despite the worldwide process of decolonisation, there is today many times more land being used in the developing world to meet the food and other biomass needs of the Western countries than in the 1940s, before the process of decolonisation began. More than a quarter<sup>11</sup> of all central American forests have been destroyed since 1960 for cattle ranching<sup>11</sup>: 85 percent to 95 percent of the beef produced as a result has gone to the US while domestic consumption of beef in central America has fallen dramatically. In the US, this beef has been mainly used to make tinned and pet foods and cheap hamburgers because central American beef is half the price of the grass-fed beef produced in the US. The price of central American beef does not represent its correct ecological cost. Cattle ranching has proved to be the worst form of land use for the fragile soils on which these tropical moist forests existed. Within five to seven years, their productivity has dropped dramatically and cattle ranchers have had to move on.

The Sahelian drought of 1968-74 in Africa which grabbed world headlines and claimed the lives of approximately 100,000 nomadic people, was caused by the French colonial policy to drive the region's countries into peanut farming to secure its own source of vegetable oils.<sup>12</sup> Through heavy taxation policies, the French colonial authorities forced west African peasants to grow groundnuts at the expense of subsistence crops. Groundnut cultivation rapidly depleted the soil. It soon spread to traditionally fallow and forest zones and

encroached on land previously used for grazing, upsetting the delicate balance between the farmers and nomadic herders. The expansion of groundnuts was encouraged by artificially high prices but when US soya production began to hit the European market and vegetable oil prices began to fall, the newly independent west African countries had no alternative but to increase area under groundnut to keep up their foreign exchange reserves. As this area increased by leaps and bounds under the pressure of government policies, the nomads were slowly pushed further and further north into the desert, something for which they were not prepared, their traditional relationships with the settled farmers having been totally disturbed. When the long period of drought set in and thousands of animals and human beings began to die, the nomads and their overgrazing was blamed. Nobody blamed the French or the Sahelian elite which worked hand-in-glove with the French.

The UN Environment Programme (UNEP) in a recent report points to the impact of the heavy debt burden of the Third World and high interest rates in the West on the environment of the Third World.<sup>13</sup> The debt burden and regressive terms of trade have forced many developing countries to put enormous pressure on their natural resources, sometimes even to the point of overexploitation. In 1981, for instance, it took one Latin American country 9.8 times as much beef to buy a barrel of oil as it did in 1981. At the end of the 1970s, profits from the export of one tonne of bananas were enough to purchase only half the steel they would have bought at the end of the 1960s. When interest rates are high, there is a tendency to discount long-term issues like environment for short-term gains. A one per cent increase in interest rates adds approximately US \$5 billion to the current debt burden of developing countries. To have increased its export earnings (not profits) by \$1 billion in 1981, South America as a whole would have had to increase its banana exports three-fold, Ecuador three-fold and Colombia ninefold, while leading cotton exporters like Egypt and Turkey would have had to double and triple their cotton exports respectively. This would have meant bringing millions of additional hectares into production to grow these export crops. And, it can be added, this would have pushed millions of marginal peasants into marginal lands like desert fringes and steep hill slopes for their survival, leading to accelerated desertification and soil erosion.

In our own country, the first major attack on the forests of the northeast came with the establishment of tea plantations. Destruction of forests goes on for coffee and other export crop plantations even today. The current overfishing on India's coasts, as on the coasts of almost all Southeast Asian countries, is taking place because of the heavy demand for prawns in Western and Japanese markets. This overfishing is leading to considerable tensions between traditional fisherfolk and trawler owners, and violent encounters between the two are regularly reported.<sup>14</sup> Recently, Indonesia completely banned the operation of trawlers in its coastal waters and several countries, including India, have decreed regulations to prevent trawler operators from fishing in the first few kilometres from the coast. This zone is reserved for traditional fisherfolk. But policing trawlers over such an extensive coastline is an expensive proposition and regulations are, therefore, seldom observed or enforced. The export of frog's legs to cater to the palates of Western consumers and its impact on the agricultural pest populations in affected areas is now an old story.<sup>15</sup> Fortunately, India not being a major export-oriented country, there are not many such examples.

But the pattern of environmental exploitation by industry that we see on the global scale simply reproduces itself on the national scale in India. What Western industry does to the Third World environment, Indian industry does to the Indian environment. Just to get an idea of how heavily dependent modern industry is on the natural environment, it may be useful to point out that nearly half the industrial output in India is accounted for by industries which can be called biomass-based: that is, industries like cotton textiles, rayon, paper, plywood, rubber, soap, sugar, tobacco, jute, chocolate, food processing and packaging, and so on. Each of these industries exerts an enormous pressure on the country's cultivated and forest lands. They need crop lands, they need forests, and they need energy and irrigation.

The Indian paper industry has ruthlessly destroyed the forests of India. Paper companies in Karnataka, having destroyed all the bamboo forests, are now getting their raw materials from the last major forested frontier of India: the northeast.<sup>16</sup> The government's own public sector paper companies are coming up in the northeast itself. The Andhra Pradesh government has meanwhile set its sights on the forests of Andaman and Nicobar Islands for the paper mill that it wants to build in Kakinada. A leading soap manufacturer has proposed that the Great Nicobar Islands be denuded to plant palm oil. The shortage of raw materials for wood pulp has already forced the government to liberalise import of pulp for the country's paper industry, thus adding to the pressure on the forests of other Third World countries.<sup>17</sup>

One lesson is, therefore, clear: the main cause of environmental destruction in the world is the demand for natural resources generated by the consumption of the rich (whether they are rich nations or rich individuals and groups within nations) and because of their gargantuan appetite, it is their wastes mainly that contribute to the global pollution load.

### **The role of science and technology**

If we want to see this process of 'resource colonisation' in a historical light, we can trace it back to the beginnings of the industrial revolution. The cultural diversity that existed in the world at that time was no historical accident. It was born out of the world's biological diversity and people's ability to shape a society with the use of that biological diversity. People came to adopt a lifestyle that was in harmony with the dictates of the immediate environment. Those who lived in the deserts practised nomadism and those who lived in the hills practised shifting cultivation. Houses and cities built with local materials and skills were built differently to satisfy the conditions set by the local climate.

But as modern science and technology grew, it gave people enormous power. Unfortunately the new knowledge created by scientific and technological development fell on an highly unequal world, where access to this knowledge was and still is, unequal, and the infrastructure to use it very uneven. The major result of scientific and technological development, embedded as it is within an unequal global society, is that it has given few people more and more power to exploit resources from further and further away. First, distant lands (distant ecosystems) were turned into colonies for resource exploitation; when decolonisation took place, multinational corporations took over the role of global resource exploitation and management within a framework of liberal international trade; and now it is the turn of such hitherto unfathomable global commons as the deep sea bed, Antarctica and space to be exploited. The UN even has a committee to discuss resource exploitation on the moon.

But at least on the terrestrial level, with hardly any uninhabited frontiers left, this relentless search for resources from others' ecosystems can only mean extraordinary conflict. In a more and more densely populated world, that which is a resource in a distant ecosystem for one human being is simply a resource within someone else's immediate ecosystem. If that someone's very survival is dependent on the resources of the immediate ecosystem, then there will be conflict, and resource colonisation by the powerful will end in the dispossession and impoverishment of the less powerful, in their own homeland, so to say.

These trends raise serious doubts about the sustainability of the Western industrialisation model based on global management of resources for the consumption of a few. The growth of science and technology has indeed been humankind's most magnificent achievement but definitely not the ends to which this knowledge has been used.

The most unfortunate part of this process is that we have now got a large number of consumers in the world whose consumption is highly destructive of the environment but who cannot perceive this destruction psychologically. These are consumers of distant resources: those who have access to all the fruits of modern science and technology. Just imagine a

resident of Delhi who uses shirts made of cotton which has been produced in a field in Maharashtra heavily sprayed with pesticides leading to multiple resistance in mosquitoes; electricity from a dam in the Himalaya that has destroyed forests and blocked migration of fish; paper produced in Madhya Pradesh by a factory that has polluted the local river and logged forests in an ever-widening circle, disrupting the life of tribals; cereals from Punjab where food is produced using a technology that drains soil fertility, and so on. It is humanly impossible for such distant consumers to appreciate what their purchasing power is doing to distant areas.

Just imagine, then, the situation of the Western consumer whose beef and fruits come from Latin America and Africa, peanuts from west Africa, coffee from east Africa, tea from India, prawns from Asia and timber from all over the world. But what is probably worse is that such consumers, no longer dependent in any crucial sense on the immediate environment for their consumption needs, slowly become oblivious of the destruction even of the immediate environment. Thus, we get a world economic system in which individuals with power have almost no interest in the fate of their environment, distant or immediate — and only a global environmental crisis, situated amidst a sea of economic poverty, has been able to evoke some concern, and we still talk of the need for environmental education in a big way. Modern science and technology is not always used as a brutish tool by the rich and powerful to dispossess the poor. It has also been used subtly to undermine the confidence of the poor in their own resources and resource-use patterns. Particularly, if a natural resource used traditionally by people is so widely available that it just cannot be monopolised, every effort is made in the name of scientific progress to discredit that natural resource as archaic and useless. This drive to discredit a resource is undertaken to the extent that even the poor who often have no alternative except to use that resource, look forward to the day when they can do without it.

The classic example is mud. Over half the world's population lives in mud structures. Prices of cement and bricks required for modern buildings continue to rise, being extremely energy intensive, faster than the purchasing power of the world's poor. The chances of all mud dwellers ever moving from their buildings is pretty low, at least not in the next 50 years.<sup>18</sup>

The majority of the urban population in the Third World cannot afford even the cheapest modern housing (about us \$500-\$3,000). In most cities of the developing world, including India, the portion of the population living in slums and squatter settlements has been rising rapidly. Unable to meet the housing needs of the relatively small urban populations, the governments of the Third World have not even dared to launch housing programmes for rural areas, where the majority of the population lives.<sup>19</sup>

The importance of traditional building materials to meet the needs of the world's population is ignored by housing authorities everywhere, and their use is never taught to architects or civil engineers. Mud homes are synonymous with extreme poverty, so much so that they are despised even by the poor and virtually every effort to introduce improved mud housing has failed.

While architects and civil engineers only neglect mud, medical professionals adopt an extremely hypocritical attitude towards herbal medicine. The majority of drugs available on the US market today, for instance, are plant-derived (that is, the drugs were either made directly from a plant-based raw material or they were first discovered in a plant before a chemical company began to market their chemical analogues).<sup>20</sup> Drug companies take great care to screen herbs for pharmacological properties. The moment an useful herb is discovered, the company tries to identify the active ingredient and develop its chemical analogue. This is produced, packaged and marketed and prescribed by the medical profession.

Yet doctors dismiss herbal medicine as outright quackery and make no effort to study medical systems based on herbal medicine.<sup>21</sup> Drug companies make no effort to promote herbs directly. Colonial authorities in Africa had even outlawed the practice of herbal medicine. These administrations had such an effect on the colonised cultures that even after independence, many African countries continued to ban the practice of folk medicine, still the only real option available to a large part of the world's people.

Even more dramatic is the process by which commercial and scientific propaganda has been used to discredit a readily available resource like breast milk, and promote commercial substitutes.<sup>22</sup> Now scientific studies show the superiority of breast milk, but it took a long campaign to formulate appropriate public policies to protect breast milk and even today, vested interests oppose these policies.

### **The poor and their environment**

The above discussion makes it clear that it is the poor that are affected the most by environmental destruction. The field experience of voluntary groups confirms that eradication of poverty in a country like India is simply not possible without the rational management of our environment and that conversely, environmental destruction will only intensify poverty. Environmental destruction goes hand-in-hand with social injustice. A major reason for this is seldom recognised. The vast majority of the rural households meet their daily household needs through biomass or biomass-related products, which are mostly collected free from the immediate environment. In short, they live within nothing other than a biomass-based, subsistence economy. Food, fuel (firewood, cowdung, crop wastes), fodder, fertilisers (organic manure, forest litter, leaf mulch), building materials (poles, thatch), herbs and clothing are all biomass products. Water is another crucial product for survival. Water is not biomass itself, but its availability is closely related to the level of biomass available in the surrounding environment. Once the forest disappears, the local pond silts up, the village well dries up, and the perennial stream gets reduced to a seasonal one. The water balance gets totally upset with the destruction of vegetation; in a monsoon climate like ours with highly uneven rainfall over the year, this means greatly increased runoff and floods during the peak water season and greatly increased drought and water scarcity in the lean dry season. There is reason to believe that the number of 'problem villages' from the point of view of availability of drinking water may be increasing.<sup>23</sup>

The magnitude of India's dependence on biomass for meeting crucial household needs can be appreciated by looking at the energy situation. We as Indians love to point out that India is the world's 10th largest industrial power, or something like that. But even then, over 50 per cent of the fuel consumption in India is for such a fundamental survival activity as cooking.<sup>24</sup> In developed countries, cooking accounts for less than 10 per cent of total national fuel consumption.

Equally important for India is the fact that 90 per cent of the cooking fuel in India is biomass: that is, firewood, cowdung and crop wastes. Even urban households are heavily dependent on firewood as fuel. Few people, energy planners and government officials alike, had any idea until recently of the dimensions of the rural-urban fuelwood trade. Annual urban purchases of fuelwood are well over Rs 500 crore in India.<sup>25</sup> Over the last 10 years, Madhya Pradesh, the only state left in the heart of India with any reasonable degree of forest cover, has emerged as major supplier of fuelwood to the cities of northern and western India. But as the state gets more and more deforested every year, fuelwood prices have been rising within Madhya Pradesh itself. Madhya Pradesh has now become India's first state and probably the world's first state too, to ban the export of firewood.<sup>26</sup> As a result, Delhi, which uses about Rs 15 crore worth of firewood on the retail market, is now getting less firewood, and an increasingly higher proportion from as far away as Assam, the same place from which paper mills are now getting their bamboo.

Firewood prices in Delhi are today higher than ever before and according to FAO figures, are among the highest in the world. This firewood is used by the poorest of the poor in Delhi, by construction workers and others. When the effective heat provided by firewood is compared to kerosene, because of the low efficiency *chullhas* in which firewood is used, firewood becomes four to five times more expensive than kerosene. LPG, incidentally, a fuel used by the richest sections of the society and supplied entirely by government sources, is the most convenient and cheapest fuel available. Which state will become the next to ban firewood exports is anyone's guess. What happens when Assam also says no?

Biomass resources not only meet crucial household needs but also provide a range of raw materials for traditional occupations and crafts and are, hence, a major source of employment: firewood and cowdung are important sources of fuel for potters; bullock carts and catamarans are made from wood; bamboo is a vital raw material for basket weavers, and so on. Traditional craft are not just being threatened by the introduction of modern products but also by the acute shortage of biomass-based raw materials. A study from the Indian Institute of Science — the first in India on the changing market for bullock carts — reports that people in Ungra village in Karnataka can now longer afford to buy new bullock carts with the traditional wooden wheel because wood has become extremely expensive. A recent report from the Murugappa Chettiar Research Centre from Madras says that traditional fisherfolk now find it very difficult to make new catamarans because the special wood they use is extremely scarce and expensive.<sup>27</sup>

Several reports from all over the country — from Madhya Pradesh, from Maharashtra, from Tamil Nadu — portray the extreme difficulty of hundreds of thousands of basket weavers in eking out an existence because of the acute shortage of bamboo. In the Bhandara and Chandrapur districts of Maharashtra, nearly 70,000 mat and basket weavers have been protesting against the discriminatory prices and small quota of bamboos given to them whereas big paper mills have been leased large bamboo forests.<sup>28</sup>

In Karnataka, Madhav Gadgil undertook a study of the use of the state's bamboo forests by paper mills, after a series of protests by basket weavers. Gadgil found that whereas bamboo was available to paper mills at Rs 15 a tonne, it was available to basket weavers and other small bamboo users in the market at Rs 1,200 a tonne.<sup>29</sup> Social activists in Saharanpur have pointed out the travails of the baan makers who have now been deprived of their earlier sources of *bhabhar* grass. The Uttar Pradesh Forest Development Corporation discriminates in favour of paper mills and this policy has turned thousands of these baan workers into destitutes, landless labourers and urban migrants.<sup>30</sup> Wood is now difficult to get for making even agricultural implements like the plough, especially wood that has been traditionally used for these implements. Few people know that one of the things that led to the Chipko movement was the anger of the local people over the forest department's refusal to provide ash wood, wood that has been traditionally used for making ploughs, whereas the forest departments happily allocated the same wood to sports goods manufacturers. Even biomass resources like thatch have become so scarce that maintenance and repair cycles of mud-and-thatch huts have increased considerably. A government report from Bastar, of all places, as it is still one of the heavily forested districts in the country, points to a village where no new hut has been built over the last two decades because the entire area around the village has been deforested.<sup>31</sup> Traditional mud roofs have almost disappeared from many parts of the country because of the large quantities of timber needed by them. They are being replaced by tiled roofs, but baking tiles still requires large quantities of firewood.

Fodder is another vital resource that is in acute shortage. With only 2.45 per cent of the world's land mass, India supports 15 per cent of its cattle, 52 per cent of its buffaloes and 15 per cent of its goats, and these animals play an extremely important role in the integrated system of agriculture and animal husbandry that Indian farmers practise.<sup>32</sup> Shortage of fodder, especially from public lands, means, as a study from the tribal areas of Gujarat



shows, poor landless households and marginal farmers do not benefit much from the milk cooperatives and animal improvement schemes in the region.<sup>33</sup>

In such a situation where millions of people are heavily dependent on biomass sources for their daily existence, the destruction of the environment or any policy that reduces access to biomass resources like the proposed Forest Bill and Forest Policy, will have an extremely adverse impact on the daily lives of the people.<sup>34</sup>

### **The transformation of nature**

Nature is not just being destroyed. Nature is also being steadily transformed. There are two major pressures operating on the country's natural resources today. The first, generated by population growth and thus increased household demand for biomass resources, has been widely talked about. The poor often get blamed for the destruction of the environment. But the second set of pressures, generated by modernisation, industrialisation and the general penetration of the cash economy, are seldom talked about, at least in policy-making circles.

Modernisation affects nature in two ways. Firstly, it is extremely destructive of the environment in its search for cheap biomass-based raw materials and in its search for cheap opportunities for waste disposal. Unless there are strong laws which are equally strongly implemented, there is no attempt made to internalise environmental costs and both public and private industrialists prefer to pass them on to society. State governments are also happy to give away large tracts of forests for a pittance and throw water pollution control laws to the winds to get a few more factories.<sup>35</sup>

Secondly, modernisation is steadily transforming the very character of nature. In physical terms, the tendency is to reduce the diversity in nature and transform it into a nature that is full of high-yielding monocultures. The driving force for this transformation arises out of the commodification of nature. Whether it is a herd of cattle, a pond, a forest or an agricultural field, the attempt is to reduce diversity and promote the most high-yielding gene for maximum profit and production, the first more so in capitalist systems and the latter probably more in socialist systems. The long-term sustainability of the new system is seldom considered. The ecological role of the original nature is usually disregarded while transforming it.

In social terms, the transformation is generally away from a nature that has traditionally come to support household and community needs — and the culture that had come into existence on its basis — and towards a nature that is geared to meet urban and industrial needs, a nature that is essentially cash generating. Excellent examples of such transformations are the pine forests in place of the old oak forests in the Himalaya,<sup>36</sup> the teak forests in place of the sal forests in the Chotanagpur plateau,<sup>37</sup> eucalyptus plantations in place of natural forests in the Western Ghats and now the proposals to grow oil palms in place of the tropical forests in the Great Nicobar Islands. Both these phenomena — the destruction of original nature and the creation of a new nature — have been taking place simultaneously in the Indian environment on a massive scale.

The effect of the massive environmental change taking place in India has been disastrous for the people of India, especially when we realise that India is a country with an extremely high level of poverty on one hand and a reasonably high level of population density on the other. There is hardly any ecological space left in the physical environment today which is not occupied by one human group or another for its sustenance. Now, if in the name of economic development, any human activity results in the destruction of an ecological space or in its transformation which benefits the more powerful groups in society, then inevitably, those who were earlier dependent on that space will suffer (see box for European history).

Let us look at a few cases of how the destruction of nature has affected the lives of people in India. One very dramatic area where government policies have consistently increased

conflict is forests. The entire tribal population, and millions of other forest dwelling people, depend on the forests for their very existence. Destruction of forests has meant the social, cultural and economic destruction of the tribal populations in particular. Beginning with the British and continuing with free India, the government has decided to control the forest resource itself, leaving little or no control in the hands of the forest dwellers.<sup>38</sup> Government control over forests has definitely meant a reallocation of forest resources away from the needs of local communities and into the hands of urban and industrial India. The end result is both increased social conflict and increased destruction or transformation of the ecological resource itself.

Yet another major component of the country's physical environment is grazing lands. The destruction of the grazing lands has meant enormous hardships for poor people, especially for the nomadic groups in the country. Few people know that India has nearly 200 castes engaged in pastoral nomadism, which add up to nearly six per cent of India's population. India is unique in the world in terms of the diversity of animals associated with pastoral nomadism. There are shepherds of camels in Rajasthan and in Gujarat, of donkeys in Maharashtra, of yaks in Ladakh, of pigs in Andhra Pradesh, and even of ducks in south India. Sheep, goats and cattle are of course the main nomadic animals.

A number of factors, including land reforms and development programmes which have promoted expansion of agriculture to marginal lands, have steadily led to an erosion of grazing lands. The Rajasthan canal is a fine example of a government programme that has transformed extensive grazing lands into agricultural lands.<sup>40</sup> No effort was made by the government to ensure that the nomads who used these grazing lands earlier would benefit from the canal on a priority basis. In almost every village, the *panchayat* lands, traditionally used as *gauchar* lands, have been encroached upon by powerful interest groups and privatised. Nomadic groups have been increasingly impoverished over the last 30 years and an ever-increasing number is being forced to give up their traditional occupation to become landless labourers or urban migrants.

Riverine fisherfolk constitute another group that has suffered immensely with environmental destruction. Riverine fisheries are being seriously affected by the construction of dams which affect migratory fish and by increasing water pollution.<sup>41</sup> Largescale fish kills are regularly reported. Rivers have now become a resource for urban and industrial India to be used as cheap dumpyards for their wastes and all this is sanctioned in the name of economic development.

In the 158-km stretch of the Hooghly, the average yield of fish is just about a sixth in the polluted zones as compared to the unpolluted zones. Growing water pollution is thus affecting thousands of riverine fisherfolk in the country, but little data is available on their plight. Inland fish production data shows a steadily rising trend, but what this data reveals is less than what it masks. The increase is coming mainly from aquaculture, a technology that only those with sufficient capital and land can benefit from. Meanwhile, those poor fisherfolk who depended on access to a common property resource like a river for their livelihood suffer from its degradation.

The new commercial nature that is being created is of little help to village communities and their daily needs. There are people's protests in many parts of the country against the conversion of oak forests into pine forests and of sal forests into teak forests. Neither pine nor teak is of any interest to local communities. In the Singhbhum area of Bihar, there is even a movement to destroy the new teak forests. Equally, there is a strong protest in Karnataka against the planting of eucalyptus on farmers' fields.<sup>43</sup>

The planting of eucalyptus on farmers' fields and even on so-called barren fields is an excellent example of the adverse biomass conversion, harmful for the people, promoted by modernisation. What happens to the poor people when eucalyptus is planted on a farmer's

field? We have a concrete example from a village in Punjab, where a rich farmer, a former governor, with over 100 ha of land has stopped growing cotton and has switched to eucalyptus. As long as he grew cotton, enormous quantities of cotton sticks would be available for the landless labourers in the village to use as fuel. Because of the shortage of firewood, crop wastes from the landlords' fields are the major and often the only source of fuel for these poor landless villagers. Now with eucalyptus growing, their main source of fuel has dried up, putting them in a precarious position. This is a case where afforestation has actually created a fuel famine for the neediest community.

What happens when eucalyptus is grown on a barren piece of land? Usually no land is barren unless, of course, it is highly eroded, in which case even eucalyptus cannot be grown on it. Generally, barren lands have large quantities of weeds growing on them. With the destruction of our original vegetation, a few aggressive weeds like *Lantana*, *Parthenium* and *Eupatorium* have literally started taking over the country. None of these weeds are palatable to animals and they, therefore, survive the pressure of grazing.<sup>44</sup>

If we look at the firewood statistics in the country, we find there is a huge gaping hole in them. The officially produced firewood does not account for even a fifth of the total estimated demand of some 130 million tonnes of firewood a year. When this was first discovered in the early 1970s, it was immediately concluded that the rural people were stealing wood from the forests on an enormous scale. Later, however, it was found that over three-quarters of the fuel used in the rural areas is in the form of twigs and little branches and there need not be any felling of trees to get this wood. But even today, we do not know what vegetation is actually providing this massive quantity of twigs and branches. My guess is that weeds are now playing an extremely important role in the vital supply of cooking fuel for the poor.

A weed is defined as a plant which has no economic value but in the socio-economic reality of India, *Lantana*, *Parthenium* and *Eupatorium* are weeds only for the revenue-earning forest departments of the government. For poor households who have no lands of their own, weeds growing on public lands are extremely useful because of the very fact that they are not wanted by the modern sector of the economy. Once they acquire an economic value, they will go out of their hands — like bamboo, which was for long described as a weed by foresters.

Thus, when a patch of barren land is planted with eucalyptus, even the weeds are no longer available to poor, landless households and their fuel crisis intensifies. Not surprisingly, foresters report from all over the country, in the form of a complaint, that women even take away dry eucalyptus leaves from eucalyptus plantations for use as fuel, thus destroying, the foresters say, any chance of the leaves breaking down into humus and enriching the soil. But what else can these energy-starved women do?

What we see in India today is growing conflict over the use of natural resources and, in particular, over biomass between the two sectors of the country's economy; the cash economy (or the modern sector) on one hand and the non-monetised, biomass-based subsistence economy (the traditional sector) on the other.

As the growing stock of biomass goes down and the demand for biomass from the cash economy goes up and finally demand begins to exceed supply, pressure to exploit the remaining biomass increases enormously; biomass prices rise, and destructive processes accelerate because of market forces. Illegal timber felling is today a major activity in the country, undertaken with the full support of political interests.<sup>45</sup> Stealing a few dozen trucks of timber is the surest and easiest way to become rich. No less a person than a chief minister — the well-known Ram Lal of Himachal Pradesh — recently had to resign because of his family's involvement in timber smuggling.

As even those forms of biomass that are used by the poor become commercialised, the access of the poor to those biomass sources gets automatically reduced because of limited purchasing power. The trend towards commercialisation of firewood has been so rapid in the last 15 years that it is now rare to find poor households using much firewood, especially in the shape of logs. Firewood is no longer a fuel of the poor but of the relatively rich.<sup>46</sup> The poor now subsist on qualitatively inferior sources of biomass fuels: crop wastes, weeds, twigs, cowdung and whatever organic *kachra* (waste) that they can find. In fact, if one goes to a village, one will see that even firewood, crop wastes and cowdung are fuels used according to the family's economic status — crop wastes usually being at the lowest end of the pecking order.

Unfortunately, several scientific agencies, thinking that 'crop wastes' are actually wastes, have begun to undertake research on their commercial utilisation. Technologies like fuel briquetting plants and smallscale paper mills based on crop residues are being heavily promoted by the government. This raises prices of fuel and fodder and directly hits poor landless peasants, who now have to rely heavily on the mercy of landed farmers to allow them to take these wastes away, which they will do only as long as they are non-commercial entities for them.

In fact, in many parts of Haryana and Punjab, farmers are already insisting that crop wastes be taken by their labourers in exchange for wages. In one district of Haryana, it was found that a common practice now is to let a woman pick an acre of cotton in exchange for the cotton sticks from that acre. There is no additional payment.<sup>47</sup> The commercialisation of biomass and its drain towards those who have the power to purchase will inevitably harm the poor and erode the non-monetised, biomass-based subsistence economy.

### **Environment and women**

The destruction of the environment clearly poses the biggest threat to marginal cultures and occupations like that of tribals, nomads and fisherfolk which have always been heavily dependent on their immediate environment for their survival. But the maximum impact of the destruction of biomass sources is on women. Women in all rural cultures are affected, especially women from poor landless, marginal and small farm families.<sup>48</sup> Seen from the point of view of these women, it can even be argued that all development is ignorant of women's needs at best, and anti-women at worst, literally designed to increase their work burden.

Given the culturally accepted division of labour within the family, the collection of household needs like fuel, fodder and water is left to women. As the environment degrades, and this collection work becomes increasingly difficult, women have to spend an extraordinary amount of time foraging for fuel, fodder and water in addition to household work, agricultural work and caring for animals. There is almost no data which shows how the time spent by women on their daily household activities is increasing and how this increase differs across different eco-climatic zones of India. But the data that is already available on the existing work burden is downright shocking. In many parts of the country, women may have literally reached the end of their 'carrying capacities'.

The worst situation is in the arid and semi-arid parts of the country and in the hill and mountain villages. In all these areas, trees and forests have been steadily destroyed. Because of a number of factors — soil and climatic conditions, very small land holdings, lack of irrigation, etc — the Green Revolution has also not reached these areas unlike Punjab and Haryana, where trees are few but where the Revolution has meant an enormous increase in biomass from croplands. As a result, there is now an acute biomass famine in these areas. In all such areas women can spend as much as five to six hours every day — in some households as much as 10 hours every day — just collecting fuel and fodder. On the contrary, in a state like Kerala, where tropical eco-climatic conditions permit a rich green cover, the work burden of women is much smaller — probably the least in the

country. Even the minimal land reforms in which landless families have been given a 10th of an acre, has meant access to a few dozen coconut trees, which helps to provide at least half the fuel requirements.

But in the rest of the country, with deforestation, the increasing work burden on women is affecting everything else in their lives. Women do not even have time to seek health care when they are ill or take rest for few days after a tubectomy operation. A study by the Operations Research Group in western Uttar Pradesh found that even pregnant women work for 14 hours a day. They do this almost till a few hours before the delivery and begin normal work three to four days after the birth.

Just as deforestation affects women most, laws that prevent access to biomass, like the proposed Forest Bill which provides inordinate powers to forest officials, will mean maximum oppression of women: increased demands for bribes and harassment.

The penetration of the cash economy is also affecting the relationship between men and women in a peculiar way and is creating a real dichotomy in their respective relationships with nature. Men have become more involved with the cash economy than women. Women continue to deal with the non-monetised, biomass-based subsistence economy of the household. Even within the same household, we can find cases of men happy to destroy nature to earn cash even though it would create greater hardships for the women in collecting the daily fuel and fodder needs.

The Chipko movement has given us numerous examples of this dichotomy in male-female interests. Even the Chipko experience with afforestation confirms this dichotomy and stresses the role of women in ecological regeneration. Even though many crucial household needs could be met by rehabilitating the local village ecosystem — by planting fuel and fodder trees, for instance — the men do not show much interest in doing so. It is the women who are doing most of the afforestation work organised by the Chipko movement.<sup>49</sup>

The new culture created by the penetration of the cash economy has slowly but steadily alienated the men psychologically from their ecosystem. Employment for them means work which can bring in cash. Since employment can be found mainly in the city, there is mass male migration. But even when the men are in a village, a job is still something that earns cash. If such jobs are not available they prefer to remain unemployed and do little to enrich the local ecosystem. The modern economic system is teaching them that household needs can be met only by earning cash, unlike women, who find that in their daily reality, many vital needs are still collected as a free good.<sup>50</sup>

There are few of those caste and class barriers in the Himalayan villages which prevent people from working together as a community. But still women continue to walk miles and miles to fetch fuel, fodder and water every day, while men do little to plant trees in the denuded areas around them. This psychological and economic marginalisation of men greatly helps to expand the availability of cheap labour to the cash economy.

It is not surprising that the eucalyptus-based social forestry, trotted out to be such a great success by the World Bank and the forest departments, is all in the hands of men, all planting trees with the cash motive.<sup>51</sup> Other than employing women as cheap labour in nurseries, these agencies have nothing to show in terms of involvement of women — the very people who deal with fuel and fodder — and the government still calls it social forestry. But maybe this should not be surprising. Making a fast buck, even at the expense of society and ecology, is probably the most social thing that the World Bank can teach us in a cash economy.

Male migration — another major phenomenon in modern society — also seems to be increasing the work burden of women, who then have to take care not only of household

needs but also have to devote more time to the family's agricultural fields. But as the time needed to collect fuel and fodder grows, agriculture must get neglected. As time for fuel and fodder collection grows and firewood becomes scarcer, the traditional practice of manuring fields will also be given up. Cowdung will be used as fuel, as in the plains, but with the lack of manuring, these fragile hill soils will be exhausted very soon. It will be a disastrous situation both for the local people and the environment. Already in Ratangiri district, a major source of male workers for the city of Bombay, an enormous amount of cultivable land lies fallow. In this way, women from migrant households suffer a double exploitation: that of their own and of their husbands, who are not given enough of a wage to keep a household together. While the husband sweats for a pittance in the town, the wife keeps the household going in the village by collecting free goods from nature and by working harder on the family farm or as a farm labourer.

Because of the increasing incidence and intensity of floods, there has been considerable talk in recent years about integrated watershed management in the Himalaya and in the Ghats. The Himalaya is being described as one of the most threatened ecosystems in the world, which in turn determines the fate of several hundred million people in the Indo-Gangetic plains. But if any action for ecological reconstruction has to be taken in the hills, it cannot be done without the involvement of women. The census data of 1981 shows that all the districts in the country which have high rates of female work participation are situated in the Himalaya or in the Ghats. In the Himalaya a very high proportion of women workers are also classified as cultivators. Therefore, any programme which aims at ecological rehabilitation in these areas will have to involve heavily overworked women unless, of course, labour is brought into these areas from outside, which will create tensions of another kind.

Fortunately, the experience of the Chipko movement shows that women in these parts, despite their 14 to 16 hour back-breaking work schedule, are extremely keen to participate in such work, especially in tree planting. Once the women are organised and mobilised, the evidence is that they work with great keenness and fight any obstacles that may be created by men, and we get as a result some of the highest tree survival rates found in afforestation efforts.<sup>52</sup> The biggest ally in the demand for an ecologically and socially sound nature is, therefore, womankind.

As exactly similar experiences have been noted in east and west Africa, in Kenya and in the Sahelian countries, there is every reason to believe that this differential interest in nature between men and women is cross-cultural in character. Male trees and female trees are now common jargon amongst those interested in involving communities in afforestation.

All this should not be taken to mean that poor rural households do not have any need for cash. The unfortunate thing is that much of the cash generated by the male does not get spent on household needs. A reasonable proportion of this cash gets spent on products like alcohol and tobacco and artefacts of modernisation like transistor radios.

The situation is creating a new demand on the time of poor women and in some cases, is resulting in a new militancy against nature. Women now have to go out and also earn some cash. Millions of rural women today sell firewood in the towns and cities. If we look at the quantum of firewood consumed in the cities, we can say that at least 2.3 million people must be engaged in headloading — bringing wood on their heads to sell in the towns — making the firewood trade the largest employer in the commercial energy sector of the country.<sup>53</sup> Surveys show that selling firewood is a profession that has grown rapidly in the last 10 to 15 years with the growth in landlessness and joblessness. Most of these headloaders are women, and mostly tribal women. Selling firewood is back-breaking work and brings in extremely little money. But the women do this because they cannot rely on their men to bring any cash back home. The big advantage with headloading is that this work is

generally available round the year. So when no other work is available, headloading at least provides some income.

Every headloading woman knows that the forests will be soon destroyed and even this horrible occupation will come to an end. But they are afraid that if they do not take advantage of the forest now, the foresters will soon sell it off to a contractor. The forest departments are extremely keen to get headloading banned. They have made no study of the phenomenon of headloading. They have not made any long-term plans to meet the firewood needs of the cities. They have obviously not made any effort to connect the two issues. Foresters have become environmentalists: they say that these women destroy young trees and lop trees excessively: therefore, ban them. No wonder forests are a major issue in most tribal agitations.

If a head count is taken at this stage, we will find that the destruction of the environment and its transformation is already affecting on an immediate and a daily basis at least the following groups: artisans, nomads, tribals, fisherfolk and women from almost all landless, marginal and small farm households. These groups add up to no less than half to three-quarters of the country's entire rural population. And unlike the situation in the West, the question of environmental destruction is not an issue related to quality of life but a matter of survival.

### **Towards holistic management**

If these are the problems, then what do we do about them? First of all, there must be much more holistic thinking regarding the management of our land and water resources. And this will not be easy unless a determined effort is made. For all the talk about the need for a scientific temper, it must be recognised that the current methodology of scientific analysis carries within itself an extremely unscientific practice: reductionism. It is this reductionist approach that has today produced both natural and social scientists who know more and more about less and less, who know how to cure a disease but create another disease in the process. Ecology is the first scientific discipline that has actually forced people to integrate and not reduce.

This can be illustrated by describing what is happening to the three major components of our lands: forest lands, croplands and grazing lands.

The destruction of forests has a major impact on the productivity of our croplands. This happens in two ways. Soil erosion increases manifold and the soil literally gets washed away, leading to an accentuated cycle of floods and droughts. But equally important is the impact of the shortage of firewood on the productivity of croplands. When firewood becomes scarce, people begin to burn cowdung and crop wastes. In many places, cowdung and crop wastes are now the major sources of cooking energy. Thus, slowly every part of the plant gets used and nothing goes back to the soil. Over a period of time, this nutrient drain affects crop productivity. Add to this the technology of the Green Revolution: the technology of growing high yielding varieties on a limited diet of chemical fertilisers like nitrogen, phosphates and potash. The total biomass production goes up and so does the drain of the nutrients from the soil. Plants need some 25-odd elements to grow, not just N, P and K.<sup>54</sup> They keep taking these nutrients from the soil and the more intensive the agriculture, without any manure and crop wastes going back to the soil, the faster is the nutrient drain. Today, the district of Ludhiana has the highest yields of many cereals but it also has the highest deficiencies of many micronutrients in its soil. In Punjab, many farmers have routinely begun to use zinc as a fertiliser. Soon it will be sulphur, manganese and iron deficiencies. The micronutrient fertiliser industry, already a Rs 10 crore industry, is set to become the boom industry of the future.<sup>55</sup> But the net result is that Indian agriculture, because of this and many other factors, most of them related to ecological factors, is showing a consistently declining trend in output when compared to the rapidly rising levels of inputs.<sup>56</sup>

If existing croplands and irrigation water resources are not used well, then faced with a rising population, the demand for colonisation of marginal lands for agriculture will grow. As large parts of the country have excellent soils and enormous sunlight and the only shortage is of water, government programmes have also promoted the cultivation of marginal lands, especially through the spread of irrigation. Fortunately, the rate of expansion of the cropped area has now come down as compared to the '50s and '60s but enormous ecological damage has already been done. Even more than forest lands, croplands have expanded on to grazing lands. The result is that graziers have been pushed on to lesser and lesser grazing lands. This has, in turn, led to the overstocking of grazing lands, the destruction of their productivity and the impoverishment of the graziers in the process.<sup>57</sup>

The graziers have taken recourse to two strategies in this situation. As the environment becomes more and more hostile, they get rid of the more vulnerable cattle and start keeping goats.<sup>58</sup> The number of goats in Rajasthan has expanded dramatically — much faster than any other livestock. Environmentalists may howl that the goat is highly destructive of the environment but it is a far better suited animal to the hostile environment that human beings are creating in Rajasthan, Gujarat and Maharashtra. It makes economic sense for the grazer to reduce risk during a period of drought, which is common in these areas.

The herders try to solve their problem in yet another way: they begin to use forests as grazing lands.<sup>59</sup> This infuriates foresters who see goats and cattle as the worst evil ever devised. It is true that India's forests are among the most heavily grazed in the world. But it is not true that forests disappear because of goats and sheep: they disappear only when they are chopped down and this is done usually under the aegis of the forest departments. Animals then move in to stop the regeneration of the logged forest. Animals cannot destroy a closed forest by overgrazing.

As forests are disappearing in Rajasthan and Gujarat, nomads in large numbers from these states now enter Madhya Pradesh, still a heavily forested state. The state's foresters, threatened by this invasion, banned these 'foreign' invaders by law but the Supreme Court struck down the ban saying that Indians cannot be restricted from going from one state to another.<sup>60</sup> So the inter-state movement goes on but clashes are accelerating. Madhya Pradesh's foresters killed 5,000 sheep in one extremely brutal incident on the Madhya Pradesh-Rajasthan border last year and local politicians rushed to rouse passions against the nomads, making every effort to break down the highly synergistic relationship that once prevailed between nomads and settled farmers. The nomadic animals would earlier bring manure to the fields of settled farmers. Like a walking vacuum cleaner, these animals would gather nutrients from all over and dump them on to the farmers' fields where they would rest and the nomad would even be paid for this service. But today there is open hostility.

The Madhya Pradesh forest secretary recently wrote an article in the *Times of India* saying: "For the love of Mike, please keep these animals out of our forests." If only the animals could be kept out, the forests would regenerate themselves. But such despair is no answer. Animals cannot obviously be kept out without creating extraordinary conflict.

Meanwhile, however, the foresters have found an ingenious solution: plant trees like the eucalyptus which cannot be browsed by animals. Eucalyptus is loved by foresters exactly for this reason. There are many who doubt the ability of eucalyptus to produce more biomass than many indigenous species. But it is indeed ironic that when the country faces an acute fodder crisis, the forester can only plant eucalyptus and produce non-browsable biomass, doing exactly the opposite of what the people need. In fact, eucalyptus is the true weed from the point of view of the landless. It is non-browsable like all fast-spreading weeds and does not benefit the poor unless they own land.



But in this manner the cycle of destruction is complete. The forest departments have destroyed forests by selling off timber to the industrial and urban interests. The firewood shortage and the resulting soil erosion is keeping the productivity of Indian agricultural lands low. Croplands have expanded on to marginal lands and have reduced grazing lands. Animals have moved into forests and are preventing regeneration. Meanwhile, as landlessness and joblessness grow, even groups like the tribals who from times immemorial have lived in total harmony with forests, are turning against forests and want to sell them off as fast as they can. All the chickens are coming home to roost.

Experts sit in grand isolation. Foresters have no interest in fuelwood or in croplands. Agricultural experts have no interest in animals or in grazing lands. Animal husbandry people never tell foresters that they must produce fodder banks.

In the life of the proverbial last man — or as I would prefer, the last person of Gandhi — all this isolated thinking brings havoc. Life for the poor becomes terrible. Finally, even nature turns against itself. Once denuded, the high solar energy and temperature — the very factors that can bring high productivity and prosperity — begin to bring high desiccation, erosion, destruction and social and ecological poverty. FAO figures show that the effect of unchecked soil erosion on soil productivity is one of the highest in the world, given the climatic conditions of south and Southeast Asia.

### **Population and resource constraints**

India's increasing population has often been blamed for nullifying the gains made by post-independence economic development programmes and for increasing environmental destruction. Any serious discussion of the economic and environmental ill-effects of population growth must firstly take into account the consumption patterns that exist within society and, secondly, must be based on some understanding of the carrying capacity of India's lands. No authoritative study exists that relates all these factors to provide a composite picture.

On a global basis, at least, it is clear that there are two population groups that are putting enormous pressure on the environment. The first and most widely talked about group is of course the world's poor. It is a large fraction of the world's population. It subsists — or more accurately is being forced to subsist — on a small fraction of the world's resources. While its population is growing, its share of world resources is probably diminishing. This is leading to an *extraordinarily intensive* use of resources: heavy logging of trees, overgrazing, cultivation of marginal lands, reduced fallow period, etc. The environment-population literature is full of concern about how the poor are destroying the environment. This is, however, the old game of blaming the victim.

The second human group destroying the environment is of course the rich but its depredations are much less talked about. An excellent example of this hypocrisy is the much touted world conservation strategy prepared by the International Union for Conservation of Nature, on the basis of which the Government of India is preparing a national conservation strategy.<sup>61</sup> The strategy talks about the urgent need for sustainable rural development but makes no mention of the far more crucial need for sustainable urban development or of Western development.

The rich are small in proportion but they consume a very large fraction of the world's resources and seem to be steadily increasing their share. This group is no longer living on the resources of its ecosystem and depends on an *extraordinarily extensive* use of the world's natural resources. Japanese companies, for example, happily destroy one forest in Indonesia and move on to another forest in Papua New Guinea. The rich destroy the environment not only by their own consumption but also by forcing the poor into a situation where they survive only by overexploiting their environment.

Europe was the first continent to have outstripped the capacity of its ecological space to cope, both because of its growing population and its growing consumption levels. Europeans solved the problems posed by their unprecedented breeding over the last few centuries mainly by colonisation of vast tracts of land. Between 1846 and 1930, over 50 million Europeans were exported to set up homes in North America, Latin America, Australia and South Africa. The Caucasian population of the world grew from 22 per cent of the human species in 1800 to about 35 per cent in 1930.<sup>62</sup> And today the situation is that even the vast colonised lands are not sufficient to meet its gigantic appetite. The Third World's population crisis today arises not because its current growth is unprecedented, but because it can neither solve its problem by spilling over into other ecosystems nor does it have the financial clout to purchase resources from other ecosystems. The Third World can survive only by finding a process of development that would allow it to accommodate its people by developing resources available within its own ecosystems. This is something that the Western development model does not know and cannot teach.

Knowledge of the carrying capacity of India's lands is extremely limited. There is no worthwhile study covering even the area of a development block, let alone a state or the whole nation, which also reveals the puerile level of the population concern in India. Fortunately, the detailed exercise carried out by FAO of the population supporting capacity of tropical lands shows that India, unlike many other countries, is in a position to feed at least two billion more people with known technology.<sup>63</sup> In other words, properly managed, India's lands can bloom bringing unprecedented prosperity, and population control is not a crucial issue.

But this does not mean that the population must expand to fill the ecological productivity possible, or that family planning programmes are not important. The demand for family planning should arise not out of the state's self-professed inability to cope with the growing population's needs. This should be taken more as a reflection of the population having outgrown the population-supporting capacity of a system of governance rather than of the natural environment, at least in the case of India. The demand for family planning in a society ought to arise out of a respect for the woman's body, as part of a process that aims to increase women's self-assertion and assuredness and gives women the right to decide how their bodies will be used. Female literacy is closely related to falls in the birth rate and Kerala is a fine example of this within India itself. Probably the most important difference between Kerala and Punjab, the most prosperous state, is that while Kerala's GNP has grown much more slowly than that of Punjab, a much larger proportion of the increase in Kerala has benefited women than in Punjab. The Kerala example shows that when women get a fair share of the wealth and services created in society, there is the likelihood of a much more healthy social and demographic development.

In other words, family planning is not a state right but a human right, especially a women's right, and the path to it should be through a healthy process of social development, with a focus on women's needs and problems and not through a technical-marketing programme for development and distribution of newer, and usually dangerous, contraceptives.

### **Improving the gross nature product**

Nothing could be more important for planners and politicians today than to rebuild nature. But this can only be done if we re-establish a healthy relationship between the people and their environment. Then only a nature that is useful to the millions, not for making millions, can be re-established. Regardless of what happens in the West in the next two decades, for all its electronics revolution, its efforts to mine the oceans and its efforts to build solar cells and windmills, and how dramatically this changes the face of the world technostucture, and regardless of how much we may want to catch up with the West in the name of modernisation or out of the sheer compulsions of geopolitics, rebuilding nature and rebuilding its relationship with the people will remain the only way to solve the problem of poverty and possibly even unemployment. With some 100 million to 150 million ha of waste

and near-wastelands and with a crying need to produce biomass, this country can never get a better opportunity to harness the power of its people to the productivity of its land, to strike at the roots of landlessness, poverty and unemployment, all at the same time.

If enough biomass was available, poverty, that is, lack of cash, as defined by economists and by the modern civilisation, will not disappear. But the rigours of poverty, the increasing susceptibility to natural emergencies like floods and droughts will be arrested by creating more biomass. In fact, conventional measurements of poverty based on income data or on food calories are clearly inadequate in a situation where the rest of the biomass needs are becoming increasingly difficult to meet and collecting them on a daily basis constitutes the worst — and growing — drudgery humankind, especially womankind, has ever known. These calculations are not only just inadequate but they also reflect a strong gender bias because they deal mainly with those aspects of poverty — lack of cash — that the male is generally concerned with, but not with those aspects of poverty that the woman deals with — lack of fuel, fodder, water etc.

If we were to construct a concept like gross nature product, we would find that for the poor it is this indicator, which is many times more important than the conventional gross national product (GNP). In fact, we can even say that those who do not get much from the conventional GNP — the poor — are the ones who are most critically dependent on the gross nature product. The GNP cannot be allowed to destroy or transform the gross nature product.

Just as economists get very worried about the structure of the GNP, it is equally important, if they have the poor in mind, that they get worried about the structure of the gross nature product. It is not just the quantity of biomass that is important for meeting basic household needs but also its diversity; sources of biomass within any village ecosystem must be diverse enough to meet the various household needs of fuel, fodder, building materials and herbs, and of raw materials for artisans.

The diversity in nature has also acted as insurance during periods of emergency by reducing societal vulnerability. During periods of drought and resulting crop failures, which are recurring phenomena in many parts of India, fruits from trees and roots, leaves and wild animals in the forests used to become an important, alternative source of nutrition. In 1983, the tribals of Chotanagpur survived a drought not because of government assistance but despite government callousness. It is the forests which gave them their nutrition. Surviving on the forest during a drought is common in Bastar. Wild animals caught in the jungles become a significant source of food during periods of crop failure. A study from Africa found that in times of drought, traditional societies had nearly 150 responses. They even fed the thatch of their huts to the goats. But in a modern village there were only two responses: pray to God (which even the Tamil Nadu government recommended during the Madras water crisis) or migrate to the towns. The combination of trees, grasses, crops, animals and ponds, which we found in almost every village was an extraordinarily interactive and resilient system for emergencies. Instead of destroying this complex and interrelated system, science must be used to build on it.

In other words, it is not enough to preserve biological diversity in just those areas of our country where the flora and fauna are genetically rich and diverse by setting up biosphere reserves and national parks, but that biological diversity must be preserved and/or recreated in every village ecosystem. Concentrating on the production of a few commodities (cereals, for instance) is totally inadequate in a society which is only partly monetarised and where the vast majority still has to depend on access to free biomass resources from the immediate environment. Every village has to become a biosphere reserve. If sufficient biomass could be generated, there would also be none of those tensions we see around nature protection areas today.<sup>65</sup> At a time when biomass is in acute shortage, it is obviously

foolhardy to attempt such protection without massive schemes for largescale biomass generation.

Understanding of the gross nature product and how it is changing within the national ecological space (or shall we say, national economy) is extremely limited, despite its crucial importance for the poor. We know nothing, for instance, about the importance of so-called weeds for the poor. The reason we know so little about the gross nature product is because the 'growing stock' of biomass does not get reflected in GNP calculations anywhere. Therefore, whether the 'growing stock' lives or dies, exists or disappears, does not make any difference to economists. Most economists, not surprisingly, have no clue of what happens to a subsistence economy when its biomass resources are affected. The increasing hardships and tensions only get reflected in studies of 'political economy which record growing conflicts over land, forests, fodder, grazing lands, water sources, etc, or in totally unexpected indicators like the sex ratio of the country. Just why 22 million women failed to show up in India's 1981 census is anybody's guess. Surely their extraordinary work burden, in a situation of malnutrition, must be an important factor.

It is for this reason that an indicator like gross nature product, and changes in that indicator, would probably reflect far better the changing reality in the subsistence sector of a country like India. Unfortunately, we do not know as yet how to construct such an indicator. But if we did, we will definitely find that while the conventional GNP has gone up, the gross nature product has steadily gone down, the former acting as a parasite on the latter.

The answer to India's immediate problem of poverty lies in increasing the biomass available in nature in a manner that access to it is ensured on an equitable basis. But giving a relevant 'green cover' to the country — the real Green Revolution — would probably require the most holistic thinking that planners economists and scientists have ever known. The conflicts and complementarities in the existing land use patterns have to be extremely well understood. Otherwise, landuse patterns will remain as chaotic as today. Landless and poorer peasants will continue to oppose planting trees on community lands under so-called social forestry programmes because they are afraid this will take away their grazing lands, while forest departments and richer peasants will only plant those trees which animals cannot touch (like eucalyptus) even though there is a stark fodder crisis all around. Nothing could take us closer to Gandhiji's concept of *gram swarajya* than striving to create village ecosystems which are biologically diverse and self-reliant in their local biomass needs to the maximum extent possible. This will clearly demand an extremely intensive use of our natural resources like land and water to create huge and diverse growing stock of biomass. Any science which teaches how to do this will truly have the right to be called a people's science — and indeed it will have to begin with the traditional knowledge of the people. Even more so, planning for the enhancement of village ecosystems will call for village-level planning with the involvement of the people — a level of decentralisation that has never been attempted either in resource planning or in resource management.

The biggest challenge, therefore, is before social workers and politicians who have to play a crucial role in ensuring that people can participate in this biomass-based development process. No biomass-based strategy can succeed without the involvement of the people, especially women. If useful nature is to grow, it will have to be protected and nurtured. The walls built to protect nature will be respected by the people only if they are people's walls and if the people know that what grows beyond, belongs to them.

Easy availability of biomass leading to a reduction in women's work burden could create the appropriate conditions for many desirable social changes. Kerala, for instance, is often cited as an interesting case of an economically poor state moving ahead with its demographic transition. But is Kerala poor in environmental terms also? The availability of biomass, in fact, appears to be the maximum in India and women's work burden low. This may sound an exaggerated proposition but would it be right to surmise that, among many other things, it

was also the easy availability of biomass and relatively lower work burden that created the appropriate conditions for literacy programmes for women to succeed? If women in Kerala had to spend as much time working as women do in large parts of Rajasthan, Uttar Pradesh and Bihar, wouldn't there have been immense male pressure to keep women working in crucial household activities and away from schools?

Immediately, at least, the country must realise that a clear biomass policy is desperately needed, which recognises the competing uses for biomass in society, especially between biomass-based industry and poor households and sets clear priorities on the use of biomass in a situation of scarcity. The needs of the poor must be specified as a priority use of biomass in the existing situation of environmental degradation. A beginning definitely needs to be made with the proposed Forest Policy and with rural energy planning in general.<sup>66</sup>

If India fails to recreate nature on a massive scale in a manner that generates employment and equity, not only its villages but also its cities will become unlivable. Many people prefer to call the urban migrants economic refugees from the countryside. But to my mind many of them are really ecological refugees, displaced by dams, by mines, by deforestation, by destruction of grazing lands, by floods, by droughts, by urban expansion, and what not. We have today the world's fourth largest urban population. Before the end of the century we will be the largest. Managing this huge urban population will call for extraordinary political and managerial sagacity and altogether new approaches, something we cannot learn from the rest of the world. But one thing is definite — if the process of urbanisation continues to create the same demands on our rural environment, it will only accelerate the destruction of that environment and in turn make the urban environment impossible to manage. India cannot survive without a low-energy, low-resource input urbanisation. In its absence, no law or laws, like the so-called Delhi Bills,<sup>67</sup> which try to turn the incoming ecological and economic refugees into our cities into criminals, will work. Only a holistic approach to our problems and dedicated political will to solve them will.

### References & Footnotes

1. *The State of the Environment — 1972-1982*, United Nations Environment Programme, Nairobi, 1982, p 5-7
2. For an example of how the argument is turned on its head, see what Barbara Ward has to say: "We must be clear where the immediate responsibility for inaction lies. The peoples of North America, Japan, UK and the rest of Western Europe make up, together with a few oil states, the great majority of the world's rich citizens. Ours is the responsibility for the present appallingly skewed distribution of resources. The richest 20 per cent, largely living in the West, have three-quarters of the wealth, The remaining three and a half billion of our fellow citizens must make do with the quarter that remains. And it is for the world's poor — the nations of the Third World and the poor majority within those countries — that a decent environment is even more important than it is for the rich West. The poor are always near the margin and the margins of our global environment are today smaller than they were 10 years ago in Stockholm." Quoted in Vohra, B B, *Environment within the United Nations — Developing Country Viewpoint*, ed Shiela Bajaj, Environmental Services Group — World Wildlife Fund, New Delhi, 1982
3. Mann, H S and Prakash, Ishwar, *Halting the March, Ecodevelopment in the Thar*, Department of Environment, Environmental Services Group — World Wildlife Fund, New Delhi, 1983, p3
4. Gadgil, Madhav, and Malhotra, K C, Report of the field study conducted on behalf of the Committee on Legislative Measures and Administrative Machinery for Environmental Protection, Department of Science and Technology, New Delhi, 1980, p3
5. *The State of the Environment*, op cit, p59
6. *World Conservation Strategy*, UNCN UNEP WWF, 1980, section 19
7. Gadgil, Madhav, *Towards an Indian Conservation Strategy*, Policy Paper, Indian Social Institute, New Delhi, 1982

8. Bhattacharya, Kapil, *Bangladesher Nod, Nodi O Porikolpona*, Bidyesoy Library Pvt Ltd, Calcutta
9. Paranjpaye, Vijay, *The Woes of Gangawali: An Economic Analysis of the Bedthi, Stage I, Hydroelectric Project in Uttar Kannara*, Gokhale Institute of Politics and Economics, Pune, 1981
10. Srinivasan, Kanna, Rajgopalan, S and Vyasulu, Vinod, *The Orissa Aluminium Project: Points for Debate*, Seminar Paper, Indian Social Institute, Bangalore, 1981
11. *Environmental Impact of Mining in Madhya Pradesh*, Environmental Services Group, New Delhi, 1983
12. Joshi, Gopa, *Forest Policy and Tribal Development: Problems of Implementation, Ecology and Exploitation*, Seminar Paper, Indian Social Institute, New Delhi, 1982
13. *Evolution of Legislation of Forestry in India: A Note in the Light of the Forest Bill*, Seminar Paper, Indian Social Institute, New Delhi, 1982
14. *Water Pollution: A Threat to the Desert*, Environment Cell, Gandhi Peace Foundation, Jodhpur
15. Mohan, Dinesh, *'Accidental' Death and Disability in India: A Case of Criminal Neglect*, First Annual State Bank Lecture, Centre of Biomedical Engineering, Indian Institute of Technology, New Delhi, 1982
16. Bose, Tapan K, *Ecopolitics and the Adivasis*, Cinemart Foundation, New Delhi, 1983
17. *Report of the Workshop on a New Forestry Policy*, Indian Social Institute, New Delhi, 1982
18. *Tata's Proposed New 500 MW Thermal Power Unit at Bombay*, Bombay Environmental Action Group, Bombay
19. Subramaniam, P V R and Mohanrao, G J, *Pulp and Paper Mill Waste Treatment*, Symposium on Environmental Pollution, CPHERI, Nagpur, January 1973, p133
20. *The State of the Environment*, op cit p23
21. Prasad, Narendra S, and Gadgil, Madhav, *Conservation of Bamboo Resources of Karnataka: A Preliminary Report*, Karnataka State Council for Science and Technology, Bangalore, 1977, p9
22. Bose, Asit, *Legal Control of Water Pollution in India*, Indian Institute of Management, Calcutta
23. For several examples of people's initiatives, see *State of India's Environment: A Citizens' Report*, Centre for Science and Environment, New Delhi, 1982.
24. This manner of response is true for other issues also; for example, the spate of dowry deaths and rape cases and increasing protests by women's organisations has resulted in more centralised legislation, against which women's organisations are again protesting
25. For instance, the Bombay Municipal Corporation resorted to series of forcible evictions of slum dwellers from municipal land to save "the health of the citizens of Bombay" until it was pointed by voluntary organisations that 60 per cent of the "citizens" of Bombay lived in slums