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ENVIRONMENT : A MATTER OF SURVIVAL

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In the middle of 1995, two very different events signalled the arrival of the environment debate squarely into the centre of Indian society and polity. The first was the announcement, by the Tehri Garhwal district authorities, prohibiting the entry of Medha Patkar and other members of the Narmada Bachao Andolan into the district. Their stated reason was that they feared violence between the supporters of the controversial Tehri Dam, and those who opposed it; environmentalist Sunderlal Bahuguna was then in the middle of a fast seeking stoppage of the construction on the dam. In reality, of course, the government was simply scared that the agitation against the dam would greatly intensify if the Narmada Bachao Andolan was allowed there.

The second event, rather on a different note, was the publication of articles on environment on the front page of several issues of *Employment News*, the official organ for such news brought out by the Government of India. The fact that a magazine devoted to employment thought the subject important enough, was indication enough that the old divide between economy and environment had been officially demolished.

The intricate and inextricable link between economy and environment is a recent realisation for formal economists, but has always been recognised and practised by rural populations. After all, humans survive not by money and markets and televisions, but by fresh air, fresh water, productive food-growing land, and biological resources. Take these away, and humanity would perish within minutes, regardless of how robust the stock markets are. The most powerful of economies is ultimately based on these elements, and even the most sophisticated of technologies cannot recreate them, if destroyed.

This paper addresses four basic issues :

1. The kind and extent of major environmental problems;
2. The impacts of these problems, especially on vulnerable human populations and other species;
3. The causes of these problems, both fundamental and proximate;
4. The solutions, including those already being implemented and those proposed or needed.

The basic propositions put forward here, corresponding to the above four issues, are:

1. In India, the environmental crisis is already here, causing enormous disruption

of lives and livelihoods, and threatening the collapse of its entire life-support system.

2. Environmental problems affect different parts of our population differently, the main brunt being borne by poor and disprivileged classes of humans, and by non-human species.
3. These problems have only their proximate causes in factors like population growth, poverty, consumerism, resource mismanagement, and technological inappropriateness. More fundamentally, the environmental crisis is rooted deep in the social, economic, and political structure, more specifically in the relations of inequality between different classes and generations of humans, and between humans and other species.
4. Solutions to these problems therefore cannot be technological, managerial, or demographic, but also, and more crucially, socio-political and ethical. While governmental structures are addressing the issue mainly at the former, superficial level, people's movement and sensitive intellectuals are raising the more fundamental issues and coming up with viable alternatives.

Dimensions of the Environmental crisis in India

As agriculturists, fisherfolk, forest dwellers, and pastoralists, the majority of Indians are still *directly* dependent on nature---soil, biodiversity, waterbodies---for their survival and livelihood. For these people, the natural environment is not merely a thing of beauty and joy, but the very basis of day to day survival. Farmers, constituting 70% of our workforce, would be helpless without productive land, in turn dependent on forests for soil conservation and nutrients. Fisherfolk, another several million, would be rendered jobless and hungry without productive fisheries, which can only survive in healthy rivers and seas. Forest-dwelling tribals would be deprived of not only their livelihood source (bamboo, *tendu patta*, cane, etc.) but also of a substantial input of nutrition from wild fruits, tubers, and animals, in turn dependent on intact forest ecosystems. And so on, for the millions of craftspersons, nomads, and other 'ecosystem people' who eke out a living from, and whose cultures and psyches are intimately associated with, the natural world.

In the last few decades a massive attack has taken place on this natural resource base, with severe impacts on the majority of the Indian population.

There are many dimensions to this crisis, some more frightening than others. Take *land*, perhaps our most threatened resource. The Union Ministry of Agriculture admitted in 1980 that of a total landmass of 328 million hectares in India, as many as 175 million hectares, or 53% of the total area, are suffering from various levels of degradation. A major portion of this, about 150 million hectares, is seriously eroded by water and wind. The soil lost thus would be worth several hundreds of crores of rupees, and one estimate puts the nutrient loss at greater than the total fertilizer production in India. Even surface irrigation, designed to give a boost to land productivity, has actually degraded land over vast areas—waterlogging and salinisation threatens the loss of over 10 million hectares of agricultural land. Indeed almost 60% of our total cultivated area of 140 million hectares is facing degradation.

One major cause for land degradation is deforestation, which is a serious problem in itself. The dimensions of *forest* destruction in India in the last few decades are staggering. Precise estimates of forest cover are not available for the period prior to the 1970s, but rough calculations suggest that at the time of Independence, possibly about 30% of India was covered by forests. Latest satellite imagery and interpretation by the Forest Survey of India indicate that by the early 1990s, the cover was down to about 19%. This too is an exaggeration of sorts, for dense forests (above 40% canopy cover) were measured at less than 12% of the Indian landmass.

Water, too, is equally threatened. Deforestation and land mismanagement have caused severe hydrological imbalances resulting in acute water shortages all over India. This is added to by rampant over exploitation of ground-water reserves in many areas, to check which there are still no regulations. To top it all, pollution from towns and cities, industries, and Green Revolution fields (pesticides and fertilizers) has rendered much of the remaining water unfit for direct use. Over 70% of surface water in India is seriously polluted today. *The Economic Survey of 1995* admitted that 90% of the water in India's 241 Class II towns was polluted. Over two decades of pollution control and sewage treatment have not substantially improved the situation, as rapid urbanisation continues to outpace official pollution control efforts. Recent surveys suggest that over 50% of industries may still be disgorging effluents above the prescribed standards. Deadly industrial wastes like arsenic, mercury, nitrates and fluoride flow unchecked into rivers and lakes, and increasing pesticide and fertilizer inflows from fields are contaminating water sources.

To add to water pollution are various other kinds of pollutants. The *air* in most of our cities is filthy — average levels of suspended particulate matter in the 4 metropolitan cities is over 360 micrograms per cubic metre, while the World Health Organisation has stipulated a safety level of 150 mg/m. Oxides of sulphur and nitrogen, hydrocarbons, lead, carbon monoxide, and other hazardous gases are emitted in tonnes from industrial chimneys and auto-vehicular exhaust. Noise too is becoming a serious menace, the average level in many cities having crossed 70 decibels, and certain congested areas recording over 90 decibels for the better part of the day. Millions of workers are being exposed to highly unhealthy occupational environments, full of dust, heat, noise, dirt, gases and dangerous machinery.

To add to the hazards are the mushrooming chemical industries and nuclear power plants, both of which have shown a terrible safety record in India. The Bhopal disaster was only the most visible sign of the dangers posed; smallar 'accidents' like Bhopal are happening all over India all the time, killing or maiming workers and the surrounding population in smaller numbers. Though no major accident has so far taken place in the growing number of nuclear facilities in India, the possibility is certainly not remote. Despite a veil of secrecy around the nuclear programme, it is well-known that most India's nuclear power plants have been plagued by minor reactor accidents — the Rajasthan Atomic Power Plant has perhaps the most radioactively contaminated interior in the world. The number of time-bombs amidst us is steadily, rapidly increasing, not only in the form of large hazardous industries but also tiny, unnoticeable pollutants like *pesticides* which continue to accumulate

in our bodies until they reach a level high enough to cause cancer. Indians today have amongst the highest pesticide residues in their body fat in the world, and foodstuffs in several major cities have regularly shown residues much higher than the prescribed tolerance levels.

THE IMPACTS

Impacts on Humans : The Poor Are Worst Hit

The localised and national effects of environmental damage in India are becoming increasingly clear. Loss of topsoil, waterlogging and salinisation, and shortages of water and biomass have caused serious decline in agricultural productivity in many areas, a decline which can only be temporarily offset by pumping in artificial stimulants like chemical fertilizers. The prospect for food security are bleak when we are facing the loss of over half our crop-producing land.

While environmental degradation ultimately affects everyone, the immediate and most severe impacts are felt by the poor.

Land degradation directly hits farmers, lowering agricultural productivity. Big farmers can afford to compensate this loss by putting in artificial stimulants like fertilizers, but for marginal farmers it is a rapidly losing battle. Deforestation directly affects those for whom the forests are the main means of survival---tribals are displaced and rendered unemployed as the bamboo forests that they used to make house and baskets and various articles for sale, are sucked away by a nearly paper mill; villagers become increasingly marginalised and impoverished as their sources of firewood, fodder, and minor forest produce get destroyed and they have to buy these things at ever-increasing prices. Indirectly, too, deforestation hits the poor; the widespread and debilitating droughts which have struck India in the last few years are in many cases greatly intensified by forest destruction, and have obvious negative repercussions on the rural poor; even where severe drought does not occur, streams and other water sources get drier and drier, making the once-simple act of obtaining water more and more difficult; and as an ironical contrast to this, millions of people are rendered homeless and jobless by the increasing fury of deforestation-induced floods. Poverty in these cases is a direct outcome of environmental destruction.

Pollution, too, affects the poor more. Perhaps over 70% of the diseases in India (In terms of number of people affected) are caused by polluted water. These diseases hit the poor more than the rich for three reasons :

1. They are often forced to live in more polluted surroundings (like urban slums).
2. They are, due to their low nutritional status and general ill-health, more susceptible to pollution-caused diseases.
3. They are also the ones who have least access to or can least afford medical treatment.

This triple-edged sword affects the vast majority of India's population. Apart from the human suffering, there is enormous economic loss too — one estimate puts the number of workdays lost due to diseases caused by water pollution at 73 million

annually. This is added to by an increasing number of illnesses caused by air and noise pollution, and injuries resulting from exposure to hazardous chemicals and processes. Again, it is the poor who are worst hit — annually, hundreds of thousands of industrial workers, especially contractual labourers, fall prey to environmentally degraded working conditions; agricultural labourers, the poorest rural strata, are most exposed to the dangers of threshers and pesticides.

It is also becoming increasingly apparent that women are generally more affected than men. In most cases they are the ones who do chores like collecting firewood, fodder, and water, and as these get harder and harder to get due to deforestation, the drudgery of their life increases. Women in several parts of India now walk over 10 km. daily just to obtain these necessities, often traversing treacherous mountainous terrain. All over India women of poor households cook in ill-ventillated kitchens, inhaling upto 40 times the volume of suspended particles considered safe by the World Health Organisation, or an amount of cancer-causing benzopyrene equivalent to smoking 20 packs of cigarettes in just a few hours. Being of lower nutritional status than men, e.g., with a very high prevalence of anemia, women are also more susceptible to such pollution. Also in this extra-susceptible category are, of course, small children and old people.

Impacts On Other Species

Some 130,000 wild plants and animals have been recorded within the country, with possibly twice or thrice more remaining to be discovered, and with micro-organic life being as yet virtually unknown. However, a combination of habitat destruction, over-exploitation, poisoning, and the introduction of exotics has endangered a large part of this biological diversity. Unfortunately, status surveys of all but a handful of species are still not available. Conservative estimates suggest that at least 10% of India's recorded wild flora, and 20% of its mammals, are on the threatened list. Many of these would now be categorised as "critical", i.e., on the verge of extinction.

In fact, no-one can say for sure how many species we have already lost. Amongst mammals, the Cheetah/*Acinonyx jubatus*, and amongst birds, the Pinkheaded duck — *Rhodonessa caryophyllacea*, the Mountain quail/*Ophrysia superciliosa*, and the Forest spotted owlet/*Athene blewitti*, are extinct Indian species about which much has been written. Not so well-known are plants like *Hubbardia heptaneuron*, which disappeared when a hydro-electricity dam was built upstream of its riverine habitat. Indeed, there are likely to be hundreds, perhaps thousands of other species which have gone forever, unsung and unrecorded either because they were not "glamorous" enough, or because we simply did not know that they existed. This is, of course, a major ethical tragedy; but it is also a major loss to the majority of India's population which depends on biodiversity for food, drink, medicine, objects for ritual use, and other needs.

These needs have also been badly hit by the erosion in India's domesticated biodiversity. This region is recognised as one of the world's major centres of crop and livestock origin and diversity. To take just one example, there were till not so long back, at least 50,000 to 60, 000 varieties of rice being grown by Indian farmers. The

Green Revolution, with its emphasis on high-yielding varieties, has homogenised agriculture so much that much of this genetic diversity no longer exists in the farmers' fields. Several indigenous livestock breeds are also seriously endangered, due to State-sponsored programmes of hybridisation with exotics. Unfortunately, no overall estimate is available of the level of genetic erosion which has taken place in crops and livestock, but the loss is considerable. And since modern agriculture depends on this genetic diversity for new characteristics, the Green Revolution process is a bit like building the roof of a house by taking material from the foundation.

The causes of the Environmental Crisis

To a casual observer, the causes of environmental problems in India are obvious enough: too much population, poverty, consumerism by a small elite, outmoded technology, corruption. These are, however, only the proximate or surface causes. The view that such demographic, technological or managerial factors are the roots of the environmental crisis just does not hold water if one looks closely enough. Population growth, the needs of the poor, mismanagement and inappropriate technologies all add to the pressures on our environment, but they are not the origin of the crisis—indeed, they are all themselves a result of another factor which lies at the bottom of environmental problems, which is the socio-political structures of our society.

An average American consumes 40 times more resources than an average Somali. A similar ratio is probably seen in the Indian context, if one compares the resource consumption of upper class urban dweller with that of an average villager. The American population with its profligate consumerism is far more destructive of the earth's environment, than a much larger Asian population; similarly, the richest 5% of Indian society probably causes much more ecological damage than the poorest 25%. Clearly, it is not mere numbers which are critical, but rather *who* consumes *what* and *how much*. This in turn is dependent on relations of power, on *who* decides what is to be done with an area's natural resources. In this context, the most important aspect is the relations of inequality between people on the one hand, and between humans and other species on the other.

Fundamentally, it is these relations of inequality which catalyse environmental destruction. Three main forms of inequity can be distinguished in this context:

1. *Intra-generational inequality* : Hierarchical relations between classes, castes, races, communities, countries and the sexes, within one generation, can create conditions for environmental destruction. Those in power are able to dictate the use of natural resources to suit their own needs, regardless of its consequences on others.
2. *Inter-generational inequality* : Entire generations of human beings as yet unborn, who will be depending on the same natural resources we are currently using, have no voice in decisions taken regarding these resources. Humanity is clearly over-exploiting the earth's natural gifts – water, topsoil, minerals, forests, fossil fuels — eating into their 'stocks' at a rate which is likely to leave little for future generations. What we *are* likely to leave for them in massive quantities, on the other hand, are toxic wastes, barren wastelands, polluted waterways, and a handful of pest species which have thrived on human wastes.

3. *Inter-species inequality* : Humanity shares the earth with a mind-boggling diversity of life-forms, perhaps upto 30 million plants, animals and microbial species. This extraordinary explosion of biological diversity is not merely a source of wonder, but as fundamental a bedrock of human existence as air, water, and land. Yet, simply because we have the might, we have considered it our right to colonise most of the earth's land surface and increasingly even its aquatic habitats. Never before in evolutionary history has one species achieved such destructive dominance: over one-fourth of all plant and animal species are condemned to extinction within the next few decades due to the human hand. The inequality between humans and other species is the most pervasive of all inequalities, and its consequences the most tragic.

A clear understanding of the origin of the environmental crisis in these relations of inequality can be gained by taking some examples from India. Deforestation in the subcontinent has been generally attributed to the rapid rise in population during this century. However, its roots lie elsewhere, as is evident from several keenly documented historical accounts which have recently emerged. The 'nationalisation' and take-over of India's forests by the British colonial government in the last century was primarily meant to establish control over a valuable resource. It was then that large-scale forestry operations started. Unfortunately, this centralised control was continued after Independence, and a systematic process of exploiting forests for commercial uses was intensified. This also forced local communities into over-using the remaining 'Village Forests' which were in their control. This over-use for growing local populations was intensified because, with their basic livelihood resources being taken over by the State, they often had to cut and sell wood for making a livelihood. And so was built up a situation in which both rich and poor, both the powerful and the powerless, indulged in environmental destruction. This situation remains prevalent even today.

To take an even more specific example, bamboo forests in many parts of India have been nearly wiped out by paper mills. It is an indication of the anti-poor character of Government policies that these mills were till recently given bamboo at prices far below the market price while tribals, who once obtained free bamboo for their livelihood from the forests now destroyed by the mills, had now to buy it in the market. For instance, till not so long ago, paper mills in Karnataka were paying Rs. 15 per tonne of bamboo while the poor could purchase it only at Rs. 1200 per tonne! As pressure from industries and urban consumers continues to grow, the poor have to depend on lesser and lesser forest area for their essential needs of fuel and fodder and shelter, forcing them to destroy their own resource base.

Million of hectares of land go under mining or urban growth or other such 'development' projects because those who benefit from these projects — mostly urban consumers, industrialists, contractors, politicians, and the like — have greater control over land than do farmers and pastoralists depending on that land. The worst cases of pollution are found inside factories, because workers have little power in industrial decision-making, and little scope for moving to another job. Big industrialists, on the other hand, continue to cause pollution because they have influence over local politics or money to pay the nominal penalties imposed on them. Agricultural labourers who

conduct hazardous operations like pesticide spraying are mostly from the lowest economic class as well as lowest social rank (caste). Slumdwellers live in sub-human conditions because they do not form an influential lobby in urban planning and cannot afford to buy adequate land. Domestic air pollution by smoky wood/coal stoves has till recently been completely ignored by energy policy makers because women have little say in a male-dominated society.

Development and Environment

India's entire development process has been distorted by the structure of inequality outlined above. Adapted almost wholesale from the West and characterised by unrestricted, large-scale industrialisation, urbanisation, consumerism and materialism, today's path towards 'progress' is quite evidently causing severe environmental destruction and resource depletion. It is a process which greatly benefits a small section of Indian society, has some "trickle-down" effects on a somewhat larger section, but almost completely leaves out another large section who become more and more impoverished. Millions of people are today worse off than they were when our modern 'development' process was started—tribals have been alienated from their land and forests, nomadic communities have had their pasture lands taken away by mega-projects, marginal peasants and the landless have become economically even more insecure. Between 20 and 30 million people have been displaced by development projects, rendered refugees in a desperate search for shelter and jobs, because they had not say in the development planning of the country. For these people, "development or destruction" is not a mere cliche, it is a burning question.

The process of liberalisation and 'structural adjustment' which India embarked upon in the 1990s, has only served to further intensify the environmental and social crisis outlined above. There are at least four aspects to this :

1. The drive towards an export-led model of growth is rapidly sacrificing natural resources to earn foreign exchange, as especially seen in the fisheries and mining sectors.
2. The move towards liberalisation is resulting in an atmosphere of a free-for-all, with industries increasingly ignoring environmental standards, and state governments sacrificing natural habitats, including their own wildlife protected areas, to make way for commercial enterprises.
3. The directive to reduce government expenditure was resulting in cuts in social and environmental sectors. This was leading to a reduction in programmes for the conservation and regeneration of natural resources.
4. Opening up of the economy was bringing in companies with a notorious track record on environment (including pesticide manufacturers who had almost wound up in their parent countries), and wasteful consumer goods and toxics which were adding to the country's garbage and health problems.

The debate on the new economic policies of the 1990s has also highlighted another vital aspect of the environmental crisis: the role of international organisations and relations. Much like inequities within the country have fueled the crisis, those

between countries have also resulted in considerable environmental degradation. The most visible was during the colonial era, when colonies were looted of their natural resources by European powers. Several forms of 'neo-colonialism' continue this loot today : unequal trade regimes forcing southern countries to over-exploit their resources to compete in the international market, financial debt burdens which countries try to get rid of by selling off their forests and fish and minerals, foreign aid from multilateral and bilateral donors (notably the World Bank) which primarily finance environmentally-destructive development projects, and aid packages (notably of the IMF) like structural adjustment which drive macro-economic policies further towards unsustainable and inequitable resource use.

TOWARDS SOLUTIONS

People's Efforts

The scale and depth of people's response to the growing environmental crisis in India is quite impressive. Literally thousands of citizens' groups have sprung up in the last two decades or so, forcing their voices into the process of decision-making even where the state has not wanted to hear them. Two broad categories of groups (and individuals) can be recognised here : those who challenge and oppose environmentally destructive activities, and those who carry out regenerative work or build up alternatives to these activities. Of course, neither of these roles is more important than the other, and many groups and individuals are playing both.

Challenges to the destruction of India's environment are as old as the destruction itself. As an example, in many parts of India there was severe, though usually localised, resistance to attempts by the British colonialists to take over forests for commercial exploitation. An even earlier case of resistance to tree-felling is cited from Rajasthan in western India. Over three centuries back, a king's orders to cut several hundred trees was challenged by members of the Bishnoi community, a sect which broke off from mainstream of Hinduism to live a life in harmony with the environment. Two of their central tenets were : never cut a live tree, and never kill an animal. The king's orders were therefore blasphemy to them; they expressed their resistance by hugging the trees slated for cutting. Several Bishnois lost their lives to the King's axemen that day, until in sheer shame the monarch was forced to call the operation off.

Several more recent examples of such successful resistance can be given. In the 1970s, a major World Bank funded project to replace a massive area of natural mixed forests in central India by industrial pine plantations was abandoned after strong local tribal opposition. A move to hand over several thousand hectares of common lands to a private industry in Karnataka (south India) was contested and won in court, backed by considerable local mobilisation. The National Fisherfolk Federation has managed to stop destructive trawling off parts of the Indian coast, and to enforce seasonal fishing restrictions in marine waters. Several major dams have been stopped before or during planning stages by popular local opposition : these include Bodh Ghat, Bhopalpatnam, and Ichampalli in Madhya Pradesh, Silent Valley in Kerala, Vishnuprayag in Uttar Pradesh, and others.

The currently ongoing agitation by the Narmada Bachao Andolan against the Sardar Sarovar (Narmada) Project has redefined the contours of the environment-development debate all over the world, and shown that even as powerful an agency as the World Bank can be successfully challenged. The Andolan has combined massive grassroots mobilisation with incisive critiques of the Project, and generated support amongst a large range of people : scientists, trade unionists, human rights activists, environmentalists, students, even bureaucrats and politicians. Considerable media attention has ensured that Narmada has become almost a household word, symbolising the current conflict between elitist development and the sustainability of resource use. Nor has this been restricted to India; perhaps all over the world, the Narmada debate has become a cause celebre, prompting hundreds of organisations in other countries to direct their attacks at the destructive policies of the World Bank, and forcing the Bank to withdraw from the Project.

The social roots of the environmental crisis are clearly recognised by popular movements like Narmada. They have, therefore, opposed certain measures which are touted as environmental protection by the state, but which in reality are both anti-poor and short-sighted from the conservation point of view. In the early 1980s, a blatantly anti-forest dweller Forest Act drafted by the central government had to be dropped due to nation-wide mobilisation by tribal, human rights, and environmental groups, a similar draft in the early 1990s has also encountered widespread resistance. Increasingly, top-down wildlife protection steps in the country's national parks and sanctuaries are being challenged on human rights grounds, with the assertion that human and wildlife interests have to be reconciled in any biodiversity conservation attempts. Trade unions are joining hands with some sensitive environmental groups to resolve the apparent conflict between environmental protection and employment, a conflict which has become exacerbated by overzealous environmentalists calling for closure of industries and mines without addressing the resulting problems of workers' unemployment. At an international level, groups are becoming wary of the environmental conditionalities being put by several countries (e.g. the recent ban on import of certain Indian textiles by Germany), trying to distinguish between those which are genuinely inspired by consumer concern and those which are disguised attempts at protectionism. As the environmental rhetoric is increasingly picked up by governments and agencies like the World Bank, whose basic developmental thrust remains destructive and inequitous, the environmental movement is having to carefully dissociate itself and voice more sensitive concerns.

It is not a far step from such opposition and resistance, to regeneration and the creation of alternatives. Here too, citizens', efforts in India are many and diverse. The famous Chipko movement in the Himalaya has not only successfully resisted deforestation in several areas, but also shown that community afforestation with indigenous species can be enormously successful. Attempts at reviving traditional, or developing new methods of ecological farming are now widespread. Farmers and citizens' groups have shown that adequate levels of diversified crop production without the use of synthetic chemicals is possible and economically viable, and are increasingly networking amongst themselves to build an effective lobby. A group of energy experts in Bangalore has developed alternative energy scenarios for several states, which

would be far less resource-depleting and environmentally destructive than the current energy generation models. Assisted by engineers and hydrologists with a pro-people bent of mind, communities in diverse ecological zones, including the driest arid areas of western India, have shown that watershed management and simple rainwater harvesting techniques can achieve, at much less ecological, social and financial costs, what big dams cannot. Ralegan Siddhi, Sukhomajri, Jardhar, Seed, Baliraja, etc., are just some of the villages across the country which have reversed ecological degradation and shown alternative developmental models.

Social equity and decision-making by as many of the members of the village as possible, have been essential features of these efforts. For instance, water scarcity in the arid tracts of Maharashtra has been tackled by *Pani Panchayats*, an innovative structure of decision-making in which villagers ensure the equitable distribution of irrigation water. *Van Panchayats* in the Himalayan foothills are attempting the same with forest resources.

The clear lesson from the dynamics of both environmental destruction and environmental reconstruction in India is that people — local communities everywhere — have to be involved in any kind of natural resource management. That is a lesson that even the Indian state is beginning to learn.

Governmental Efforts

Early efforts by the government of independent India to address the environmental issue were restricted to enacting laws and setting up bureaucracies for enforcement. Official policies and programmes have come a long way since then, though for the major part, an essentially top-down approach continues to permeate.

In the last two decades or so, the state has responded to the environmental challenge by a series of steps :

1. Creation of a central agency charged with the protection of environment: Earlier a department, and upgraded in 1980 to a full-fledged Ministry of Environment and Forests, this agency handles environmental clearances for development projects, drafts or revises relevant laws, undertakes centrally funded environmental restoration projects, and so on. Most states also now have a separate ministry in charge of environmental affairs, or merge this portfolio with science and technology and have a separate ministry handling forests and wildlife management.
2. Framing environmental policies : Essentially statements of intent, several policies or policy statements relating to natural resources have been framed by the state. These include forests, water, pollution, and wildlife. An overall conservation policy statement was framed and put forward in the early 1990s, stating the government's view of the relationships between development and environment.
3. Enactment of environmental legislation : A large number of acts are now in operation in India, dealing with forest management and conservation, wildlife conservation, water and air pollution, and other environmental aspects. An overall Environmental Protection Act was passed in 1986, covering clearances for development projects and other general environmental measures, After considerable

pressure, citizens' groups have managed to gain *locus standi* under all the major acts, except the Forest Act of 1927.

4. Formulating and funding environmental programmes : Several major schemes for afforestation, pollution control, wildlife conservation, environmental awareness, and other environmental work have been launched in the last two decades. These include the massive National Wastelands Development Plan, the ambitious project to clean up the river Ganga, and the creation of one of the world's largest networks of national parks and sanctuaries. The country's largest single environmental education effort, the National Environmental Awareness Campaign, is also sponsored by the Ministry of Environment and Forests.
5. Creation of institutional mechanisms to implement laws and programmes. The Forest Department was one of the earliest agencies created by the state to centrally manage a natural resource, dating back to the last century. More recently, wildlife wings (within the Forest Department), central and state pollution control boards, a National Wasteland Development Board and various other agencies at the national, regional, and state level have been set up.

In all the above steps, two major lacuna remain: the lack of any fundamental change in India's overall development thrust, and the absence of public involvement. As a result, many well-meaning efforts (e.g. at afforestation) have, at best, been only partial successes, and at worst, ended up adversely affecting the poor. As an example, social forestry in places has emphasised industrially useful species like Eucalyptus, not only failing to meet the stated aims of providing fuel and fodder needs to the poor, but even causing labour displacement and damage to soils. In the unchanged scenario of inequality, and capital-intensive development, the greed of industry will prevail over the needs of the poor.

Changes are coming, though slowly. The concept of joint management of forests, with controls being exercised by the Forest Department and local village committees together, is catching on after some successful experiments in West Bengal. Increasingly, the government is opening up with information, consulting independent people in official plans and programmes, and in other ways involving citizens.

What Lies Ahead?

There is still a long long way to go before local communities can be centre-stage in decision-making, as they should be; and just as long a way to go before the development process can become truly environment-friendly. While the environmental movement has thrown up a series of exciting and viable alternatives to the current development model, there is an urgent need to merge these into some sort of a holistic ideology and strategy. Answers to the following questions are still being groped for : what sort of national and local political structure would be most responsive to environmental concerns, especially given that these concerns are highly diverse and site-specific? What kind of political ideology, or ideologies are relevant? What does it specifically mean to say social equity in this connection, and how does one achieve it in situations of extreme inequities, as prevalent today? What is the right mix of traditional and modern technologies which can help achieve sustainability, by being

sensitive to local ecological and social conditions? What is the role of traditional political, social, technological, and ideological systems in the context of today's changing world ? How does one resist the forces of materialism sweeping the country, especially in the age of powerful mass media ?

These and other issues present crucial areas of research and action in the years to come, as the environmental movement (if one can call a widely disparate set of people and groups and ideologies that) works its way towards answers. One thing is certain : if answers are to emerge, if we are to achieve some sort of lasting peace with the earth, they will come from this movement, and not from the economists and political ideologues which have so far only headed us towards mass suicide.

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