सत्यमेव जयते
Government of India

Sustainable Development
Learnings and Perspectives from India

Based on a Nationwide Consultative Process

Facilitated by

Ministry of Environment and Forests, Government of India

CEE
Centre for Environment Education

Ministry of Environment and Forests

UNDP

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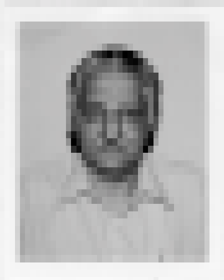
“The earth has enough for everyone’s need but not for anyone’s greed.”

Mahatma Gandhi

पी. वी. जयकृष्णन
P.V. JAYAKRISHNAN



सचिव
भारत सरकार
पर्यावरण एवं वन मंत्रालय
SECRETARY
GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT & FORESTS

FOREWORD

India played a significant role at the United Nations Conference on Environment and Development organized at Rio de Janeiro in 1992. As a nation with a tradition of frugal consumption patterns, an effective legislative and regulatory framework of environmental laws in place, and an active contemporary environmental movement, India has much to share with the international community.

Ten years after Rio, the world is preparing to review and renew its commitment to sustainable development. The World Summit on Sustainable Development (WSSD), scheduled for 26 August – 4 September, 2002 at Johannesburg needs to set a clear path to achieve the goals set out at Rio. The practical difficulties of carrying out the plans and programmes set out in Agenda 21 are apparent. The need for urgency in taking action is no less apparent.

India recognizes in the WSSD, an opportunity to not only take stock of what we have done so far, but also to set the course for the future direction of sustainable development. It is an opportunity not only for those closely associated with environmental issues to discuss these concerns and initiatives, but also to reach out and bring the concept of sustainable development to the consciousness of society at large.

It was with this objective, the Ministry of Environment and Forests (MoEF), Government of India, planned several initiatives such as review of policies in the background of Agenda 21, multi-stakeholder consultations; a sustained media campaign; websites to give information on India's preparations towards the Summit, an informed debate on policy issues of relevance, and a nationwide children's competition on themes related to sustainable development.

This document is the outcome of the multi-stakeholder consultations organized by the Centre for Environment Education (CEE), with support from the MoEF. Seven Regional Consultations and several smaller, theme specific meetings were organized. These consultations discussed general sustainable development concerns, and two or three specific themes of relevance to that region. The discussions at these Consultations were distilled into a draft document, which was placed for discussion at a National Consultation held at New Delhi in May 2002. The National consultation brought together over 150 representatives from several central Ministries, state governments, NGOs, academic institutions, and civil society

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organizations. The draft document has been widely shared both through mailing copies to key individuals and agencies, and through a web forum. The present document finalized based on inputs received from various cross sections of society does not necessarily reflect official views. However, this is an attempt to bring out plurality of our society.

The first chapter represents the thinking and perspective on sustainable development issues, and provides 'guiding principles' to define the path that India needs to follow in its quest for sustainable development. The subsequent chapters look at sectoral issues and attempt to capture the views expressed at the Consultations and other processes.

Over a thousand people representing a wide range of stakeholder groups – central and state government officials, representatives of NGOs, CBOs, industry, women's groups, farmers, youth, academicians, etc. have contributed to this document through this consultative process. Keeping in view the spirit of the process, participants recognized and analyzed the successes and failures of the last ten years. They made suggestions and recommendations for the future course of action. The discussions and exchange of views were frank and open, generally without rancour or suspicion.

This document is, therefore, significant not only a product, but also because of the highly participatory process through which it has evolved. The process has also helped us in re-focusing our commitment to sustainable development initiatives. The learning and perspectives that's India in the form of this document are expected to promote sustainable development at local, national and international levels.

Dated : 6th August, 2002

Place : New Delhi

The Process

Inputs of over a thousand persons concerned with various facets of sustainable development from across the country have shaped the contents to this document. This was part of the multi-stakeholder consultative process undertaken in the country in preparation for WSSD. These contributions have come in through a series of consultations, web-based discussions and individual communications. These processes were organized through CEE's offices in various parts of the country. Seven Regional Consultations, several smaller Specific Focus meetings, and a National Consultation were organized between January 2002 and May 2002. People from various sectors and backgrounds participated in these processes. The list of people from government, NGOs, industries, academics and civil society organizations who participated in these processes which has resulted in the rich and diverse views presented in this document, are given at the end of the book.

The wealth of views and perspectives were compiled and organized into broad thrust areas by a group of facilitators at CEE. This document is the result of this exciting and enriching process. We see this not as the culmination, but rather as the beginning of continuing and continuous discussion and dialogue.

Kartikeya V. Sarabhai
Director
Centre for Environment Education

Sustainable Development in India: Perspectives

In 1972, the then Prime Minister of India, Mrs. Indira Gandhi emphasized, at the UN Conference on Human Environment at Stockholm, that the removal of poverty is an integral part of the goal of an environmental strategy for the world. The concepts of interrelatedness, of a shared planet, of global citizenship, and of 'spaceship earth' cannot be restricted to environmental issues alone. They apply equally to the shared and inter-linked responsibilities of environmental protection and human development.

History has led to vast inequalities, leaving almost three-fourths of the world's people living in less-developed countries and one-fifth below the poverty line. The long-term impact of past industrialization, exploitation and environmental damage cannot be wished away. It is only right that development in this new century be even more conscious of its long-term impact. The problems are complex and the choices difficult. Our common future can only be achieved with a better understanding of our common concerns and shared responsibilities.

Following are some perspectives and approaches towards achieving a sustainable future:

Poverty Eradication and Sustainable Livelihoods

Poverty and a degraded environment are closely inter-related, especially where people depend for their livelihoods primarily on the natural resource base of their immediate environment. Restoring natural systems and improving natural resource management practices at the grassroots level are central to a strategy to eliminate poverty.

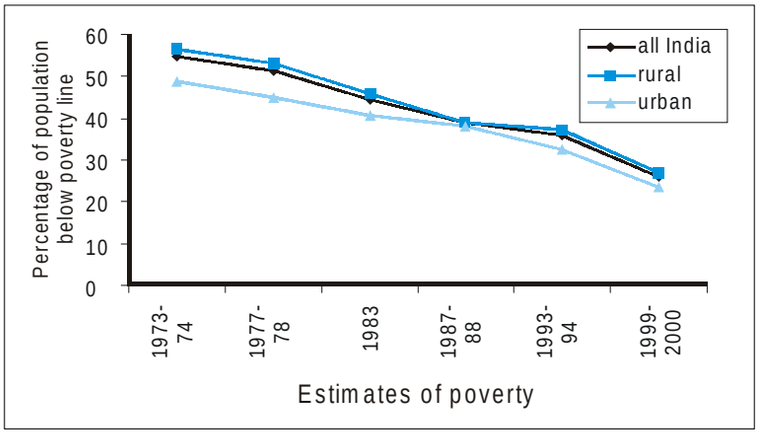
The survival needs of the poor force them to continue to degrade an already degraded environment. Removal of poverty is therefore a prerequisite for the protection of the environment.

Poverty magnifies the problem of hunger and malnutrition. The problem is further compounded by the inequitable access of the poor to the food that is available. It is therefore necessary to strengthen the public distribution system to overcome this inequity.

Diversion of common and marginal lands to 'economically useful purposes' deprives the poor of a resource base which has traditionally met many of their sustenance needs.

Market forces also lead to the elimination of crops that have traditionally been integral to the diet of the poor, thereby threatening food security and nutritional status.

While conventional economic development leads to the elimination of several traditional occupations, the process of sustainable development, guided by the need to protect and conserve the environment, leads to the creation of new jobs and of opportunities for the reorientation of traditional skills to new occupations.



Source: Ministry of Finance (2002)

Women, while continuing to perform their traditional domestic roles' are increasingly involved in earning livelihoods. In many poor households they are often the principal or the sole breadwinners. A major thrust at the policy level is necessary to ensure equity and justice for them.

Literacy and a basic education are essential for enabling the poor to access the benefits offered by development initiatives and market opportunities. Basic education is therefore a precondition for sustainable development.

A sizeable proportion (about 60 per cent according to some estimates) of the population is not integrated into the market economy. Ensuring the security of their livelihoods is an imperative for sustainable development.

Changing Unsustainable Patterns of Consumption and Production

With increasing purchasing power, wasteful consumption linked to market driven consumerism is stressing the resource base of developing countries further. It is important to counter this through education and public awareness.

In several areas, desirable limits and standards for consumption need to be established and applied through appropriate mechanisms including education, incentives and legislation.

Several traditional practices that are sustainable and environment friendly continue to be a regular part of the lives of people in developing countries. These need to be encouraged rather than replaced by more 'modern' but unsustainable practices and technologies.

Development decisions regarding technology and infrastructure are a major determinant of consumption patterns. It is therefore important to evaluate and make development decisions which structurally lead to a more sustainable society.

Technologies exist through which substantial reduction in consumption of resources is possible. Efforts to identify, evaluate, introduce and use these technologies must be made.

Subsidies often lead to wasteful and unsustainable consumption by distorting the value of a resource. All pricing mechanisms must be evaluated from a sustainable development point of view.

Protecting and Managing the Natural Resource Base of Economic and Social Development

The integration of agriculture with land and water management, and with ecosystem conservation is essential for both environmental sustainability and agricultural production.

An environmental perspective must guide the evaluation of all development projects, recognizing the role of natural resources in local livelihoods. This recognition must be informed by a comprehensive understanding of the perceptions and opinions of local people about their stakes in the resource base.

To ensure the sustainability of the natural resource base, the recognition of all stakeholders in it and their roles in its protection and management is essential.

There is need to establish well-defined and enforceable rights (including customary rights) and security of tenure, and to ensure equal access to land, water and other natural and biological resources. It should be ensured that this applies, in particular, to indigenous communities, women and other disadvantaged groups living in poverty.

Water governance arrangements should protect ecosystems and preserve or restore the ecological integrity of all natural water bodies and their catchments. This will maintain the wide range of ecological services that healthy ecosystems provide and the livelihoods that depend upon them.

Biomass is, and will continue for a long time to be, a major source of fuel and energy, especially for the rural poor. Recognizing this fact, appropriate mechanisms must be evolved to make such consumption of biomass sustainable, through both resource management and the promotion of efficient and minimally polluting technologies, and technologies which will progressively reduce the pressures on biomass, which cause environmental degradation.

The traditional approaches to natural resource management such as sacred groves and ponds, water harvesting and management systems, etc., should be revived by creating institutional mechanisms which recapture the ecological wisdom and the spirit of community management inherent in those systems.

Sustainable Development in a Globalizing World

Globalization as it is taking place today is increasing the divide between the rich and the poor. It has to be steered so that it serves not only commercial interests but also the social needs of development.

Global business thrives on, and therefore encourages and imposes, high levels of homogeneity in consumer preferences. On the other hand, for development to be locally appropriate and sustainable, it must be guided by local considerations which lie in cultural diversity and traditions. Therefore recognition at the policy level, of the significance of diversity, and the need to preserve it, is an important precondition for sustainable development.

In an increasingly globalizing economy, developing countries, for want of the appropriate skills, are often at a disadvantage in negotiating and operating multilateral trade agreements. Regional cooperation for capacity building is therefore necessary to ensure their effective participation in all stages of multilateral trade.

Globalization is driven by a vast, globally spread, human resource engine involving millions of livelihoods. Their security is sometimes threatened by local events causing global distortions (e.g. the impact of the WTC attack on jobs in India or, in a wider context, sanctions against countries not conforming to 'international' prescriptions in human rights or environment related maters). Mechanisms to safeguard trade and livelihoods, especially in developing countries, must be evolved and negotiated to make globalization an effective vehicle of sustainable development.

War and armed conflict are a major threat to sustainable development. It is imperative to evolve effective mechanisms for mediation in such situations and to resolve contentious issues without compromising the larger developmental goals of the conflicting parties.

Health and Sustainable Development

Human health in its broadest sense of physical, mental and spiritual well-being is to a great extent dependent on the access of the citizen to a healthy environment. For a healthy, productive and fulfilling life every individual should have the physical and economic access to a balanced diet, safe drinking water, clean air, sanitation, environmental hygiene, primary health care and education.

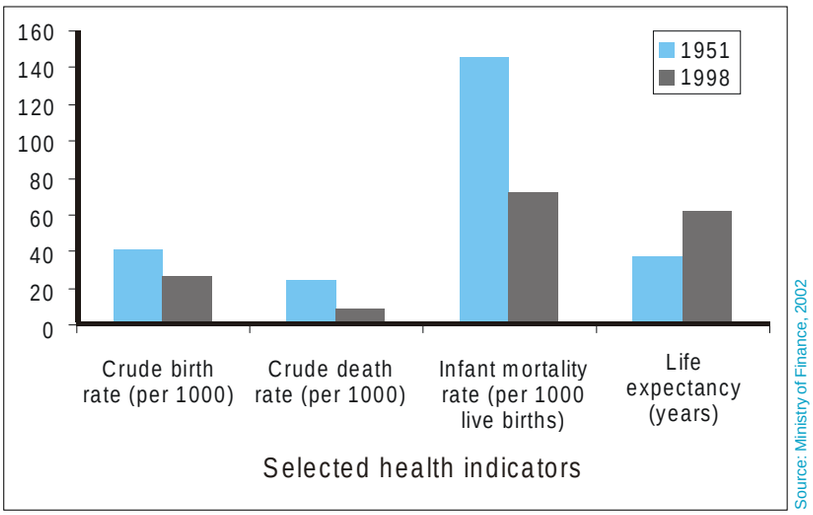
Access to safe drinking water and a healthy environment should be a fundamental right of every citizen.

Citizens of developing countries continue to be vulnerable to a double burden of diseases. Traditional diseases such as malaria and cholera, caused by unsafe drinking water and lack of environmental hygiene, have not yet been controlled. In addition, people are now falling prey to modern diseases such as cancer and AIDS, and stress-related disorders.

Many of the widespread ailments among the poor in developing countries are occupation-related, and are contracted in the course of work done to fulfil the consumption demands of the affluent, both within the country and outside.

The strong relationship between health and the state of the environment in developing countries is becoming increasingly evident. This calls for greater emphasis on preventive and social medicine, and on research in both occupational health and epidemiology.

Because of the close link, there needs to be greater integration between the ministries of Health and Environment, and effective coordination and cooperation between them.



Source: Ministry of Finance, 2002
National Population Policy, 2000

Basic health and educational facilities in developing countries need to be strengthened. The role of public health services must give preventive health care equal emphasis as curative health care. People should be empowered through education and awareness to participate in managing preventive health care related to environmental sanitation and hygiene.

Most developing countries are repositories of a rich tradition of natural resource-based health care. This is under threat, on the one hand from modern mainstream medicine, and on the other from the degradation of the natural resource base. Traditional medicine in combination with modern medicine must be promoted while ensuring conservation of the resource base and effective protection of IPRs of traditional knowledge.

Developing countries should also strive to strengthen the capacity of their health care systems to deliver basic health services and to reduce environment-related health risks by sharing of health awareness and medical expertise globally.

Means of Implementation

Finance

Overseas Development Assistance (ODA) is declining. The commitments made by industrialized countries at the Earth Summit in Rio a decade ago remain largely unmet. This is a cause for concern which has been voiced

by several developing countries. Industrialized countries must honour their ODA commitments.

The new instruments and mechanisms, e.g., the Clean Development Mechanism, that are trying to replace ODA need to be examined closely for their implications for the developing countries.

In view of the declining trend in ODA, developing countries must explore how they can finance their sustainable development efforts, such as by introducing a system of ecological taxation.

Private investment cannot replace development aid as it will not reach sectors relevant for the poor. Such investments and other mechanisms can at best be additional to, not replacements for, development assistance.

Conditions attached to financial assistance need to be rigorously scrutinized, and the assistance accepted only if the conditionalities are acceptable. Financial support for sustainable development programmes must not be negatively influenced by political considerations external to the objectives of the assistance.

We cannot have a ecological movement designed to prevent violence against nature, unless the principle of non-violence becomes central to the ethics of human culture

Mahatma Gandhi

Trade

Trade regimes, specifically WTO, are sometimes in conflict with sustainable development priorities. Imperatives of trade, and the concerns related to environment, equity and social justice however need to be dealt with independently.

Environmental and social clauses which are implicitly or explicitly part of international agreements must not be used selectively to erect trade barriers against developing countries.

Developing countries will suffer a major trade disadvantage if the efforts to put in place globally acceptable Process and Production Methods (PPMs) are successful. Instead, existing disparities between the trade regimes and multilateral environmental agreements, such as those between Trade Related Intellectual Property Rights (TRIPS) regime and the Convention on Biological Diversity (CBD), should be thoroughly addressed. Mechanisms to resolve such conflicts between multilateral agreements should be set up.

Technology

Developing countries need not follow the conventional path to development with regard to technologies but must use to their advantage the cutting-edge technology options now available to 'leapfrog', and put the tools of modern technology to use.

Mechanisms must be put in place to make available to developing countries the latest technologies at reasonable cost.

Technology transfer must be informed by an understanding of its implications in the social, economic and environmental contexts of the receiving societies.

Technologies must be usable by and beneficial to local people. Where possible, existing local technologies must be upgraded and adapted to make them more efficient and useful. Such local adaptations should also lead to the upgradation of local technical skills.

Local innovations and capacity building for developing and managing locally relevant and appropriate technologies must be encouraged and supported.

Integrating highly-sophisticated modern technology with traditional practices sometimes produces the most culturally-suited and acceptable solutions, which also makes them more viable. This trend should be encouraged.

Science and Education

The paramount importance of education in effecting social change is recognized. Mainstream education must now be re-aligned to promote awareness, attitudes, concerns and skills that will lead to sustainable development.

Basic education which promotes functional literacy, livelihood skills, understanding of the immediate environment and values of responsible citizenship is a precondition for sustainable development. Such education must be available to every child as a fundamental right, without discrimination on the basis of economic class, geographical location or cultural identity.

Annu Saini
WSSD School Competition

Adequate resources and support for education for sustainable development are essential. An understanding must be promoted among key decision makers of the potential of education to promote sustainability, reduce poverty, train people for sustainable livelihoods and catalyze necessary public support for sustainable development initiatives.

The empowerment of women and girls must be supported by actions to improve their access to basic and higher education, training and capacity building. The emphasis should be on gender mainstreaming.

Greater capacity needs to be built in science and technology through improved collaboration among research institutions, the private sector, NGOs and government. Collaborations and partnerships between and among scientists, government and all stakeholders, on scientific research and development and its widespread application need to be improved.

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Population

With India's population crossing a billion in the year 2000, the National Population Policy announced in that year has special significance. Its change in focus from merely setting target population figures to achieving population control through greater attention to socio-economic issues such as child health and survival, illiteracy, empowerment of women, and increased participation by men in planned parenthood, gives it greater breadth and depth, thereby holding forth better promise of achieving its long-term objective of a stable population by mid-century.

The official realization, that population is not merely about numbers but about the health and quality of life of people in general and women in particular, must be reinforced and sustained by an informed debate to bring key population issues into ever sharpening perspective at various levels of policy making from the national and state legislatures to local government institutions.

There is need for a better and more widespread understanding that the number of children desired by any couple depends on a large and complexly interrelated number of socio-economic and cultural factors, and that any policy action seeking to control population must seriously take all these variables into account.

An important part of empowering women in matters pertaining to population, is to explicitly recognize and respect their rights over their bodies and their reproductive behaviour. This recognition must permeate society in general, and religious, judicial and law-enforcement institutions in particular, through continual campaigning and dialogue.

The pursuit of population control must not be allowed to compromise human rights and basic democratic principles. Such compromises are often implicit in the disincentives aimed at controlling family size; in comments on the fertility of particular social groupings; and in the occasional demands to control in-migration to metropolitan areas. It is essential to place these matters in a balanced and rational perspective through informed public discourse supported by the wide dissemination of authentic data.

You must be the change you wish to see in the world

Mahatma Gandhi

Strengthening Governance for Sustainable Development at the Local, National and International Levels

Local

Effective management of resources requires participation by all stakeholders. At the local level, strengthening democratic institutions generally leads to better and more sustained management of natural resources.

To enhance effectiveness of people's participation in local governance,

committees comprising both elected and executive members of local bodies and representatives of community groups, must be formed. Appropriate capacity building would enable them to undertake local development activities according to community priorities, monitor project implementation and manage community assets. Where the conditions for such community empowerment have already been created, as in India through the 73rd and 74th amendments of its Constitution, effective implementation of the provisions should be ensured.

All members of society are the stakeholders of sustainable development. Women make up half of this group. Affirmative action to ensure representation and power to women in local governance, and appropriate capacity building, are necessary to make them effective and equal partners in the development process.

Social groups which have been traditionally discriminated against must be represented in local governance and empowered to ensure that they become effective and mainstream partners in development.

Children are a valuable asset of every society. It is the responsibility not only of the parents but of the community that children realize their potential fully, growing up in a healthy, enriching and fulfilling environment. Ensuring the provision of such an environment is a major challenge of governance at the local level.

The occupational, cultural and economic heterogeneity of population is on the whole a major asset in making development sustainable; but there are times of crisis when the same heterogeneity can become the basis of conflict and social insecurity. It is imperative to evolve participatory mechanisms of governance involving citizen groups and local authorities which will provide effective means of conflict resolution.

National

Sustainable development is achieved through optimizing gains from several variables, rather than maximizing those from a single one. This requires government departments, by convention sectorally organized, to work together, or in some cases as a single multi-disciplinary authority. For this joint planning, transparency and coordination in implementation are required.

The richness of skills available in society must be harnessed through partnerships involving institutions in civil society, such as NGOs, CBOs, corporate (including private) bodies, academic and research institutions, trade unions, etc., which must be made an integral part of planning and implementation for sustainable development.

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There is on the one hand a surfeit of laws, many of them outmoded and irrelevant. On the other hand, effective enforcement is lacking in respect of laws relevant to contemporary concerns and conducive to governance. This calls for a thorough review of laws, elimination of those which are outmoded, and simplification of the procedures for implementing those which are relevant.

Internal reviews as well as learnings from international experience should be the basis of identifying and filling gaps in existing laws. It must, however, be recognized that laws in themselves do not provide solutions, unless there are mechanisms to effectively enforce them.

There are many traditional systems and practices whose value and validity needs to be recognized and brought into the mainstream of governmental development thinking and policy. Appropriate mechanisms for integrating them need to be created.

Many policies were framed either before sustainable development became a major concern or in a sectoral perspective. These need to be reviewed from the point of view of sustainable development. All future policies must be guided by considerations of sustainable development.

Areas lacking policies should be identified and adequate policies compatible with the imperatives of sustainable development framed, taking into account successful examples, of policies and initiatives in similar areas.

International

There is both a need and a scope for regional and global cooperation in sustainable development. Some of the areas of common concern are marine and riparian issues, transboundary environmental impacts, management of bioresources, technology sharing and sharing of sustainable development experiences.

Efforts must be made, especially by developing countries, to work towards synergizing experiences and raising shared regional concerns as a strong united front in international forums. Mechanisms must be put in place to facilitate such international exchange of domestic and global experiences in sustainable development.

There must be mechanisms for monitoring the compliance of countries to their obligations under various environmental agreements. Currently there is a multiplicity of institutions with fragmented responsibilities. A better governance regime is required to ensure cooperation and compliance.

You have to decide whether development means affluence or whether development means peace, prosperity and happiness.

Sunderlal Bahuguna

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1. Governance

Promotion of sustainability in the processes of production, distribution and consumption is a crucially important aspect of governance, internationally as well as nationally. Sustainable development encompasses many aspects of a society. These include, among others, laws, policies and mechanisms for their implementation, institutions, equity, gender sensitivity, national and international agreements and conventions, democratic processes, people's participation in decision-making down to the lowest levels, cultural diversity and ecological concerns. Governance relates to the structure and functioning of the governments and the institutional infrastructure and power structures in the civil society. Governance promoting and supporting sustainable development will have:

- Social and political leadership and a bureaucracy that are well-informed and concerned about sustainable development, prepare the people at large for sustainability imperatives, and keep the distant future in focus as much as the present;
- Institutions that are functioning democratically with transparency, accountability and synergy;
- Participation of stakeholders at different levels in decision-making and, where possible, in implementation;
- Focus turned on the basic development needs,- e.g., poverty eradication and protecting the environment.
- Laws and policies reflecting viable reconciliation of the country's development needs and conservation imperatives, geographical and cultural diversity, equity and gender concerns.

It is only in freedom that anything can flourish, not in suppression, in control and discipline; these only corrupt.

J.Krishnamurti

Learnings and Perspectives

- 'Polluter pays' principle is to be made more far-reaching by bringing under the definition of the word 'polluter', all those who are responsible for degrading land, forest, biodiversity and other important elements of the environment.
- Certain laws need to be revised to reflect changing realities. For example, the Forest Conservation Act and the Mining Act need to be recast in such a way that, in case of the former, both the interests of the poor and the need for conservation are addressed, while in case of the latter, the mined lands are regenerated, and royalties charged, to spur efficiency in the mining sector as a whole.
- Security, peace and stability are vital for sustainable development.

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Governments and civil society institutions should collaborate and actively work towards creating respect for the rule of law at all levels.

- While both the private and public sector have crucial roles in the economy, natural resources such as forests, fragile ecosystems and other types of biodiversity are unlikely to be conserved if left entirely to the market forces. Millions of poor Indians depend for their livelihood on these natural resources. The resources, therefore, require large-scale participation of the local people, and institutions for conservation-oriented and sustainable-use-friendly management.

- There must be strict enforcement of conservation-promoting laws without outside interference. Some of these laws and their implementation require public hearings, which must be carried out in meaningful ways.

- Mechanisms need be created to ensure accountability within the government and the civil society for conservation, environmental integrity and affirmative actions in favour of the poor.

- Ownership and rights issues are very important in case of certain natural resources. Thus, ownership, rights and management responsibilities with regard to forests and water, assume great importance from the point of view of their conservation, development and the livelihoods of the poor.

- The environment is indivisible, interconnected with social systems. Under such circumstances, effective governance is not possible, with exclusive departments and highly specialized institutions. There must be conscious and urgent efforts for close coordination among the departments, within an agreed-upon framework of sustainable development. Highly specialized government and non-government institutions should also look at issues from more than one perspective.

- It will be desirable to take management of natural resources down to the users' level. Panchayati Raj (local self government) Institutions should be given the responsibility to manage natural resources. However, their capacity must be built to manage these resources sustainably before they assume these responsibilities.

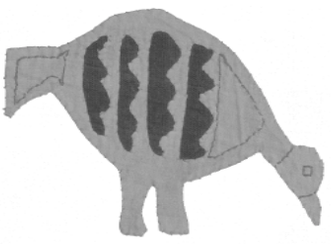
- In an age of globalization, liberalization and privatization, the most vulnerable are the environmental resources, the poor and sovereignty. International treaties, conventions and mechanisms, should be evaluated on the basis of these three aspects, among others. Environmental and social issues must not be allowed to be related, especially as encumbrances, to international trade.

- Research and field-level experimentation for sustainability-enhancing technologies and practices should receive high priority and allocation of funds, especially in sectors such as energy, organic farming and biodiversity conservation. Traditional health practices and conserving the plants and other material used, should be encouraged and systematized.

- Sudden natural disasters and environmental disasters that occur as a culmination of various natural and human activity related processes require on-going study, planning and preparedness for impact minimization. Recurring droughts in drought-prone areas with consequent crop failures and severe water scarcity, cyclones in states like Andhra Pradesh and Orissa, floods in northern and north-eastern states are phenomena that cause enormous resource damage and human misery. Disaster management including preventive measures and preparedness at the community as well as government level must assume high priority for both state and central governments.
- The need for expanded policy and financial support for education for sustainability in both the formal education system at all levels and the non-formal education system, including NGO initiatives, cannot be stressed too much. Large-scale people's involvement in, and support for, measures that promote sustainability are not possible without proper understanding and concern for sustainability.
- Without decentralized planning, the issues of diversities in economic status, environmental conditions, resource endowments and cultural beliefs, customs and practices cannot be adequately addressed. Decentralized planning is also desirable in order to include divergent stakeholder groups' perspectives, knowledge bases and aspirations into planning. Such planning is especially called for in sectors such as water, biodiversity, common property resource development, health and education infrastructure.
- Transparency and right to information are closely related. In order to increase credibility of government departments and civil society institutions, both right to information and transparency should be institutionalized and legislated.
- Special measures in the form of legal provisions as well as programmes involving the local community, need to be taken in order to strictly protect very fragile ecosystems such as mountains, deserts and marine ecosystems, all of which are under great threat from conventional development demands and processes.
- Adequate legislation is urgently needed for ensuring bio-safety and against bio-piracy.

"In India, our strength is that we are democratic and open. People can raise their voices. Therefore, we need to strengthen grassroot democratic institutions, down to the village level. Today panchayats have the possibility to be part of planning."

Madhav Gadgil
Multi-stakeholder Consultation



Democracy must in essence, therefore, mean the art and science of mobilizing the entire physical, economic and spiritual resources of the people in the service of the common good of all.

Mahatma Gandhi

2. Globalization

While 'Sustainable Development' was a term popularized in the eighties, 'Globalization' is a word which was widely discussed in the early nineties. Both the terms mean different things to different people. The latter has been used to describe what has been 'happening' during the period. The former refers to 'how' it should have been. The challenge is to marry the two, to have 'globalized sustainable development'. With the liberalization of the economy and the Information Technology revolution in the last decade, India has increasingly become part of the globalization process.

Globalization has been possible due to opening up of economies and increased trade opportunities around the world. India's Country report to the Commission of Sustainable Development states: 'India believes that in order to make trade and environment mutually supportive, it is necessary to have an open multilateral trading system which makes possible a more efficient allocation and use of resources. This contributes to increased production and incomes, and lessens the demands on the environment. It also provides the additional resources needed for economic growth and development, and improved environmental protection. Trade measures should be applied for environmental purposes only when they address the root causes of environmental degradation so as not to result in an unjustified restriction on trade. Further, environmental standards valid for developed countries may have unwarranted social and economic cost in developing countries. India believes that global efforts at environmental protection are best addressed through Multilateral Environmental Agreements (MEAs), which contain a package of positive measures, including among them financial and technological transfers and capacity building.'

This is the key to India's stand on environmental issues with respect to economic development and trade and its participation in WTO. To benefit from the effects of globalization, it becomes crucial that India has policies which are coherent to international trade regimes. However it is accepted that the social and environmental responsibilities and priorities cannot be compromised for short-term ends. India's eighth and ninth five-year plans, and its export-import and industrial policies have been conducive to promoting globalization. At the same time, an equally strong policy has been developing for preserving and safeguarding the environment.

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Learnings and Perspectives

2.1 Steering Globalization to Serve Socio-economic and Environmental Imperatives

Globalization is a process which does not have a charter of its own. It is for governments, concerned institutions and civil society to oversee that it does not serve commercial interests alone. Globalization should be seen as a major means for alleviating poverty and addressing the social needs of the country. Globalization and liberalization have brought to the fore the prominent role of the corporate sector. However, as these changes have been induced in response to emerging situations rather than in a systemic manner, the role of the corporate sector as a tool for social development needs to be properly defined.

- Globalization as it is happening today is broadening the divide between the rich and the poor. Globalization has to be steered so that it serves the social needs of the developmental process and not just commercial interests. Planning has to be done so that investments and trade are more focused on programmes that address sustainable growth that benefits all. The role of government would be to guide trade liberalization policies and Foriegn Direct Investments (FDIs) in investing more in environmentally sustainable initiatives. At the WSSD, the aim should be to encourage international and regional institutions as well as institutions in source countries to increase their support for private foreign investment in infrastructure development and other priority areas, including projects to bridge the digital divide, social, economic and environment gaps in developing countries .

- Many of the world's poor live in environmentally degraded systems, which are unproductive and the root cause of poverty. Thus 'economic' poverty in many parts of the world is due to 'ecological 'poverty of the area. It is the restoration of these natural systems, and through natural resource management practiced at the grassroots level, that will help in eliminating poverty. A massive global enterprise for ecological regeneration and for building up the natural resource base that would help the poor in all rural communities throughout the world, needs to be undertaken. Poverty alleviation by removing ecological poverty should be the major goal of globalization. Livelihoods based on the local natural resource base, which are not drastically affected by international market trends and mechanisms, and are largely self-sufficient, would lead to self-reliance and sustainability.

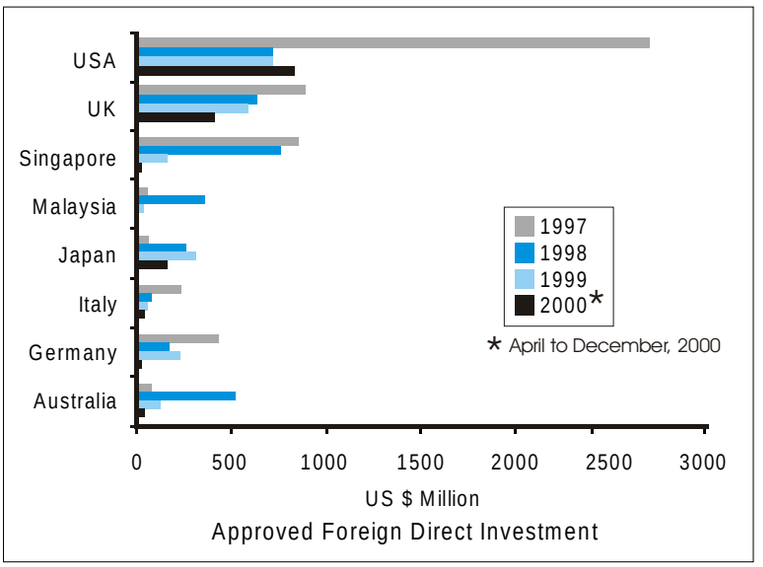
- Basic health and educational facilities need to be strengthened in developing countries including India. Globalization in fields of health, education and awareness is still not adequate. Health as well as education services show wide disparities around the world. The need is for wider access and sharing of resources for these, at a global and regional level. International multilateral arrangements should provide for regular sharing and exchange of medical expertise, and innovations and collaborations in

developing educational infrastructure and services. Existing institutional mechanisms like the UN agencies (WHO, UNICEF etc.) should be effectively utilized to fulfill these objectives. The aim should be to implement Health for All Strategy and should emphasize the fulfillment of commitments to support the global fund to fight AIDS, tuberculosis and malaria.

- For increasing educational services, an increase in allocation of ODA for infrastructure development for education is needed. The aim should be to encourage international support, including mobilization of financial resources for regional centres of excellence for education and research, that would contribute to the development of the knowledge capacity of developing countries .

- There are instances of conflicts between trade and environmental issues, which are presently addressed through WTO's Dispute Settlement Mechanisms (DSM). It is increasingly being felt that trade interests often take precedence over environmental priorities in such settlements. Review of such mechanisms in WTO, or arrangements for placing them under the framework of Multilateral Environmental Agreements (MEAs), could be considered.

2.2 Providing a Level Playing Field in Trade Agreements



Source: Statistical Outline of India, 2001-2002, Tata Services Limited

Trade is a more enabling mechanism than aid, and should be promoted to strengthen the economies of poor nations. Globalization has meant more trade and opportunities for trade between developed and developing countries. On an international scale, agreements such as WTO take care of trade practices and rules to be followed by trading countries. It has been felt that some trade provisions in WTO are more favourable for the North. To enable all countries to be equally benefited by globalization, a review of such provisions is needed. This review must involve developing countries.

- There should be increased participation of developing countries and Southern NGOs in WTO and other trade related agreements. Capacity building of developing countries to be an equal partner in such negotiations is urgently needed. This would also ensure that their concerns and interests are adequately addressed in such global fora.

- Major international trade agreements like the WTO should provide for equal opportunities of trade for all countries. Restrictive trade barriers and

practices must be curtailed, and tariffs, particularly peak tariffs, on exports of products and services from developing countries reduced, so that the benefits of global economic growth are equitably distributed among all countries. Greater trading opportunities can enable developing countries to invest more in environmental protection.

- Certain injunctions and agreements within WTO may have negative impacts on key Indian sectors including agriculture and water. The issues of higher subsidies for agriculture in the North and phytosanitary measures in agriculture for South as part of WTO are of much concern to India. The need is to protect and develop the country's domestic food production, increase the ability of poor to afford food, and provide a competitive edge to Indian crops over subsidized foreign crop produce. The appeal at WSSD should be to fulfill the WTO Doha commitment to initiate negotiations aimed at substantial improvements in market access for agricultural products, and reductions, with a view to phasing out, of all forms of export subsidies, and substantial reductions in trade-distorting domestic support, with special and differential treatment for developing countries .

"We should demand access to international markets and reduction of tariff and non-tariff barriers."

Neelima Jerath
Multi-stakeholder Consultation

- There are apprehensions that under WTO, water could be treated as a tradable commodity and not a Common Property Resource (CPR). This may threaten subsistence and livelihood needs of many in India. The need is to look into such clauses of WTO agreements and to renegotiate them so that they are more suitable to Indian needs and practices.

- WTO talks of uniform standards for production, packing and forwarding across the world. However, the specific production process to be used would depend upon the absorptive capacities and development priorities of the country concerned, and hence no global harmonized standards for production processes can be developed. India already has environmental standards for products and processes; it has environmental impact assessment and has introduced environmental audit as well as an eco-labelling scheme.

- In recent years, the EIT (Economies In Transition) countries are being increasingly treated at par with developing countries. This is leading to a substantial part of financial aid being diverted to the EITs which do not need them as much as the developing countries. The priorities for granting aid should be guided based on need and periodical assessment of the transition which the countries are undergoing.

2.3 Mitigating Negative Impacts

There are many facets to globalization, including some negative ones. Globalization may negatively affect the socio-economic, environmental and cultural milieu of a country, both directly and indirectly. Greater international cooperation is required to tackle the negative influences of globalization.

- Globalization in its environmental dimension refers to the increasingly related nature of environmental problems. Global warming is the best

example, where gas emissions from around the world combine to alter the global climate. The responsibility of reducing global environmental impacts lies with every country, but as a differentiated responsibility. Developed countries like the US cannot go back on major commitments, and global consensus for marginalizing such defaulters should emerge. Per capita emission quotas for greenhouse gases are equitable and justified.

I want the cultures of all the lands to be blown about my house as freely as possible. But I refuse to be blown off my feet by any.

Mahatma Gandhi

- Across the world, increased consumption accompanying globalization is a matter of concern. The issue needs to be addressed via both technological and educational means. This would mean an increased role for media and other public information tools in raising consumer awareness on the importance of sustainable production and consumption patterns. Incentives as well as technical assistance to industries for adopting cleaner and energy-efficient technologies should also be a priority.

- Economically, globalization has meant more capital and resources for corporations. This provides them greater influence on policy and planning, which is often not conducive to sustainable development. The US opting out of Kyoto Protocol or extending the phase-out plan for methyl bromide (ODS) in response to pressures from industries are examples of this. While globalization will mean economically powerful corporations in all developing countries, a clearly defined policy with regard to social and environmental causes will help to keep the balance between economic and industrial development on one hand, and environmental concerns. on the other. The government should acknowledge the role of private sector as a 'global actor', but at the same time have adequate institutional and regulatory capacities in interactions with the private sector.

- Globalization has impacts on cultural diversity and traditional knowledge. India, which is very rich in both, must pay special attention to safeguard against the negative impacts of globalization on these.

- Globalization must also mean greater movement of human resources and knowledge pools. However this must be on fair terms. India has developed a good human resource base for the IT sector and global IT corporates have been quick to access this resource, often at remunerations considerably lower than prevalent. Brain drain is however a concern.

- New information tools have enabled greater accessibility and transferability of knowledge around the globe. Patenting of traditional Indian knowledge by MNCs and other organizations in the past decade testifies to these apprehensions. Effective policies and monitoring mechanisms to prevent exploitation or undermining of the country's knowledge base need to be in place.

- Terrorism has now become a global phenomenon. Greater regional and international cooperation is needed to fight the forces of terror.

- Wars have a negative impact on the environment. Efforts aimed at reducing tensions between countries and resolving conflicts to avoid wars should be a priority area of concern.

3. Financing And Technology Transfer

As a developing nation faced with the task of ensuring speedy development while at the same time safeguarding environment concerns, India needs to explore and establish those forms and models of development that are sustainable, i.e., environmentally safe, feasible over a long term, with benefits and stakes extending to wide groups of society, and replicable.

Financing for Sustainable Development

As mentioned in the UNCED Report, economic growth, social development and poverty eradication are the first and overriding priorities in developing countries and are themselves essential for meeting national and global sustainability objectives. In the light of the global benefits to be realized by the implementation of *Agenda 21* as a whole, the provision to developing countries of effective means, *inter alia*, financial resources and technology, without which it will be difficult for them to fully implement their commitments, will serve the common interests of developed and developing countries and of humankind in general, including future generations.

Sustainable development has economic, social, cultural and environmental dimensions. While financial resources are essential for sustainable development, they are, on their own, not sufficient for achieving it. Without proper policies, consumer and producer behaviour will not shift to more sustainable patterns, and the financing gap will remain wide. Good policies hold the promise of not only being able to mobilise new financial resources but also reducing such a need. Three major sources for sustainable development are relevant: (i) external fund flows (particularly ODA for poor nations), debt relief, foreign private capital flows, and multilateral finance (especially IMF, World Bank and regional development banks); (ii) domestic resource mobilisation through new fiscal resources, public expenditure reforms and redirection of resources for sustainable development; and (iii) promoting innovative financial mechanisms (national, regional and international) for sustainable development, including new international taxes/charges (such as Tobin tax and international air transport levy), innovative carbon taxes/charges and tradable permits, green funds, sustainable development trust funds and swaps, etc.

Learnings and Perspectives

- The financial commitments made at Rio must not be renegotiated. The efforts should be towards putting a definite timeframe and implementation strategy for further actions related to these commitments.

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- It must be stressed that sustainable development can be attained only through addressing the issue of poverty and livelihoods. Hence efforts should be made to revive the issue of finance for sustainable development as a priority issue of concern at the 2002 Summit. These efforts must go beyond financing environmental protection and must focus on initiatives that integrate economic, social, cultural and environmental development. Enhanced and predictable levels of funding in support of longer-term objectives of sustainable development need to be ensured. The ODA should be made predictable, transparent, untied and conducive to concerns of sustainable livelihoods. Donor countries should honour their commitment of achieving the ODA target of 0.7 per cent of their GDP as agreed upon by the United Nations.

- Developing nations need financial assistance in implementing best practices in sustainable development, especially in eradicating poverty. International support for sustainable development should not be linked to political developments like sanctions.

- The need for urgent reforms of the international monetary architecture, including restructuring the Bretton Woods twins and regional/multilateral financial agencies, especially their programmes and delivery mechanisms has been felt. The management/control of these institutions should primarily be entrusted to developing countries

- Preferred financial instruments are those that not only raise revenue, but also simultaneously change production and consumptions patterns in ways that promote sustainable development. To be effective, innovative mechanisms should be actively promoted, with the bulk of new resources coming from, and invested by, the private sector. Developing countries must be enabled to attract and benefit from private sector funds.

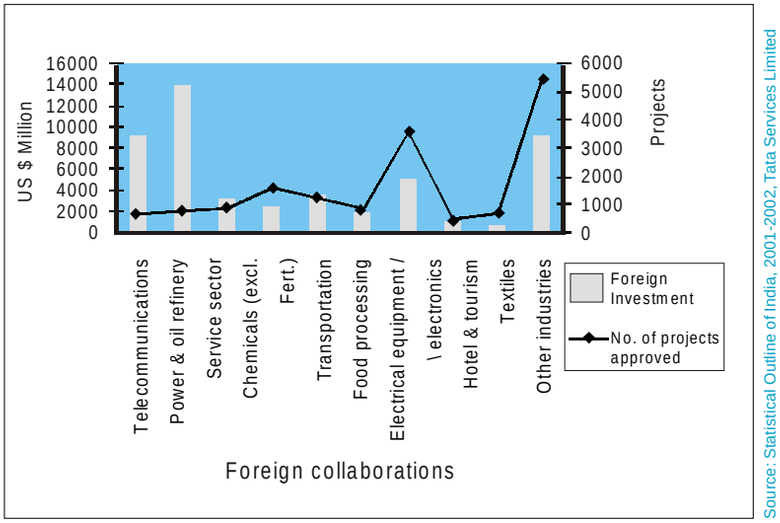
- The market must be actively engaged in a combination of incentive-based policies and targeted technical assistance efforts, based on the 'polluter pays principle' to simultaneously mobilise financial resources, stimulate technological transfer and innovation, and shift production and consumption toward more sustainable patterns.

- Considerable experience and ongoing experimentation with incentive-based financial mechanisms exist in industrialised and developing countries and economies in transition. There is an urgent need to compile and communicate this information more effectively, especially to policymakers and the public, and to enhance national capacities to identify, develop, and implement appropriate incentive-based policies.

- The taxation mechanisms should be re-examined and related to use of resources. Those who use more resources should have to pay more taxes.

- The establishment of a World Solidarity Fund for Poverty Eradication is suggested. More market access in the developed world for products from developing countries is needed. There is need to go a step further than poverty reduction. Attempts have to be made to reduce disparities.

- Appropriate mechanisms for technical assistance and preferential trade schemes for developing countries, as well as trade in organic produce need to be established.
- Mechanisms for trade in favour of developing countries and market access as a critical source of financing for sustainable development are needed.
- A civil society trust fund outside the domain of the government systems is needed, where civil society can directly contribute. This should be managed by civil society groups/networks and fund civil society initiatives towards technology transfer and sustainable livelihoods
- Proper royalty, based on valuation of resources, should be paid on transfer of the natural resources and raw material to the supplying countries.
- More investment is needed in cleaner production technologies, alternative energy technologies and for keeping these technologies in the public domain
- Measures can be taken to create self-help type financial mechanisms between the developing countries and the LDCs. They should come together and set up their own trust fund rather that expecting the developed nations to participate, contribute and then control the fund.



Source: Statistical Outline of India, 2001-2002, Tata Services Limited

- Developing countries can introduce domestic versions or equivalent of the Tobin tax, for allowing access to their markets.
- A process towards a Framework Convention on Corporate Accountability needs to be launched.
- International financing for sustainable development needs to be made more accessible at all levels, instead of being channelled only to a few institutions.
- Part of the taxes/levies from polluting industries must be channelled back for financing pollution control measures and relevant research.
- Allocation of a portion of ODA must be made to sustainable development education and to sustainable development initiatives of young peoples; and for integrating sustainable development into all education programmes.
- A multi-lateral framework for production and trade that includes the principles of the right of all countries to protect domestic markets, the precautionary principle, democratic participation, and a ban on all forms of dumping, needs to be created.
- Inspite of their success, initiatives like Joint Forest Management and

Watershed Development suffer from lack of financial outlay. Continued support for such initiatives is needed.

- External assistance should be taken only after consideration of its impact on environment.
- Along with energy and environmental audit, there is a need for monetary audit for the investment made in the context of sustainable development.
- Ecotourism is a potential source of financing for sustainable development, and hence it should be used as a strategy for financing biodiversity conservation efforts.
- Market and policy failures need to be corrected through internalization of environmental costs and phasing out of environmentally adverse subsidies.
- Institutional channels through which flow of resources–financial and technical– takes place, should be strengthened.
- There should be financial and technical support for basic research to help generate required data for decision making and capacity building in various sectors. Funding support needs to be made available for research in areas identified by developing countries.
- Mechanisms need to be worked out for refinancing local/national development banks to lend at concessional rates for sustainable development initiatives
- The CSD should continue to give high priority in promoting global and regional expert meetings on cross-sectional and sectoral financial issues of *Agenda 21*. In this context, the CSD should also continue to support the exchange of information on financial mechanisms among interested parties through meetings, publications, networking and the development of electronic databases. The CSD should make a special effort to involve in its activities, and to disseminate information to, representatives of the ministries of finance and other ministries concerned with economic management, in order to make them more receptive to the integrated view of resource mobilisation and policy reform to promote SD, that its Expert Group on Finance has developed in its five regional meetings since 1994.
- National and regional financial institutions should be encouraged to facilitate access to micro-credit or other micro-financing schemes and other economic opportunities for the poor and in support of small-scale and family businesses, taking into account experiences gained from already existing schemes.

3.2 Technology Transfer for Sustainable Development

As discussed at the Roundtable in Malaysia, "Technology transfer for sustainable development is usually focused on three issues: first, using limited public resources both to support research and development directly, and to leverage private sector investment in environmental technology;

second, encouraging the development and transfer of industrial process technologies that increase efficiency in input use and reduce the production of waste products (shifting the focus from end-of-pipe pollution control to pollution prevention); and third, developing new financial incentives to achieve these two goals. From the private sector perspective, the fundamental barriers to the development, transfer and commercialization of environmentally friendly technology include suppliers' perception of low rates of return and several types of market imperfections, such as: (a) the need for environmental technologies to be tailored for particular uses, making it difficult for potential buyers (particularly for small and medium enterprises) and suppliers to identify each other; (b) the need to ensure technology suppliers adequate returns without unduly restricting access to such technologies; and (c) limited public and private funding constraining development and dissemination of environmentally-sound technologies".

As mentioned in the UNCED Report, environmentally sound technologies protect the environment, are less polluting, use all resources in a more sustainable manner, recycle more of their wastes and products, and handle residual wastes in a more acceptable manner than the technologies for which they are substitutes. Environmentally sound technologies in the context of pollution are 'process and product technologies' that generate low or no waste, for the prevention of pollution. They also cover 'end of the pipe' technologies for treatment of pollution after it has been generated. Environmentally sound technologies are not just individual technologies, but total systems, which include know-how, procedures, goods and services, and equipment as well as organizational and managerial procedures. This implies that when discussing transfer of technologies, the human resource development and local capacity-building aspects of technology choices, including gender-relevant aspects, should also be addressed. Environmentally sound technologies should be compatible with nationally determined socio-economic, cultural and environmental priorities.

Learnings and Perspectives

- There is a need for favourable access to, and transfer of, environmentally sound technologies, in particular to developing countries, through supportive measures that promote technology cooperation. These should enable transfer of necessary technological know-how as well as building up of economic, technical, and managerial capabilities for the efficient use and further development of transferred technology. There has been little progress since the Rio Earth Summit in this vital area.

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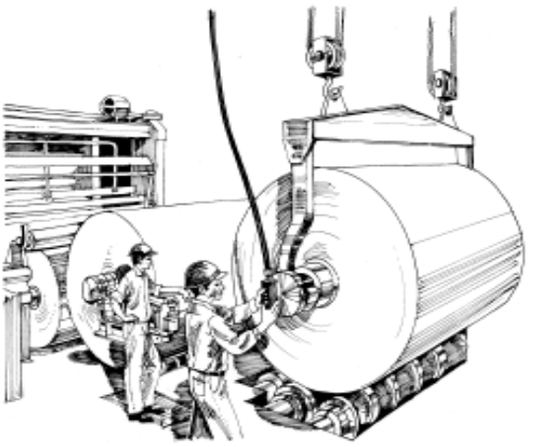
- Commercialization of technologies for agricultural production and environmental management should be restricted and brought under the public domain in order to increase (a) access to potentially beneficial technologies, and (b) public knowledge on their environmental impacts.
- International agencies, financial institutions, governments, the private sector, and NGOs should work together to seek the appropriate balance between ensuring adequate incentives and rewards for the development of environmentally-sound technologies on one hand, and ensuring wide access to such technologies on the other. This should include efforts to develop and implement technical assistance programmes that help users and suppliers of technology to identify each other, reduce pre-investment costs through technical, financial and legal assistance, and identify and support projects that demonstrate and disseminate environmentally sound technologies in specific sectors.
- A more radical and unconventional approach needs to be identified to address the balance between: (a) public and private sector technology generation, and (b) adequate compensation for private sector investments in environmentally sound technologies, and ensuring wide access to such technologies, especially in developing countries and small and medium enterprises.
- Private companies that are marketing new technologies in agriculture, such as genetic technology, should be required by governments to bear the costs of independent monitoring of their environmental impacts.



- Mechanisms for improved interaction and collaboration between universities, research institutions, and government agencies need to be strengthened.
- Provision of targeted financial instruments to facilitate acquisition of Environmentally Sound Technologies is needed. Appropriate and effective technology transfer mechanisms, including new credit lines for effective and expeditious transfer of environmentally sound technologies to developing countries need to be put in place.
- Access to biotechnologies, and protection of indigenous knowledge and intellectual property rights, need to be enhanced.
- Areas where technology transfer is required need to be identified. Appropriate mechanisms for public/private partnerships in these specific areas need to be created.
- Adequate support needs to be mobilized for capacity building in developing countries for intellectual property rights regimes.
- Cost-effective best practices in cleaner production in different sectors should be documented and disseminated through appropriate channels.

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- Development of certification and on workplace-based partnerships and programmes for sustainable development needs to be supported. Financial resources to improve productivity and competitiveness need to be mobilized.
- Patent laws need to be reviewed so as to bring sustainable development technologies into the public domain and to allow free access, or access on preferential terms, to these technologies to countries which need them most. These laws must give a higher priority to environment protection and should not stop transfer of technologies for the sake of protecting intellectual property rights.
- Education systems need to reflect the need for localized, specific technologies for sustainable development and should work to produce specialists in such technologies who have an interdisciplinary outlook.
- A global mechanism for continuously acquiring sustainable technologies and transferring them to developing countries on favourable/ concessional terms is needed. A suggested mechanism is a Global Sustainable Technology facility which acquires rights over use and redistribution of such technologies and then passes them on to the developing countries. Alternatively, proprietary technologies available through commercial channels may be purchased by the GEF and transferred freely to the developing countries for use and adaptation.

- There must be commitment on part of developed countries to transfer latest technologies which support sustainable development. Also, adequate safeguards should be developed and implemented to check dumping of obsolete technologies, machineries or wastes in developing countries. Unlike the developed world, where the need is for curative methods, developing countries need to invest more in preventive methods, specifically where they are not as polluted as the developed countries.
- Technologies for disaster mitigation and management should be identified and transferred to developing countries on subsidized terms. And this transfer should be inclusive of capacity building component for use of these technologies.
- The capacity of scientific and technological communities needs to be used to support governments and major groups in the adaptation of intellectual property concepts, and in improving information networks and infrastructure.
- Capacity in science and technology needs to be built through collaboration among research institutions, the private sector and governments.
- Eco-labeling of technologies, processes and products should be done.
- Traditional knowledge must be protected against exploitation.
- Global corporations need to develop corporate philosophy consistent with the priorities of the developing societies.

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- Wasteful subsidies in developed countries need to be curtailed, trade opportunities for developing countries improved, and incentives for environmentally damaging production systems in rich countries removed.
- There is an urgent need for updating our technologies in the sectors of clean fuels, CFC free coolants/refrigerants, pollution control, agricultural chemicals, industrial/occupational safety, hazardous substances management, etc.
- In these sectors, many industrialized countries have, in the past, exported outdated technologies to developing countries including India. These have caused deep-rooted environmental problems. These countries must support India technically and financially in developing clean-up strategies and in developing cleaner alternatives.

Some people talk of science and technology as if they were like forces of nature, like earthquake, let us say, about which nothing can be done except adjusting ourselves to it.

Jayaprakash Narayan

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4. Agriculture, Rural Development and Food Security

From a nation dependent on food imports to feed its population, India today is not only self-sufficient in grain production, but also has a substantial reserve. The progress made in agriculture during the last four decades has been one of the biggest success stories of independent India. Agriculture and allied activities constitute the single largest contributor (almost 33 per cent) to the Gross Domestic Product. About two-thirds of the work force in the country depends on agriculture as a means of livelihood.

Despite these impressive gains, India, at present, finds itself in the midst of a paradoxical situation: On the one hand there are record food grain stocks standing at an all-time high (62 million tonnes against an annual requirement of around 20 million tonnes for ensuring food security), and on the other hand, over 200 million of India's population is underfed, and millions are undernourished. The challenge is to bridge this gap.

In a scenario of shrinking land and depleting water resources, the challenge of the new millennium is to increase biological yields to feed the ever-growing population without destroying the ecological foundation. It is thus important–not to package this challenge as a demand or imposition of society on farmers, for which farmers would bear the cost, but as a necessity and methodology to also sustain their welfare and incomes.

India has the potential to meet these challenges. This potential can be realized through policy and infrastructure support from the government and by strengthening proactive synergies among the various sectors that play influential roles in the field of agriculture and rural development. The National Policy on Agriculture seeks to actualize the vast untapped growth potential of Indian agriculture, strengthen rural infrastructure to support faster agricultural development, promote value addition, accelerate the growth of agro-business, create employment in rural areas, secure a fair standard of living for the farmers and agricultural workers and their families, discourage migration to urban areas and face the challenges arising out of economic liberalization and globalization.

The following are suggestions towards achieving sustainable agriculture, rural development and food security. They provide a reference for actions to be undertaken by the various stakeholders in this area.

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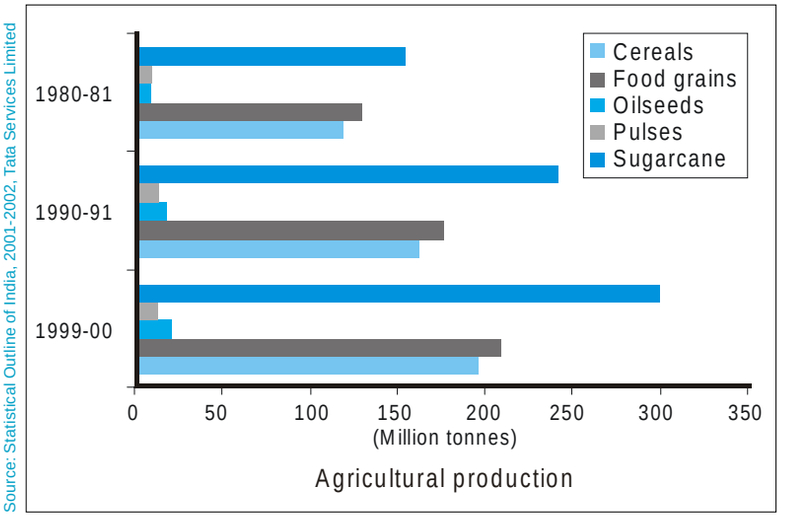
Learnings and Perspectives

4.1 Promote Sustainable Agriculture and Rural Development

Agriculture is directly linked to very many facets of sustainable development, including poverty eradication, sustainable consumption and production, management of natural resources, energy, freshwater, health, education, trade and market access, as well as technology transfer and capacity building. Agriculture is an integral part of the general development system, serving the system as a whole, and being served by it. If the effects of other sections of the development systems reduce sustainability, then sustainability of agriculture is also affected. A sustainable system should be resilient, and able to withstand shocks and failures of parts of its systems without the whole collapsing, and without small shocks leading to a spiral of unsustainability.



Agriculture centres on integrated use of natural resources such as soil, water, climate and biological diversity. The integration of agriculture with other aspects of land management and ecosystem conservation is essential in order to promote both environmental sustainability and agricultural production.

- Natural resources have to be accessible to the poor, which in the farm sector means secure rights to land, water and genetic resources. For this, there is a need to develop public-private partnerships.
- Policies for land and water resource management, biodiversity protection, infrastructure investment, strategy on institutional market reforms, reduction of tariffs and phasing out of possible commodity control are integral to achieving sustainable agriculture.
- Sustainability should be seen in the context of different agro-climatic zones as well of as the country as a whole. Suitable technologies should be developed and indicators for sustainable agriculture should be identified for both.
- It is essential to provide funding for integrated rural development plans, programmes and strategies, at national and regional levels, with particular emphasis on investment in economic and social infrastructure in rural areas, enterprise development, human resource development, and capacity building for local governance.

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- An efficient credit policy regime with the required rural banking and credit system will play a major role in the future. The government should encourage investment in vital agriculture infrastructure, credit linkages, and use of new and appropriate techniques towards this end.
- More than 70 per cent of the country's agriculture is under small and marginal farmers with limited resources. A nationwide crop insurance scheme will provide such farmers the needed confidence to invest and gain from technological advances in agriculture.
- The focus on accelerated food grains production on a sustainable basis and free trade in grains, as well as on rural employment opportunities will lead to faster economic growth and give purchasing power to the people, which in turn would help increase household food security.
- Concerted efforts should be made at national, regional and local levels to pool, distil and evaluate traditional practices, knowledge and wisdom and to harness them for sustainable agricultural growth.
- It should be recognized that information is a critical input for agricultural development. It is as important as other key inputs including credit, seeds, nutrients and water. Information can be efficiently converted into economically rewarding opportunities.
- It is critical to recognize that the challenge to world agriculture is both technological (requiring the development of new, high productivity, environmentally sustainable production systems), and political (requiring policies that do not discriminate against rural areas in general, and agriculture in particular).

4.2 Promote Equitable Distribution and Access

A positive right to life would imply that the State provides to each and every person, adequate food and other basic necessities, and that it ensures a healthy environment, so that people may live and grow in dignity. The most important challenge in the 1980s and 1990s was physical access to food. In this millennium, the challenge is economic and ecological access to food.

- A transition from chemical and machinery-intensive technologies to ecological farming technologies is required towards providing sustained physical access to food.
- Environmental access involves on the one hand, attention to soil health care, water harvesting and management, conservation of forests and biodiversity, and on the other hand to sanitation, environmental hygiene, primary health care and primary education.
- Emphasis on economic access underlines the need for promoting sustainable livelihoods through multiple income-earning opportunities.
- It is important to increase food availability in areas where it is produced, thus reducing transport costs and excessive dependence on international markets.

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- Shift from existing expensive, inefficient and ineffective institutional arrangements, to decentralized management systems of food storage and distribution will improve delivery, reduce handling and transport costs, and reduce corruption, thereby bringing down the issue price substantially.
- Procurement of grain can be decentralized through creation of food grain banks in each village/block of the district, from where people can get subsidized foodgrains (including locally grown coarse cereals) through food coupons.

4.3 Secure Food Security for All

Food security is a physical, environmental, economic and social issue. It involves not just production, but access; not just output but process; not just technology but policy; not just global balance but also national conditions; not just national figures but household realities; not just rural but urban consumption; and not just quantity of food but also quality.

- The concept of food security should be broadened to make it holistic so as to mean "every individual has the physical, economic and environmental access to a balanced diet that includes the necessary macro and micro nutrients and safe drinking water, sanitation, environmental hygiene, primary health care and education so as to lead a healthy and productive life."
- Issues of food security are part of a bigger whole. Sustainable land and water management must be seen as directly linked to food security. Population growth, environmental sustainability, poverty reduction, agricultural production, distribution, marketing, credit and many other factors also need to be recognized as part of this whole.

- The major challenge is to produce additional food while conserving depleting natural resources. It is also to provide physical, economic and ecological access to food and nutrition security at the household level.
- Food security must focus on a diversified food basket, not food grains alone. Broad-based food security systems are not dependent on two-three species but on over 100 species that are underutilized. This will also prevent locally adapted grains from becoming extinct.
- Nutrition security must be given integrated attention by emphasizing horticulture, animal husbandry, fishery, millets, pulses and several other resources for which India is traditionally known. There is need for investment in science and technology that will promote diversification.
- Food security must not be based on market, but rather on self-reliance

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and sufficiency. The approach should be one of moving from food security to food sovereignty.

- The elimination of hunger and malnutrition is not just a food problem. It is linked to poverty and population growth. Rising food output is essential but so are the slowing of population growth and maintaining the ecological balance.
- Food banks at grass root levels should be well maintained.

"What we need is food sovereignty. We reject food security based on the market. Rather, it should be based on self-reliance and sufficiency."

Vinod Raina
Multi-stakeholder Consultation

4.4 Strengthen Extension and Capacity Building Mechanisms

In the 21st century, it is increasingly necessary, and increasingly feasible to take a whole systems approach to organized, positive change in rural places. For extension, that means helping farming people toward sustainably increasing productivity–particularly in the small-mixed farming systems in rain-fed areas, in upland areas, and in other places which have been neglected. It also demands measuring success in terms of the consumption of rural people, as well as of their production. And that, in turn, will require agricultural extension systems which help farm men and women organize themselves in ways which empower them–to lead agricultural extension and to exert enough power and influence over agricultural research systems so that they generate useful, practical information which fits the needs and interests of those farming people.

- Agricultural extension must focus on increasing production and productivity of food and fiber in an economically and environmentally sustainable way. It must be done in a way which does not destroy rural livelihoods and rural communities.
- Extension activities should promote more comprehensive rural education and extension programmes directed particularly at rural poor, with major emphasis on efforts to reduce illiteracy, particularly among women and girls.
- It is important to organize education, extension and information, and skill empowerment on the basis of intensification, diversification and value addition of farming systems.
- Partnerships aimed at strengthening the knowledge base, and improving the dissemination of information, such as farm-to-farm technical assistance programmes, can help strengthen agri-extension. Public-private partnerships could be envisaged in basic sustainable agricultural techniques.
- Sustainable agriculture demonstration plots should be set up in research stations, demonstration centres, seed production centers, farmers' training centres etc., of government, cooperative and non-government agencies.
- The system should support a new agricultural extension system that could meet the needs of information-hungry farmers, especially educated youth and women engaged in farming, and would empower them with new techniques and skills that foster sustainable agriculture.

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4.5 Promote Awareness and Education Activities

National policies and planning should recognize that public awareness can play an important role in establishing a firm basis for sustainable agricultural resource conservation and use. Public awareness should be considered in the development of all national programme activities.

- National strategies should identify objectives and strategies for public awareness, define target audiences, partners and tools for public outreach.
- Governments should recognize and encourage the work of NGOs in raising public awareness.
- Short-term and long-term courses specializing in sustainable agriculture should be run in agricultural universities. A separate curriculum for this subject should be developed for the regular graduate and postgraduate courses also.
- There is generally public apprehension about the possible consequences of agricultural biotechnology. It is important to organize public information programmes and public discussions that would help share relevant work of agricultural and biological scientists with the public.

4.6 Ensure Appropriate Application of Research, Science and Technology

Scientific and technological development is not enough in itself. It is critical to make sure that sustainability and poverty reduction remain the guiding principles, and that we use our resources, harness our intellect, and direct our knowledge to benefit the poor, the hungry and the marginalized.

- The impact of agricultural research is decisive. Such research should, wherever possible, be coupled with on-farm activities in order that the context and purpose of the work are fully appreciated. Research should assist in the monitoring, evaluation, and improvement of on-farm efforts.
- Research should be undertaken in a participatory and collaborative manner to foster interaction and cooperation between rural people and research institutions. Other institutions must be involved appropriately whenever necessary.
- A comprehensive area-specific database of natural resources should be developed and made available for agriculture planning, implementation, research and extension. Existing data and information should be assembled, verified, and put in a usable and easily accessible form.
- Well-designed information technology packages should be developed, that could help serve as a market information network; weather, pest and disease

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monitoring system; and could be a storehouse of various current farming technologies and practices.

- Modern information technology should be used to reach the unreached. Educated youth must be attracted to and retained in farming through spreading science-based precision farming techniques, which are intellectually stimulating and economically rewarding.

- Training and capacity building should be undertaken in areas such as taxonomy, population biology, ethnobotany, and eco-regional and agro-ecological surveying. Specific research priorities need to be determined separately for each region.

- Additional research is necessary to develop drought tolerant, pest and disease-resistant crops, biological pest management, nitrogen fixation, more effective use of locally available organic materials, inter-cropping systems, and perennial crops, including agroforestry.

- Farming systems need to be designed so as to achieve the triple goals of more food, more income and more livelihoods per hectare of land. For this, it would be fruitful to harness the tools of eco-technologies resulting from a blend of traditional knowledge with frontier technologies. Such tools include biotechnology, information and communication technology, GIS mapping, space technology, renewable energy technologies (solar, wind, biomass, biogas), and management and marketing technologies.

- The revolution in biotechnology has both promises and problems. Biotechnology should be judiciously used so as to support the mission of environmental protection, poverty reduction and food security. But the adoption of every new technology must be accompanied by a precautionary package. In the case of biotechnology, biosafety and biosurviellance must be considered as important factors.

- Food should originate from efficient and environmentally benign production technologies that conserve and enhance the natural resource base of crop and animal husbandry, forestry, inland and marine fisheries.

"Women employment and income generation must be given focus to solve the problem of household food security. Involvement of farmers in technological development will help in increasing food production."

S. Bisaliah
Multi-stakeholder Consultation

4.7 Recognizing the Value of Agricultural Biodiversity

While a small number of species provides a large proportion of global food needs, hundreds of other species are utilized at a local level, either through cultivation or harvesting. These under-utilized species contribute substantially to household food and livelihood security. They are often managed or harvested by women. Knowledge concerning the uses and management of these species is likewise often localized and specialized. Many under-utilized plants have potential for more widespread use, and their promotion could contribute to food security, agricultural diversification, and income generation, particularly in areas where the cultivation of major crops is economically marginal.

- It is vital to recognize the intrinsic value of biological diversity and of its ecological, social, economic, scientific, educational, cultural, and aesthetic

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importance. This diversity is being lost in the fields and other ecosystems of virtually all countries.

- High priority needs to be given to safeguarding as much existing unique and valuable diversity as possible in *ex-situ* collections of plant genetic resources for food and agriculture, and also through *in-situ* conservation in their natural habitats.
- Goal-oriented, economically efficient and sustainable system of *in-situ* and *ex-situ* conservation needs to be developed.
- Cooperation among national programmes and international institutions to sustain *in-situ* and *ex-situ* conservation efforts needs to be developed and strengthened. It must be recognized that states have sovereign rights over their own plant and animal genetic resources for food and agriculture.
- A time-bound programme to list, catalogue and classify the country's vast agro-biodiversity with special focus on conserving indigenous breeds and species, must be initiated.
- Agriculture diversity registers should be formed for local and regional varieties. Agriculture policies should be formulated based on these registers.

4.8 Relook at Agriculture and Related Policies

It is critical to develop and strengthen appropriate policies and legislative measures to create an enabling environment for sustainable agriculture and rural development. Such an environment would promote access by the poor to land, water resources and other agricultural inputs; land tenure modifications that recognize and protect indigenous and common property resource management systems, and also build local capacities for better management of natural resources.

- Governments should consider, and as appropriate, adopt policies in extension, training, pricing, input distribution, infrastructure development, credit and taxation, which serve as incentives for crop diversification and the creation of markets for biodiverse food crops, including standards for labeling of foods, which allow the highlighting of use of non-standard crop varieties.
- Policies should stress on land reforms, input and output pricing, investments in irrigation, infrastructure and insurance, legislation for biodiversity, geographic appellation, varietal protection and farmers' rights.
- Well-defined and enforceable land rights, legal security of tenure and equal access to land, water and other natural and biological resources, need to be assured, in particular for indigenous communities, women and disadvantaged people living in poverty.
- It must be recognized that states have sovereign rights over their plant genetic resources for food and agriculture, while also confirming our common and individual responsibilities in respect of these resources.
- Coordination is needed to provide national programmes with information on these issues and to assess the impact of international developments in

these fields on the conservation and exchange of plant genetic resources, and to incorporate new research developments, as appropriate, into national systems and practices.

- Effective regulatory mechanisms and safeguards need to be universally installed so that the impacts of biotechnologies are both productive and benign.
- Development of agro-ecology-relevant technologies based on an understanding of local agriculture and resource management practices need to be supported and promoted.
- Chemicals and pesticides banned in developed countries should not be dumped into developing countries in the name of liberalization, globalization and industrialization.
- When patenting a variety or item of research, the area of origin should get due credit and benefit of the patent.
- Before releasing a new variety, including genetically modified varieties in the market, the following parameters should be considered for a variety of agro-climatic zones: Impact on soil productivity; hazardous residual effect; health hazards; adverse effects on other crops; adverse effects on other agricultural practices; threat to the indigenous varieties; impact on other professions; and impact on flora and fauna.

4.9 Create Favourable Economic Climate

Agriculture has become a relatively unrewarding profession due to generally unfavourable price regimes and low value addition, causing abandoning of farming and increasing migration from rural areas. The situation is likely to be exacerbated further in the wake of integration of agricultural trade into the global system, unless immediate corrective measures are taken. A favourable economic environment and supportive public management system are the key pillars for the promotion of sustainable agriculture.

Agriculture must help produce not only more food, but also more income and livelihood opportunities.

M S Swaminathan

- Capital inadequacy, lack of infrastructural support and demand side constraints such as controls on movement, storage and sale of agricultural products, etc. affect the economic viability of agriculture sector. These issues need urgent attention.
- Increasing capital formation and farmer's own investments by removal of distortions in the incentive regime for agriculture, improving the terms of trade with manufacturing sectors and bringing about external and domestic market reforms, backed by rationalization of domestic tax structure, will help to create a favourable economic environment for agriculture.
- Agriculture-dependent countries like India should have a certain degree of autonomy and flexibility in determining the domestic agricultural policies so as to improve productivity, enhance income levels, reduce vulnerability to market fluctuations, ensuring stability of prices, etc.
- Creating a level playing field in the global marketplace will provide the

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necessary incentives and leeway for farmers, especially the small ones to adopt environmentally friendly farming practices, and help in avoiding, their desperate acts of survival at the expense of sustainable development, due to distortions in international trade.

- In the context of globalization of the food market, farmers in developing countries need to improve access to their own local markets. A 'market-plus' rather than a pure market approach for the agricultural sector would be effective in addressing the wide range of issues associated with production, pricing, food distribution and access.
- At international forums, developing countries like India should have the necessary flexibility to pursue legitimate non-trade concerns with regard to international markets. Such countries should seek reforms in global agricultural policies relating to price, subsidies, trade and technology transfer, and respect for IPRs of local communities.
- International agreements should allow room for the domestic agricultural sector to meet challenges of maintaining the livelihood of the large agriculture-dependent population, and production of sufficient food to meet domestic needs.

- Agricultural food processing industries with international health standards should be promoted locally.
- Biomass based entrepreneurship should be promoted to generate wealth at the rural level.
- Civil society groups should use benchmarks and sustainability indicators to monitor performance of food processors, retailers and food service companies, especially regarding fair terms of trade.

4.10 Ensure Participation at All Levels, and Protection of Rights

National programmes are increasingly confronted with policy, legal and institutional issues related to ownership, intellectual property rights, exchange, transfer and trade in agricultural resources. Participatory processes and involvement of various stakeholders can help find answers to such concerns. Towards this it is crucial to develop a framework for a unified national programme to enhance the diverse efforts within the country to tackle such issues.

- Programmes and policies for food and agriculture activities should involve public and private institutions and companies, non-governmental organizations, communities and individuals from the agriculture, environment and development sectors.
- The role of indigenous and local communities in conserving, collecting, improving and sustainably using plant genetic resources for food and

agriculture must be acknowledged. Local, community-level initiatives and participation in proposing programmes need to be encouraged.

- Gender concerns in agriculture need to be mainstreamed. Appropriate structural, functional and institutional measures to empower women and build their capabilities and improve their access to inputs, technologies and other farming resources need to be strengthened.
- The need for equitable sharing of benefits arising from the use of traditional knowledge, innovations and practices relevant to the use and conservation of plant genetic resources for food and agriculture must be recognized.
- Nutrition security must be placed high on the agenda for development plans and programmes at all levels–village, block, district and state. Institutions that will design and monitor locality-specific interventions must be developed.

Bearer of all things, hoard of treasures rare, sustaining Mother Earth, the golden breasted...Impart to us those vitalizing forces that come O Earth, from deep within your body. Whatever I dig up of you, O Earth may you of that quick replenishment.

Atharva Veda

5. Water

5.1 Fresh Water

In Indian tradition, water is not a commodity, it is life-giving source. Traditionally, its use and management were governed by codes of conduct and traditional systems. Today these are being eroded. Water is a prime natural resource, a basic human need and a precious asset of the people. If the world's rainfall were averaged over its landmass, India would receive more than one-and-a-half times the rain that other parts of the world get. But rainfall in India has a wide spatial and temporal variation, and is highly seasonal. Eighty per cent of the country gets 80 per cent or more of the annual rainfall during the four months of the monsoon. Managing water so that it is available when and where it is required is a major issue.

Keeping in view the constraints of water availability and the variety of uses, the National Water Policy (1987) states that, planning and development of water resources needs to be governed by national perspectives. Thus water allocation is one of the important issues to be addressed. Special attention is to be given for equitable access of water, with emphasis on marginalized and weaker sections of the society. As also stated in the Water Policy, special efforts should be made to investigate and formulate projects either in, or for the benefit of, areas inhabited by tribal or other specially disadvantaged groups such as Scheduled Castes and Scheduled Tribes. This would require establishment of a better developed water infrastructure and improved water management.

Efficient water management and service provision for all would need increased participation, and decision-making at the lowest level. The decision-making process should be transparent to prevent corrupt practices which hamper the benefits from reaching the right place. Floods and drought affect vast areas of the country, transcending state boundaries. A third of the country is drought-prone. Floods affect an average area of around 9 million hectares per year. According to the National Commission on Floods, the area susceptible to floods is around 40 million hectares. The approach to the management of drought and floods needs also to be coordinated and guided at the national level. Proper planning needs accurate data and information. The National Water Policy states that a standardized national information system should be established with a network of data banks and data bases, integrating and strengthening the existing Central and State level agencies and improving the quality of data and the processing capabilities. There should be free exchange of data among the various agencies and duplication in data collection should be avoided.

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Learnings and Perspectives

5.1.1 Appropriate Water Allocation Among Competing Needs and Demands

Water is a common resource. Everyone has a right to water.

- Water should be equitably and sustainably allocated, firstly to basic human needs–including livelihood needs–and then to the functioning of ecosystems and different economic uses including food security. Allocation mechanisms should balance competing demands and take into account the social, economic and environmental values of water. They should reflect the links between surface and groundwater and those between inland and coastal water, growing urbanization, land management, the need to maintain ecosystem integrity and the threats of desertification and environmental degradation. They should have incentives for conservation efforts made by users.

- Allocations must be made on the basis of good quality, current data regarding water availability.
- The effort must be to empower communities in general, and their traditionally deprived sections in particular, to decide water allocations.
- There must be systems for monitoring the use of allocated water.
- Integrated water resources management should be sustainable and should optimize water security and human benefit per unit of water, while protecting the integrity of ecosystems. Water should be treated as a valuable and finite resource. Water demand should be more actively managed, and water use efficiency increased in all sectors. Mechanisms to do this should be identified. Wastewater should be viewed as a resource.
- Irrigated agriculture is the world's largest user of water, and therefore offers the largest potential in terms of water savings, the benefits of which can be shared with other sectors. In order to realize this potential, there should be proper incentives for economical use of water and for the adoption of conservation technologies. Capacity building of farmers for adopting these measures and technologies is also essential.
- The value of ecosystems should be recognized in water allocation and river basin management. Allocations should, at a minimum, ensure flows through ecosystems at levels that maintain their existence and integrity and ensure the rights of riparian communities.
- There needs to be a plan for the conservation/protection of all rivers, especially the Himalayan rivers, taking into account all the uses.

5.1.2 Combat Corruption Effectively

- The fight against corruption must start with awareness building and should aim at maximizing transparency to the public in the entire decision-making process of a project, from planning through procurement to construction and operation. No party to any corrupt practice can have immunity to the consequences.
- Water governance arrangements should improve accountability, introduce and enforce appropriate legal provisions against corruption, take timely, exemplary and preventive action against corruption, monitor the performance of public institutions, donors and private companies, develop codes of conduct, and invite civil society to play an active role in these processes.
- Judicial systems and capacities to enforce these arrangements must be put in place.
- Assured access for citizens to all relevant information in the public domain is a powerful tool for fighting corruption. The public should also have access to effective and affordable justice. All actions, whether initiated by International Financial Institutions, countries or others, to fight corruption, should be welcomed.

5.1.3 Data Availability

- There is a need for qualitative and quantitative data on water. Generating a water database needs high technical capacity and technology. It has to be generated by government organizations and they must give access to the data to the public and NGOs.

5.1.4 Encourage More Efficient Service Provision

- The predominantly public delivery of water and sanitation services should be complemented by greater use of different and often innovative forms of service delivery, including self-help groups formed by the people themselves, informal service providers, co-operative societies, and local and international private enterprises. In each situation, the approach should be chosen that would best benefit people and the environment.
- All service providers should be subject to effective regulation, benchmarking and monitoring. They should be efficient, accountable, and protected from inappropriate pressures. There should be clear separation between the roles and responsibilities of the regulator and the service providers.
- Regulation is a national level function which should be strengthened through international networking and the application of consistent principles, standards and methods.
- Developing countries must have access to latest technologies which facilitate efficient service provision, and to financial support for these. Local R&D for commercially viable technologies to conserve and augment water supply need to be explored and supported.

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5.1.5 Ensure Appropriate Water and Sanitation Infrastructure and Services

- Water is an integral part of sustainable development. Policies regarding all aspects of water should be clearly linked to policies for poverty reduction and economic growth. Governments should review the priority given to water and sanitation, and to productive water infrastructure in national and international programmes to tackle poverty. Key measurable indicators must be identified and monitored in this regard.

- Water and sanitation infrastructure and services should be pro-poor and gender-sensitive. The plans for these should be realistic and targeted to the needs of the poor, and should include targets and indicators of progress at all levels.

- The UN Millennium Declaration target on drinking water should be complemented by a corresponding target to halve the proportion of people lacking access to improved sanitation by 2015.

Population having drinking water and sanitation facilities (%)

	1985	1990	1999
Drinking water supply			
Rural	56.3	73.9	98.0*
Urban	72.9	83.8	90.2^
Sanitation facilities			
Rural	0.7	2.4	9.0*
Urban	28.4	45.9	49.3^

*With Government initiative only under CRSP, MNP, JRJ, and IAY, coverage through private initiative is not known
^As on 31-3-1997
Note: Percentage coverage in respect of rural water supply and sanitation are based on population covered in current years to corresponding 1991 census population
Percentage coverage in respect of urban water supply and sanitation are based on population covered in current years to corresponding current population

Source: Ministry of Finance (2001)

5.1.6 Equitable Access For All

- Public responsibility includes the task to setup and enforce stable and transparent rules that enable all water users to gain equitable access to, and make use of, water. Special efforts need to be made with regard to access for socially disadvantaged groups and women, as well as in water-stressed areas, such as, arid areas, coastal areas, etc.

- By 2003, a framework for a water resources management plan, as well as a model plan (with alternatives), should be developed. By 2005, all states should have developed and adopted their plans.

- The primary responsibility for ensuring equitable and sustainable water resources management rests with governments. It requires the participation of all stakeholders who use or protect water resources and their ecosystems. Special attention is needed to improve the participation of those people, particularly the poor, socially disadvantaged and women, who are often excluded from decision making. Knowledge of rights of the stakeholders is a precondition to equitable access. This needs to be facilitated.

- Institutional framework and mechanisms need to be in place, at national, state, and local levels, to ensure effective participation.

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5.1.7 Improve Water Management

- The close link between forests and water, and the traditional relationship between agriculture and water, need to be recognized and protected to ensure sustained productivity.
- National water management policies should take account of the impact of trade in water-intensive goods on water availability and ecosystems integrity. For example, in water-scarce regions, people should grow crops with low water requirements, or of high value compared to the water used. Options for improving the water balance by importing water intensive goods from water-rich regions should be explored, where appropriate and cost-effective.
- The potential of rainwater harvesting for augmenting rural and urban water supply is increasingly becoming recognized. This alternative should be further explored and utilized.
- Proper water pricing must be an integral part of water policies. However, care must be taken to ensure that the poor and socially disadvantaged are not denied access. Moreover, there must be adequate monitoring and control of market mechanisms.
- It is necessary to study and analyze the impacts of subsidies (on water, energy, and other relevant inputs) on water use. Subsidies that inhibit water-use efficiency or cause negative effects on the environment should be reduced.
- Our traditional water management approaches and systems were both sustainable and accountable. These need to revived and invigorated. Policies must recognize and build on these.
- Principles of reuse and recycling of water resources must be incorporated into water management plans and strategies. There must be incentives for water conservation.

5.1.8 Manage Risks to Handle Variability and Climate Change

- Water management arrangements should take account of climate variability and expand the capacity to identify trends, manage risks and adapt to hazards such as floods and droughts. Anticipation and prevention are more effective and less expensive than having to react to emergencies. Early warning systems should become an integral part of water resources development and planning. Communities must be capacity-built to help them anticipate, prepare for, and cope with disasters.
- Closer links should be established between development and disaster management systems. Development plans in vulnerable areas should factor in disasters and their impacts. This should be achieved both by reducing poor people's vulnerability to disasters and by strengthening post-disaster recovery systems. There is need to build in comprehensive security of vulnerable communities, including security of food, water, shelter and livelihood.

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- Decision-making mechanisms under uncertainty should ensure flexibility to respond to both rapid-onset disasters and long-term changes in water resources. Risk management should be an integral part of water resources management. This should include establishing close co-ordination beyond the water sector.
- Exposure to flood risk should be minimized through wetland and watershed restoration, better land use planning and improved drainage. The impacts of climate change on the Himalayan snows and the consequent water flows are a real threat today. Measures must be taken to minimize the risks and manage the consequences.
- Particular attention needs to be paid to the poor in both rural and urban areas who are typically resident on land vulnerable to disasters, those whose livelihoods are particularly vulnerable to their impacts, and who are often the victims of disasters.
- Organizations that deal with disaster preparedness, management, and creation of awareness about disasters, should be strengthened. Such action will also place societies in a better position to deal with future climate change.
- Developed countries should help by sharing appropriate disaster management technologies and information, along with capacity-building of the disaster management crew.
- Regional co-operation in disaster preparedness and management should be supported.

5.1.9 Manage Water at Lowest Appropriate Levels

- People need to be closely involved in management and governance decisions concerning water resources. Local stakeholders should develop mechanisms for collaborative management of local water needs and resources. The design and operation of water services should use a people-centred approach and be based on understanding the needs of the people to be served.
- Decision-making, implementation of projects, and operation of services should be decentralized to the lowest level capable of handling such tasks, keeping in mind that watersheds are the appropriate frame of reference for water resources management. Local governments, community-based organizations and private service providers (where they exist) should be the key players in local management and the provision of local services. This requires appropriate legislation, financial mechanisms and capacity building to empower local governments and other stakeholders, and to facilitate the role of small-scale service providers.
- National governments should strengthen their domestic public funding capabilities and create a viable financial frame for local governments. This will require significant support to modernize the financial planning, management and accounting skills in local governments.
- Decentralization of responsibilities for water and other services to local

"The need for integrated water resource management and decentralization of decision making to the lowest level are paramount."

Ashoke Chatterjee
Multi-stakeholder Consultation

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government should go hand in hand with parallel actions to improve management and provide clear authority to raise and retain revenues.

5.1.10 Promote Gender Equity

- Policies and systems related to water and sanitation need to reviewed for gender sensitivity.
- Water management policies and mechanisms should not distinguish between water users by gender and should ensure equitable access of women to water resources, including safe drinking water and sanitation.
- Water resources management should be based on a participatory approach. Men and women should be equally involved in sustainably managing the use of water resources and sharing of benefits. To achieve equity, in many parts of the world, the role of women in water management needs to be strengthened and their participation broadened.
- Water and sanitation experts and policy makers, and those involved in the implementation of these programmes, e.g., Panchayati Raj institutions, should be trained to work in a gender-inclusive manner. In many places, specific support is also needed to empower women to take up leadership and managerial roles in water resources policies and management.
- Water policies and water management systems should be gender-sensitive. They should reflect the division of roles and labour–paid and unpaid–between men and women in all settings related to water. Data relating to water should be disaggregated by gender, where relevant.
- There must be provision for specific support to improve access of women and girls to sanitation, including in schools.

5.1.11 Promote Participatory Benefit Sharing

- In many water-scarce countries, the development of new water sources and infrastructure may be necessary to provide water for development and to mitigate the impacts of desertification, droughts and climate change.
- Where possible small projects should be preferred. Decisions to develop large water infrastructure projects including construction of dams should be taken after a participatory integrated assessment of needs and options, taking a precautionary approach into account. All risks, costs and benefits should be fully accounted for. Actions to improve the performance of existing infrastructure should be a high priority. The role of large infrastructure in sustainable development and poverty reduction should be directly demonstrated.
- Project designs should minimize potential negative impacts on the environment, enhance the livelihoods of project-affected parties, and create alternative livelihoods where necessary. People affected by a project should participate in project decision-making and share in project benefits. Proper mechanisms and incentives should be in place for compliance with rules and agreements concerning environmental and social aspects of projects.

5.1.12 Protect Water Quality and Ecosystems

- Drinking water quality should be safeguarded because it is essential for human health.
- Water governance arrangements should protect ecosystems and preserve or restore the ecological integrity of groundwater, rivers, lakes, wetlands and associated coastal zones. This will help to maintain the wide range of ecological services that healthy ecosystems provide, and the livelihoods that depend upon them.
- Water resources management should complement programmes to combat desertification and other forms of environmental and ecological degradation.
- Pollution prevention should be prioritized, because it is normally more cost effective than the restoration of polluted waters. Water supplies should be protected from pollution right from the source to the user.
- Treatment of waste water must be intensified and made more affordable for municipalities and industry. Investments in appropriate sanitation facilities should protect water bodies from pollution and reduce health hazards. Countries should intensify their attention to the management of diffuse (non-point) sources of pollution, including agricultural run-offs.
- Effective legal frameworks for protecting water quality should employ the full range of policy instruments including regulation, voluntary measures, market and information-based tools. Where such frameworks exist, water quality should be monitored and the regulations enforced. This approach should make use of the 'polluter pays' principle, thus giving incentives to polluters to apply the best available technology to prevent pollution.
- Water laws should be reviewed and strengthened, with respect to the quality aspects. Citizen participation in enforcing these laws should be encouraged, as also monitoring of water quality by communities, students, etc.

5.1.13 Share Benefits

- Watersheds, river basins, lakes and aquifers must be the primary frame of reference for water resources management. Institutional and participatory mechanisms need to be developed at this level. Inter-basin transfers may be considered where feasible, with adequate environmental safeguards.
- Water can promote regional co-operation. Such co-operation across internal and international boundaries should be intensified as a means to share the upstream and downstream benefits. Sharing of traditions, experiences and learnings among developing countries must be facilitated.
- Co-operative management of such water is best served by long-term commitments. Active strategies, plans and mechanisms should be worked out to exchange water-related knowledge and develop mutual understanding.

5.2 Marine Resources

The protection of the oceans, seas and coastal areas, including their living resources, requires a multi-sectoral, but integrated approach, that addresses

all dimensions of ocean-related issues. The various elements include the management and sustainable development of coastal areas, the protection of the marine environment, the sustainable use and conservation of marine living resources in both the high seas and areas under national jurisdiction, and research on critical uncertainties, including climate change.

Learnings and Perspectives

5.2.1 Managing Marine and Coastal Areas

Coastal areas must be recognized as complex, diverse and fragile ecosystems, and not simply as areas geographically located besides the world's oceans. Coastal zones and marine areas are under constant threat from maritime disasters—oil spills and leaks, pollution from sea-going vessels, pollution from installations and facilities used for exploitation of natural resources at sea, and dumping of untreated wastes in the oceans.

- The landward and seaward sides should be viewed as a single unit of the coastal zone and must be considered as part of an integrated whole, for its proper management, taking into account present and future population pressures. The coastal zone should be considered as a unit for the purposes of strategic planing.
- Sedimentation needs to be prevented, especially in the coastal wetland areas, such as lagoons and mangroves, as this could affect productivity of the oceans.
- Preservation of genetic diversity by *ex-situ* and *in-situ* methods should be undertaken. For marine flora and fauna, *ex-situ* conservation is not a very feasible option because of the large variety of species. *In-situ* conservation through maintaining resources in their native wild state by protecting the habitat appears to be a more practical approach. Captive breeding of endangered fauna and flora could be initiated where possible and necessary .
- It is important to understand the critical link between the stability and sustainability of marine resources and coastal ecosystems, and the stability and sustainability of social systems. Social and environmental costs should be considered at the initial planning stage of all projects.
- Global mechanisms and agreements for the monitoring and reduction of pollution from shipping and offshore industries could be strengthened by encouraging the development of an international code of conduct for shipping, and of internationally accepted environmental principles for offshore industries; increasing the understanding of the impact of oil spills and the need for risk reduction strategies; and promoting the identification of areas that are particularly at risk from shipping.
- The sea must not be seen as a convenient place where anything which is environmentally less acceptable on land, could be dumped. It is critical to prevent the discharge of untreated effluents from industry, domestic wastes,

and also vessel-based pollution, such as ballast water discharge, harmful anti-foulants, ship recycling and dumping of wastes at sea.

5.2.2 Equitable Access to Marine Resources

Communities' rights to livelihoods should be taken care of in any development plan. Commercial rights of developers should not result in generating huge profits for relatively few people at the expense of the many who are left with a degraded and polluted environment. The equity and sustainability factors in management of marine and coastal resources thus become critical.

- An integrated programme is necessary to ensure that the ecological security of the coastal zone and the livelihood security of coastal communities are not only protected, but also become mutually reinforcing. The conservation strategy must be people-centered, so that the local population develops an economic stake in conservation.
- There is need for a comprehensive deep sea fishing regulation, keeping both the traditional and deep-sea fishing industry in view.
- Means by which marine resources can be sustainably used to support local industry must be explored.

5.2.3 Participatory Management of Marine and Coastal Resources

Coasts and coastal people must be recognized as an integral part of marine and coastal resources. Coastal area management must recognize the multi-dimensional aspects and recognize the importance of human, ecological and economic factors in the formulation and implementation of management policies. The role of stakeholders must be recognized as crucial for sustainable management.

- The importance of the role of local communities of the coastal zone practicing different occupations like fishing, agriculture, arts and crafts, etc. in sustainable maintenance of the area and stake in the resources of the area must be understood.
- Public information and participation in decision-making must be promoted as prerequisite conditions for new development projects. Research reports must be made available to the public, especially local communities.
- A stakeholder approach in fisheries management must be adopted taking into account both equity and sustainability factors. All those who have a stake should be part of this process, consulted and involved in management and operation.
- Sustainable mechanisms must be established to overcome social, environmental and economical issues in an integrated fashion.

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5.2.4 Sustaining the Use of Resources

With shrinking diversity of habitats and eroding genetic diversity of wild populations, it is becoming increasingly difficult to increase and sustain world fisheries to meet the growing demands.

- A specific harvesting location should not be exploited year after year, but should be rested periodically for the species to stabilize in that area before being harvested again.
- Corporate responsibility must be demonstrated in adopting proactive sustainable fisheries benchmarking strategies thereby encouraging the stakeholders and others to follow.

"We do not have micro plans for our fishing villages. Small fishing communities have to be the focus of our policies."

Nandakumar Kamat
Multi-stakeholder Consultation

5.2.5 Development of Infrastructure

- Modern technologies for storage, processing and marketing of marine resources, especially fish must be developed. Infrastructure like roads from fish landing centres to major marketing centres

5.2.6 Information, Research and Development

To prevent duplication of activities leading to wastage of resources, Research and Development (R&D) needs to be focused to suit Indian conditions. Periodic and comprehensive studies need to be carried out to quantify the available resources over space and time as the ocean environment is dynamic. There need to be mechanisms to ensure exchange of data between various departments of the government, research and academic institutions, etc. and also establish networks among them.

- Studies to develop a base-line data for better understanding of existing and emerging situations need to be undertaken. An inventory of marine (ocean and coast) biodiversity needs to be developed and updated systematic.
- Research for reducing and reversing sea water intrusion into ground water, desalination of ocean water by using renewable energy sources such as wind, wave and solar technologies, for exploration and exploitation of living and non-living resources and energy from the oceans, needs to be undertaken. As far as possible, these technologies should be indigenously developed so as to make them socio-economically relevant. Solutions must use research findings as well as the traditional wisdom of local communities.
- There is need to develop new resources through sea ranching and marine culture in enclosed and semi-enclosed water bodies. The net harvestable potential needs to be increased by increasing biomass and the fish stock through modern technologies.
- Traditional sustainable modes of harnessing marine resources.
- Networks of institutions need to take up integrated and interdisciplinary ocean research. R&D should not only aim towards technology development, but also for tackling socio-economic problems. Findings of research need to be widely disseminated.

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- An agency to bring out standard maps of coastal zones, including EEZ, topography, resources, database on global maritime regulations, etc. must be established. This agency would also need to conduct periodic comprehensive surveys to quantify the available resources over space and time. A national registry of accidents which are taking place in the oceans and in the coastal zone needs to be maintained.

- Co-operation among nations to promote the development and transfer of technology specifically directed to the needs and interests of the local population and situation needs to be enhanced.

5.2.7 Regulations

Regulations must recognize that marine and coastal resources are multi-dimensional and cut across administrative boundaries and departments. Regulations must be supportive of sustainable management of our marine and coastal resources. New policies and laws would be required to support this.

- The responsibility of the management of the marine resources and areas are today with different agencies, whose mandates may not be complementary. A National Maritime Agency is needed for the holistic management of marine resources and areas. Longest possible stretches of the coast need to be placed under a single authority so that strategic planning for the concerned zone takes place.

There is a need to make decision makers aware of the importance of the oceans and its influence on various factors that are critical.

- There is need for a coordinated policy and steps to acquire knowledge of ocean resources as well as the technology to exploit them.

- Ways in which the navy and the coast guard can further participate in the management of marine resources need to be explored.

5.2.8 Capacity Building

The oceans have a great potential to be explored and used sustainably. Government, non-government, research and academic institutions and the communities must be able to recognize the inter-relations in coastal zone management and the benefits of sustainable development of coastal and marine resources. Capacities of the people involved in these need to be built to achieve and practice sustainable management of marine and coastal resources.

- The capacity of coastal communities and governments (national, state and local) to develop and implement programmes in integrated coastal and ocean management need to be enhanced. Building of adequate capacity to explore, exploit and sustainably manage the resources of the oceans. The three basic challenges of biodiversity conservation, community development and viable eco-tourism are to be met.

- More trained marine taxonomists are needed. There is an urgent need to document our marine biodiversity. To overcome the shortfall of taxonomists,

students and teachers of colleges and schools could be trained to undertake studies in the coastal areas. Educators need to look at the multitude of closely interrelated factors mutually affecting each other, rather than analyzing one factor at a time.

- A cadre of youth from among the coastal communities need to be capacity-built to spread awareness among their own people and visitors about the vital importance of conserving coastal biodiversity and utilizing the resources in a sustainable manner. Local communities especially youth should be trained to scientifically and sustainably harvest various resources.
- Organizations of fishworkers need to be encouraged and members trained to manage the organizations professionally. Fishworkers organizations should also have representation of women from the fishing community.
- Capacities of the regulatory authorities to effectively implement the laws and policies related the marine areas need to be built. Regulatory agencies need to adjust to be also oriented about interrelationships of the entire marine area and not to just look at oceans in isolation.

5.2.9 Public Education and Awareness

Public awareness and education on the importance of protection of the coastal and ocean environment helps to meet social and economic needs and aspirations of the country in the long run.

- Awareness campaigns on existing regulations for management of coastal areas need to be conducted. Education and communication material on the need for conservation and protection of rare and endangered species need to be developed.
- Research findings on marine resources, their development and management have to be demystified. The educational and communication material targeted at the public has to be developed in local languages.
- Opportunities for interactions between communities, policy makers, regulating agencies, NGOs, scientists, etc. need to be increased.
- Appropriate strategies and decision making tools that would enhance the capabilities of professionals, Government, and non government organizations to take up local and community level action programmes need to be developed.

Every human should have the idea of taking care of the environment, of nature, of water. So using too much or wasting water should have some kind of responsibility and with that, a sense of discipline.

The Dalai Lama

5.2.10 Coastal Tourism

Alternative tourism, eco-tourism, sustainable tourism, etc. are today increasingly becoming popular. These could have adverse economic, social and environmental impacts if not practiced properly. Carefully thought-out policies are necessary to ensure that the tourism practiced is sustainable.

- Coastal tourism management guidelines need to be formulated involving all stakeholders (private, public, international, national, and local). The guidelines should reflect the needs and aspirations of those who have or would have a stake in this.

- A national master plan on coastal tourism, including cruise tourism needs to be developed with inputs from local, national and international agencies. The master plan must be coordinated with plans of other economic sectors (private and public)—fishery, forestry, mineral and oil exploration, urban planning, etc. A mechanism to coordinate between various sectors—tour operators, public and private sectors, regulatory agencies, scientific and social groups, tourists, etc. is needed.

- Those groups and individuals must be compensated, who suffer economic loss due to tourism development. Tourists and tour operators must be charged the "true cost" of the resource used.

5.2.11 Disaster Management

Disaster response cannot be handled by legislation alone. The entire community needs to be aware and part of the process. Adequate research and planning is needed to focus on ways to mitigate the impact of disasters.

- Policies and measures are needed to mitigate the consequences of natural disasters in coastal areas. Such policies should include early warning systems, better preparedness and preventive measures. Development strategies should include policies to reduce vulnerability to disasters, based on vulnerability assessments and adaptation strategies.
- Disaster management plans should include not only plans to minimize and mitigate the effects of disasters, but also immediate relief and subsequent rehabilitation.
- Disaster Management/Response plans should be made known to the general public, especially the coastal communities who are most vulnerable and affected.

5.3 Wetlands

Wetlands cover about six per cent of the earth's land surface. They are found in every part of the world and include a wide variety of habitats-– coastal, tidelands, freshwater marshes, bogs, fens, floodplains, and swamps. They are among the most important and productive ecosystems on earth, though often not recognized as such. The disruption of the wetlands has a high cost—economically, socially and ecologically. The management of wetlands will succeed only when there is cooperation between the government (all levels), non-government and private sectors and the civil society.

Learnings and Perspectives

5.3.1 Management of Wetlands

- Management strategies should not look at wetlands in isolation, but must look at the catchment areas and coastal zones, and also the way land is

used. Increased international cooperation to manage wetlands is needed, as wetlands may not follow geographic boundaries of states and countries. All countries must recognize the need to protect local habitats and paths/ corridors for all migratory species.

Wetland conservation projects must look at both social and economic factors, in addition to ecological factors.

5.3.2. Participatory Management

- Views of the local population must be taken in developing management plans for wetlands. Incentives to encourage traditional and sustainable activities in these wetlands must be provided.

- The local population, scientific organizations in the region, NGOs and the local regulatory authority needs to collaborate and cooperate in planning and managing the wetland. Women and youth should be consciously included in the community groups. Local communities need to be part of the process, from assessing the environmental impact of the development projects. The findings of such studies must be made available to the public.

- Local organizations that represent various stakeholders should be strengthened. Opportunities must be provided for the stakeholders to meet, discuss and arrive at locally appropriate management strategies. Local groups must be involved in implementing restoration of wetlands that are either ecologically in a critical condition or reaching a critical condition.

5.3.3 Regulations

- Legal and management support needs to be provided to effectively oversee management of wetlands. Mechanisms to check use of water, reclamation, discharge of untreated effluents from industrial, domestic and agricultural wastes, introduction of invasive species, etc. need to be improved.

- In addition to looking at social and economic factors to manage the wetlands, the political, inter-jurisdictional, institutional, legal and financial supports must also be in place to appropriately complement the efforts at local, regional and national levels. A process needs to be established for the different departments of the government to collaborate on various issues related to the management of wetlands.

- 'True cost' of the resource used must be charged, and the income so generated must be used to manage the wetland.

5.3.4 Information, Research and Development

- Research needs to be undertaken for identifying wetlands and classifying them according to their ecological status. The flora, fauna (including migratory species) and other resources (nutrient deposits) needs to be documented, and system developed to monitor and update the information. Wherever possible the values of the wetland should be quantified and strategies suggested to use the wetland sustainably. Networks for monitoring

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and exchanging data on water quality, quantity, uses of the wetland for various purposes, etc. should be established.

- Studies need to be undertaken to understand the minimum flow requirements of water to maintain the natural system in the wetland. Potential growth of population must be kept in mind while undertaking all studies.

- Adequate financial and infrastructure assistance must be provided to carry out research activities.

Chandan Kankonkar
WSSD School Competition

5.3.5 Capacity Building

- Managers of wetlands must be professionally trained to conduct environmental impact assessment, and to establish, protect and implement strategies for management of wetlands, and most importantly understand the integrated nature of wetlands.

- The capacities of the local organizations must be enhanced to improve their organizational, planning, managerial, financial, negotiation and evaluation skills.

- The local population must be trained to apply ecological understanding in the sustainable use of wetlands so that they benefit economically and ecologically.

- Capacity building of local college teachers and students is necessary so they can undertake studies to understand the demands on wetlands and their impact on the ecology and economy of the area, in addition to documenting the environmental quality, flora and fauna of the wetland. They must also be trained to regularly monitor the situation.

5.3.6 Public Education and Awareness

- Education and public awareness are critical factors that contribute to the success of any wetland management plan. These programmes must generate awareness among people about the functions, services, and values of the wetlands, so that they are perceived as important both ecologically and economically. Awareness and education programmes must aim to build up public support for conservation of wetlands, and enhance abilities to be involved in planning and managing the wetland.

- NGOs and local management committees must take on the responsibility to conduct awareness programmes. Educational programmes must be looked at as a long-term process that would bring a change in the attitude of the public. The importance of education and public awareness must be recognized in any policy formulated for wetland conservation.

- Sustainable wetland practices from various areas (regional, national, international) must be disseminated and shared.

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6. Biodiversity, Forests and Wildlife

Biodiversity is defined as variability and variety in life forms including genes, species and ecosystems. Biodiversity conservation seeks to maintain life support systems provided by nature. Adding to the impact of natural processes, human intervention has had an adverse effect on these life support systems and thereby on biodiversity. Much attention therefore has been focused internationally on formulating policies towards the conservation of biodiversity over the past decade.

While the Convention on Biological Diversity (CBD) was signed in December 1992 with 177 signatories to date, there are major issues relating to the translation of its tenets into national governance systems. As widely acknowledged since Rio, multisectoral implications need to be a part of planning development at the local, regional and national level. Each signatory has started working on, and some countries have already completed their National Biodiversity Strategy and Action Plans which attempt to address the main tenets of the CBD which are: conservation, sustainable use and equitable sharing of benefits. However the ground reality is that the concerns of the CBD have not yet been mainstreamed because biodiversity is affected by market valuation as well as by the fact that there are concerns related to its conservation, sustainable use and equitable sharing of benefits with regard to subsistence, livelihoods, development, governance and other issues.

Learnings and Perspectives

6.1 Conservation and Management

- All policy and legal instruments must stem from an authoritative and accurate data base on biodiversity. The data base needs to be scientifically compiled, standardized and continuously updated at the local level and compiled at the regional and national level.
- Critical trends such as degradation/fragmentation of habitats, extinction of species and destruction of unique habitats need to be monitored on an ongoing basis.
- Indicators of environmental quality of all ecosystems need to be identified and monitored with the help of research/scientific institutions.
- Conservation and management measures must involve full stakeholder

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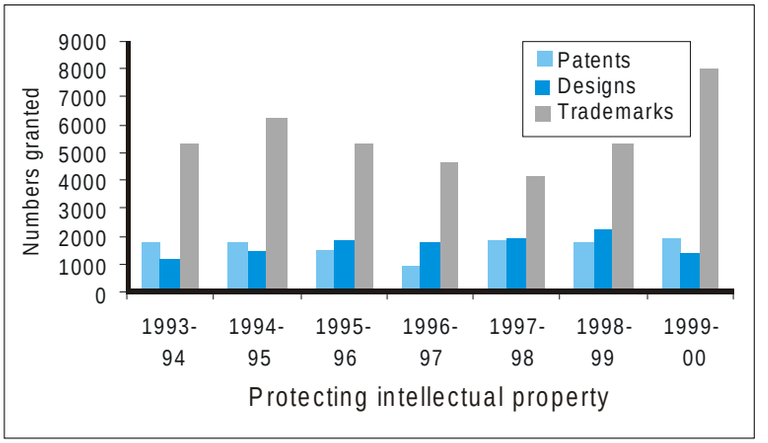
participation, be ecologically appropriate, and yield sustainable benefits to people.

- Conservation management must move towards more participatory egalitarian processes and must ensure the provision of tenurial and livelihood security to those most dependent on biodiversity, particularly the landless, tribal societies and women and children.
- Ecosystem specific approaches and the use of select indicator species can help focus conservation strategies.
- Policies supportive of programmes for captive breeding and reintroduction into the wild for critically endangered species are needed.
- The impact of human activities on natural habitats including use of pesticides and chemicals, need to be monitored and documented.
- New national guidelines need to be developed for tourism, particularly in Protected Areas, in a manner compatible with objectives of wildlife conservation and management of protected areas.
- Natural disaster management needs special attention as wildlife and forests are often destroyed by floods and other natural disasters.
- Rural energy planning, renewable energy and development of technology for increasing the efficiency of energy use are crucial to conservation.
- To protect resources and the environment, environment-friendly technology needs to be promoted through well managed schemes.
- International cooperation needs to be promoted and policies/ agreements formulated for transboundary conservation across Bioregions.



Source: Statistical Outline of India, 2001-2002, Tata Services Limited

6.2 Trade and Biodiversity, and Related Issues

- International trade has conventionally been destructive of biodiversity and people's livelihoods, by encouraging over-exploitation of natural resources, creating pollution through increasing transportation as well as habitat loss by infrastructure development.
- The World Trade Organization needs to focus on trade matters without linking trade with social issues. India is opposed to multilateral rules on investment and competition in the WTO, as well as in linking trade with social issues.
- There should be international recognition of effective and credible *sui*

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generis systems of protection of biodiversity and the associated traditional knowledge, including by way of prior informed consent and benefit sharing for traditional knowledge used by patent applicants and others.

- International Property Right (IPR) protection should not displace the developing countries as competitors, and transform them into mere suppliers of raw materials. Patenting of biological resources must not deny or restrict developing countries' access to their own biological resources.
- International cooperation and initiatives are required to strengthen the monitoring of bio-piracy and to establish international mechanisms to ensure equitable sharing of benefits from the use of biological and genetic resources.

6.3 Capacity Building

- Existing mechanisms for recruitment, training and career development of Protected Area personnel need to be reviewed and strengthened. A professional wildlife cadre capable of helping to achieve the above objectives needs to be strengthened and sustained.

Parth Shah
WSSD School Competition

- The study of traditional knowledge must be coordinated with anthropological/social science institutions, with a view to apply such knowledge to wildlife management and to obtain IPRs to benefit local communities and the nation.
- People from all sectors especially women, the landless, and socially and economically backward groups need to be empowered through capacity building to conserve and use biodiversity sustainably.
- Capacity building for local communities, forest personnel at all levels, elected representatives, decision makers, and bureaucrats needs to include the provision of technical skills.
- Livelihood issues remain at the apex of biodiversity conservation strategies in a populated and resource challenged country like India. Livelihood generation through skill creation and creation of opportunities in all sectors is a critical priority.

6.4 Governance

- All decision-making and implementation authorities concerned with biodiversity conservation, such as the Forest Department, must provide internal skill building and human resources to enable accurate identification and scientific documentation of the areas under their jurisdictions.
- All specialized research organizations, NGOs academic institutions, etc. must pool efforts and information to build a biodiversity database. This database and information must be available for scrutiny, which will also ensure that the information is updated regularly.

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- The role of commonly found as well as rare species in improving productivity of soil and in controlling pests must be specifically documented and this knowledge widely disseminated to ensure conservation and its integration into agriculture and health strategies.
- A coordinated approach to the identification and assessment of the ecological impact of alien invasive species must precede the development of strategies to control and eradicate those that have become pests or a menace.
- Transparency and easy access is necessary to protect the indigenous knowledge of people against bio-piracy as well as the development of a system for use of this knowledge (intellectual property protection).
- Policies related to management of environment, wildlife and natural resources need to be reviewed and amended, taking into account India's traditional practices, to stimulate community involvement in management.
- Sacred groves, religious landscapes and ponds which have been an integral part of traditional Indian ethos of conservation are currently eroding. There needs to be a strong policy that reinforces these traditions.
- Communities must be allowed to use Non-Timber Forest produce for employment and income generation, so long as there are safeguards to ensure that this is done sustainably .
- A separate policy needs to be formulated on fuel and fodder to prevent deforestation. This needs to consider energy needs and alternatives.
- Encroachment of forests, parks/sanctuaries/fringe areas abetted by political support is a major concern despite Forest/Wildlife Laws. Strict enforcement of existing laws is needed.
- A zoning atlas for industrial development is needed for every district. Conservation priorities need to be integrated into these zoning maps. Often chemical industries are shifted to sensitive coastal areas. Integrated and coordinated planning is needed to protect conservation goals.
- Monitoring and evaluation of Government-enacted forest laws and policies need to be entrusted to independent institutions/NGOs working to conserve biodiversity.
- Institutional conditions need to be created for developing new methods and mechanisms for planning and conflict resolution. Government must adopt a holistic integrated approach and facilitate NGOs and other institutions and their conservation efforts.
- All development projects, dams, mining, road building, railways etc. must be evaluated from a biodiversity and environment point of view.
- National planning has not adequately taken into account the ecological and economic consequences of extracting short-term commercial gains from wildlife habitats. It is therefore necessary that the Ministry of Environment and Forests should approach various ministries to integrate their activities in such a manner that effective wildlife conservation takes place.

"Biodiversity is the basis for nutritional adequacy and food security and hence it should be preserved and managed for a sustainable future."

S. Bisaliah
Multi-stakeholder Consultation

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6.5 Education and Public Awareness

- Education and awareness promotion measures for different target groups need to be reviewed and strengthened with the help of ministries of Human Resource Development, Environment and Forests, University Grants Commission, Universities, scientific institutions, NGOs, etc.

- Greater role of mainstream media in highlighting successful conservation case studies and initiatives by the NGOs and the general community is required.
- Bioregional information centres must be established to heighten public awareness and to support biodiversity.
- Education has to be recognized as a tool for change, and adequate resources allocated in the annual budget and in five-year plans.
- All the national and state administrative training academies must incorporate induction and in-service modules on biodiversity related issues, including environmental economics.

6.6 Mobilizing Financial Resources for Conservation

- Collaborative biodiversity conservation projects need to be developed to draw international funding and state-of-the-art techniques and expertise.
- Mechanisms to fund grassroot organizations and initiatives need to be developed.
- Governments, multilateral development agencies and NGOs need to jointly work on establishing biodiversity conservation funding resources and mechanisms for disbursing them.
- Funding agencies such as GEF etc. should expand their area of work to include those programmes which meet regional priorities.

We share the earth not only with our fellow human beings, but with all other creatures.

The Dalai Lama

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7. Sustainable Urbanization

Provisional data from the Census of 2001 reveal that over 285 million persons, or nearly 28 per cent of India's total population of over a billion (up 21% from 846 million in 1991), live in urban areas, against approximately 26 per cent in the previous census. This rise of two percentage points is lower than most projections made during the 1990s, which suggested urbanization levels of 30 per cent or more by 2001. But the resulting growth (68 million—up 31% from 1991) in urban population is more than the total populations of major countries such as the UK or France. And India's total urban population is the second largest in the world after China's, and higher than that of all countries put together, barring China, Russia and the USA.

The overall increase in urbanization over the decade has not been very dramatic, but its distribution is noteworthy. Nearly 38 per cent of urban India lives in cities of million-plus population—close to 15 per cent in three urban agglomerations (UAs) of over 10 million each, about 9 per cent in five UAs in the range of 3-6 million, and nearly 15 per cent in 27 UAs or cities of 1-3 million. The remaining 62 per cent lives in some 3,600 small and medium towns (5,000-100,000 population) and cities of less than a million. A major part of the growth is directed to about 30 cities in the million-plus category, which added an average of 33 per cent to their populations in a decade.

The Urban-Rural Growth Differential continues to be high. This has serious implications for the kind of urbanization happening in India. An important concomitant of development, urbanization has to be viewed in its regional context. The city serves as an important service and exchange centre for its hinterland. It draws upon the resources and assets—material, human and environmental—of the hinterland. Urbanization can be sustainable only if it has a symbiotic relationship with developmental processes in the hinterland.

Over the decade since Rio, India has taken a number of noteworthy initiatives to address problems and issues of sustainable urbanization:

Initiatives at the international level

India's status as signatory to a number of environment-related agreements has encouraged better environmental performance in some areas, notably in management of hazardous wastes, emissions of pollutants and Green House Gases by motor vehicles, in polluting industrial processes and in CFCs, all of which have significant bearing on the urban environment.

Initiatives at the national level

A legislative milestone in governance is the Constitution 74th Amendment

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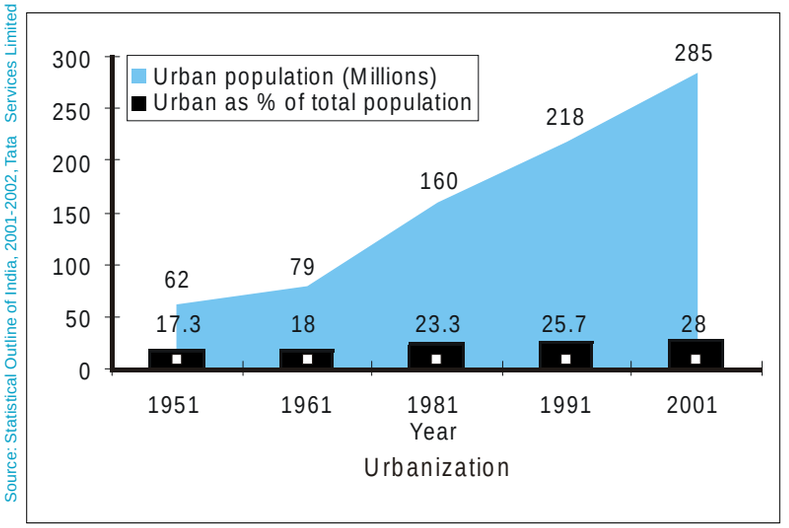
Act (1992), which devolves significant functions and powers to Urban Local Bodies, especially in respect of protection of environment and 'promotion of ecological aspects.' This amendment has created possibilities of building institutional mechanisms to involve citizens more closely in local governance, and has also led to some innovative urban finance mechanisms being attempted.

The National Housing and Habitat Policy, 1998, significantly lays down the role of all the stakeholders in achieving the goal of providing shelter to all.

Another important legislative initiative with far-reaching implications, particularly in the area of habitat and shelter, was the repeal in 1999 of the Urban Land (Ceiling and Regulation) Act of 1976.



Source: Statistical Outline of India, 2001-2002, Tata Services Limited

In the area of policy, "despite the Report of the National Commission on Urbanization (NCU), 1988 ... the country is yet to evolve a National Urban Policy ... The Planning Commission ... constituted a National Task Force on Urban Perspectives and Policy in 1995. Three Technical Groups were constituted on the subjects of Urban Perspectives and Policy, Urban Infrastructure and Urban Planning ... After the reports of the Technical Groups are available the Task Force will finalize its recommendations. These will provide inputs for the National Urban Policy" [Government of India, Ministry of Urban Affairs and Employment, 2002].

As a result of the NCU report, the Eighth Five-Year Plan (1992-97) "for the first time explicitly recognized the role and importance of the urban sector for the national economy. While the growth rate of employment in the urban areas averaged around 3.8 per cent per annum, it dropped to about 1.6 per cent in the rural areas. Therefore, the urban areas have to be enabled to absorb larger increments to the labour force. The Plan identified key issues in the emerging urban scenario:

- The widening gap between demand and supply of infrastructural services badly hitting the poor, whose access to drinking water, sanitation, education and basic health services is shrinking.
- Unabated growth of urban population aggravating the accumulated backlog of housing shortages, resulting in the proliferation of slums and squatter settlements and decay of city environment.

- High incidence of marginal employment and urban poverty as reflected in the National Sample Survey 43rd round ... 41.8 million urban people live below the poverty line" [*ibid*].

Other initiatives with significant implications for the urban environment consisted of the notification of rules such as the Hazardous Wastes (Management and Handling) Rules, 1989; the Biomedical Waste (Management and Handling) Rules, 1998; the Motor Vehicles Act, 1998 which requires that vehicles obtain regular 'Pollution Under Control' certification to monitor levels of suspended particulate matter and noxious gas emissions; and the Recycled Plastics Manufacture and Usage Rules, 1999. The last named in fact cover even the use of virgin plastics, especially in respect of bags made of sheets less than 20 microns thick. The Batteries (Management and Handling) Rules, 2000, applying to lead batteries, make it compulsory for manufacturers, assemblers, recyclers, importers, retailers and customers to ensure that used batteries are recycled in an environmentally sound way and by authorized dealers, and that new batteries are sold only after confirming that the old batteries which they replace have been given for proper recycling. A committee constituted by the Supreme Court to look into Solid Waste Management in Class I cities (pop.>100,000) submitted its detailed recommendations in 1999.

An important development at the national level is the growing awareness and expression of concern in various quarters—citizens, NGOs, Government—about the environmental and sustainability issues connected with urbanization. The judiciary, driven by public interest litigation or by *suo motu* cognizance of the situation, has delivered a number of judgments supportive of urban environmental concerns.

Initiatives at the local level

The various notifications issued by the Government, cited above, are being progressively implemented in several urban areas. Besides this, a few cities have published annual reports on the state of their environment. Partnerships between Urban Local Bodies, NGOs, stakeholder groups and, in some cases corporate entities, in critical aspects of environment such as solid waste management, reduction of industrial pollution, water harvesting, urban greening and slum improvement have emerged in some places. Initiatives at varying stages of fruition are on to corporatize urban services in order to make them functionally and financially more efficient and accountable. Some, such as slum-networking and corporatization of water supply and sanitation, seek to integrate cross-sectoral demands and needs, for example between the industrial and the domestic sectors. There have also been efforts by corporate providers of some urban services (notably electric supply) to promote reduction of waste and introduction of efficient practices by shifting focus from Supply Side to Demand Side Management.

The Local Agenda 21 mechanism, emanating from Rio, does not appear to have worked as well in Indian urban centres as it is reported to have worked

All in this manifested world, consisting of moving and non-moving, are covered by the Lord. Use its resources with restraint.

Ishopanishad
Circa 1500

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in some other parts of the world. But wherever stakeholder groups with focused agendas have acted, the outcomes have often been promising, in keeping with the spirit of Local Agenda 21 objectives.

Among the various post-Rio urban initiatives at the global level, the Sustainable Cities Programme (UNCHS-UNEP) is being implemented with varying degrees of intensity and effectiveness in five major cities, with official as well as spontaneous actions in the areas of environmental sustainability through legal, infrastructural and environmental management actions; social equity through affirmative policies and rights movements; economic growth with redistribution through poverty alleviation, housing and shelter programmes; and political empowerment through decentralization of urban governance and NGO-led capacity-building activities. Some cities have received the UNCHS Best Practice Awards for particular projects. However, all these achievements have been isolated events, not part of a countrywide process of mobilization to address urban environmental concerns.

New Issues to be Addressed

In the decade since Rio, a number of new factors bearing on sustainable urbanization have emerged, which must be added to the official perception evident in the Government statement quoted above.

- Liberalization of the economy has accelerated the pace of industrialization, but in some of the most developed (and most rapidly urbanizing) parts of the country, polluting chemical industries play a significant part in this development.
- The increase in economic activities and livelihood opportunities accompanying this industrial growth, without matching access to infrastructural resources for the urban poor, is an important cause of growth in urban informal sector housing lacking in basic services.
- Because of unregulated urban development, natural and man-made disasters, though not inherently a new phenomenon, are causing unprecedented scales of damage to both private and public urban property.
- The number of motorized vehicles has increased, with growth of personal transport far exceeding that of public transport, leading to higher levels of air pollution.
- Increased consumption has led to generation of more waste and pollution.
- The use of water and energy by urban areas has dramatically increased, leading to shortages and an urgent need for better sharing of these precious resources, both between the different economic classes and sectors within urban areas and between urban and rural areas.

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- Many livelihoods are perceived to be under threat from the forces of Liberalization, Privatization and Globalization in general, and from global business in particular.

For urban as well as rural India, these manifestations of urbanization are placing tremendous stress on the environment, giving cause for grave concern.

Urbanization today is inextricably linked with development, which one writer explains as "(the) fundamental structural and social changes that, once accomplished, cannot be undone. (Its) classic indices include: birth rates, levels of education, consumption patterns, life expectancy, household size, and the status of women" [Polèse, 1997].

The major impetus to urbanization in modern times has been a shift in livelihoods from primary to secondary and tertiary sector-based occupations. It places economic, social, infrastructural and environmental pressures on both urban and rural areas, leading to serious concerns about its sustainability.

The foregoing discussion leads to the conclusion that while many desirable initiatives have already been taken to set India on the path to sustainable urbanization, much more has to be done in order to fulfill the objectives of these initiatives. India's record at the policy and legislative levels has been good. The obstacles to realizing the underlying intentions lie mainly in the areas of governance, planning, management and education. Some of the key interventions needed to overcome these obstacles are discussed below:

Learnings and Perspectives

7.1 Integrating Urban and Rural Issues within Urban Policy and Planning

The resources which support cities—food, energy, water, raw materials for economic activities, human resources—flow largely from outside urban limits, often at the cost of the developmental and environmental capital of the areas contributing them. Urbanization can be sustained only if overall regional development is sustainable and equitable. For this, an integrative approach is necessary between urban and regional development planning in terms of land-use, resource allocation, equitable and mutually complementary resource flows between the city and its hinterland, and institutional and infrastructural mechanisms to enable these to happen.

- Urban growth must not be incrementally agglomerative, consuming forest and agricultural land, water bodies and other environmental assets. It should be directed in a planned and locale-specific manner, to existing contiguous settlements, which can receive it, leaving intervening open stretches of land unencumbered. The capacity of these settlements to accommodate growth must be enhanced by improving transport and other infrastructure to and in them.

- Land use planning and regulations must be made comprehensive to support the goals of sustainable urbanization. Special attention must be paid to the issue of land-recycling to create assets compatible with contemporary needs of the urban environment.
- Cities produce large amounts of waste, which pollutes and degrades the environment both within and outside their limits. Planning and management mechanisms (including waste minimization) must be evolved and implemented to correct those aspects of urbanization which promote such negative cross-boundary impacts.

"Urbanization holds out both the bright promise of an unequalled future and the grave threat of unparalleled disaster."

Kirtee Shah
Multi-stakeholder Consultation

7.2 Making Cities and Urban Systems More Energy-Efficient

Cities consume high levels of energy for water supply, transport, waste management, commerce, industry and many other functions. Much of this consumption is inefficient and wasteful, leading to deprivation or scarcity in sectors which could use the same energy in more productive ways. Policy interventions and management mechanisms which minimize such waste of energy are necessary.

- Building heights should be regulated to reduce the energy costs of lifting water and vertical movement of people and material.
- Measures should be adopted to encourage recovery and reuse of wasted energy in commercial and industrial processes.
- New energy saving technologies should be aggressively promoted in all sectors including the domestic and commercial, with imaginatively conceived demand side management, pricing and subsidy mechanisms to make them attractive and viable.
- Use of private transport should be regulated for optimal capacity utilization.

7.3 Promoting R&D In and Use of Alternative Energy Sources

The commercial energy presently used in the urban sector is produced mainly from non-renewable resources, or by methods potentially harmful to the environment, or both. The efforts made so far to produce energy from non-conventional, renewable sources—mainly based on technologies developed by countries of the North in their own environmental and economic contexts—have moved in fits and starts at the policy, research and implementation levels. Often such energy is either commercially unviable compared to that produced by traditional technologies, or (as in the case of solar cooking) it requires radical changes in established cultural practices.

- Locally appropriate R&D to develop non-conventional energy sources should be encouraged and promoted, especially in the area of solar energy, which is abundantly available in most parts of India, as well as wind energy wherever practicable.

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- Imaginative costing and recovery mechanisms should be evolved to make energy from non-conventional sources commercially competitive with conventional energy.
- In the urban context in particular, R&D in human waste-based biogas generation to supplement other commercial fuels must be undertaken, supported by a programme of awareness building, skill development and education. This is one case where the supply of raw material is bound to keep pace with population growth.
- R&D work should also be targeted at deriving organic manure from municipal and agricultural waste in order to reduce the quantum of such waste requiring disposal.

7.4 Investing In and Development of Relevant Economic, Social and Environmental Infrastructure

People must be placed at the centre of planning concerns. The quality and efficiency of infrastructure play a major role in determining the quality of urban environment, and consequently the quality of life of citizens. Sustainable urbanization is not possible without appropriate physical, economic, social and environmental infrastructure. Such infrastructure includes water and sanitation, public health and education facilities, recreational spaces, open spaces and transport.

- Scarcity of potable water is an emerging crisis area. Approaches to addressing it, such as new and better methods of reduction of waste, managing demand, harvesting rainwater, recharging aquifers, and recovery of water from sewage, sullage and industrial effluents should be seriously explored.
- The existence of a number of coastal urban settlements also calls for exploration of viable desalination technologies to augment water supply.
- Inherently interdependent infrastructural services, such as water-supply and sanitation, must be integrated to derive maximum equity, performance efficiency and investment returns. Integrated planning of urban water supply and sanitation networks is an important first step towards addressing water scarcity.
- The provision of adequate water and sanitary facilities for the urban poor must be a high priority item on the agenda for urbanization.
- Slum Networking Programmes in some Indian cities such as Indore and Vadodara have demonstrated that a sewerage network servicing the most deprived pockets of the city can in effect service the entire city economically. (Slums are usually spread across the city in low-lying areas which naturally attract, under gravity, flow from the entire city; laying sewers mainly along

natural gradients minimizes both their depth below ground level and the need for pumping stations, while extending the area serviced to include non-slum pockets built on higher ground). The gains of and learnings from such initiatives must be consolidated, improved upon and applied in other cities.

- The emphasis in the role of public health services should progressively shift from curative to preventive and positive health care. A significant proportion of morbidity in society is environment-related. It is more appropriately addressed through emphasis on education and awareness of the served population and empowering it to participate in managing preventive health care related to environmental sanitation and hygiene.

Ulfa Khwaja
WSSD School Competition

- The focus of urban transport must shift from private to public modes, and the shift made viable with effective incentives and disincentives (including investment in public transport reinforced by cross-subsidization from private transport, modification of land-use and building density regulations, Floor Space Index, vehicular access restriction and other regulations). According to some estimates, the urban poor spend as much as 25 per cent of their income on essential transport. It is necessary for urban policy and planning to provide them access to affordable transport.

- Ways and means to reverse the trend of sacrificing pedestrian thoroughfares to facilitate vehicular traffic should be explored. Traffic arteries and parked vehicles must not dominate over the urban fabric at the cost of pedestrian and civic spaces.

- Use of bicycles must be encouraged where possible, with infrastructure (such as dedicated bicycle tracks) to facilitate it and incentives to encourage it.

- Travel reduction strategies must be explored and encouraged through the urban planning process. Intermediary public transport (e.g. taxis and autorickshaws) must be regulated to make it complementary to and not a substitute for public transport.

- While progressively stringent emission standards for new motor vehicles entering the market will fulfill part of objective of reducing pollution, this achievement must be reinforced and sustained by evolving and enforcing similarly progressive standards for the maintenance of vehicles in use, and the creation of appropriate monitoring, training and certification mechanisms towards this end.

- For large urban agglomerations, the feasibility of providing appropriate mass-transit systems must be explored and translated into ground reality. In places where the rudiments of such systems already exist (Mumbai, Chennai, Kolkata) they must be extended and updated using state-of-the-art technology). The town planning and management interventions necessary to make a success of mass-transit systems must also be actively pursued.

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- New and emerging information and communication technologies are leading to a gradual decrease in the premium on location in urban areas, making the distinction between 'place of work' and 'place of residence' less critical to urban dynamics and form. They have the potential to effect changes in land use and traffic patterns. Transport and land use planning must harness this potential to influence the course of sustainable urbanization.

7.5 Focus on Shelter

In the urban informal sector, slums are places of both residence and work. They contribute significantly to the creation of wealth in the urban economy. The urban poor have capably demonstrated their ability to invest in and improve on shelter given even notional security of land tenure. It must be recognized that slums are not a problem but a solution to a problem, evolved by people using their own ingenuity and resources. Official policy must encourage this process, intervening only to the extent of making it orderly, integrating it with overall urban development, and focusing on the provision, with people's participation, of infrastructural services—which lies beyond the capacity of individuals and small groups—in the areas of investment, technical inputs and management. Urban housing must be viewed not as a product but as a process with appropriate enabling mechanisms of legislation, management, technical support and finance, together with a legitimate recognition of the propensity of people to invest in their own shelter.

- Shelter at minimum acceptable standards of habitability, guided by economically realistic building and planning codes (especially for the urban poor) is crucial to urban infrastructure. Those living in self-created substandard shelter should be given help and guidance in progressively improving it according to their capacity for investment in a convenient time frame.

- Building and planning codes for the lowest income groups should be reviewed and revised taking cognizance of the fact that for many people in this group the same shelter serves as living space and work space.

- At least a notional security of land tenure must be granted to inhabitants of unorganized sector housing, in order to encourage them to invest in the improvement of their own shelter and to facilitate the provision of infrastructure by local bodies.

- Innovative housing finance mechanisms for the urban poor should be evolved, including affordable loans at concessional interest rates and realistic collaterals.

- To help the urban poor invest in housing stock, assistance should be made available in terms of building materials banks, technical guidance in construction and planning for integration into citywide networks such as water-supply and sewerage.

7.6. Ensuring Security of Livelihoods

All development affects livelihoods. It creates new opportunities while posing a threat to some traditional occupations. In order to be sustainable, development must offer, to those whose jobs and occupations are at risk, opportunities which they can recognize and convert to their own advantage. For the urban poor in low-skill, marginal occupations, livelihood has several critical dimensions. Rapid economic changes in response to changing market currents may place not just individual livelihoods but entire livelihood categories under threat. Such vulnerable groups in urban areas must be provided with appropriate security nets, opportunities for developing new skills, appropriate entrepreneurial skills and social welfare programmes for basic survival.

- Sustainable development, especially in the urban-based sectors, demands urgent and strong policy measures to safeguard the livelihoods placed at risk by the forces of liberalization, privatization and globalization.
- Programmes of skill and versatility development, backed by support for promoting small-scale entrepreneurship, management and marketing must be developed for those whose occupations and livelihoods are at risk.
- Basic education for functional literacy, livelihood skills and responsible citizenship is a precondition for sustainable development. Such education must be appropriate to the social, economic and environmental context, must be of the highest quality possible within that context, and must be available to every child and youth as a fundamental right. Facilities for each child to acquire such education without being discriminated against on the basis of economic class, geographical location or cultural identity, are a must.

7.7 Emphasizing Environmental Concerns in the Agenda for Urbanization

An unpolluted, healthy and aesthetically satisfying environment, natural as well as built, conducive to overall well-being, is a fundamental right of every citizen. In urban areas health, in its broadest sense of physical, mental and spiritual well-being, is to a great extent dependent on the access of the citizen to environmental assets which support such well-being.

- Clean air and water, and places for recreation and relaxation in the public domain (such as waterfronts, parks, lakes, wooded areas, hills etc.) are necessary components of a sustainable urban environment, and must be provided for in the planning for that environment, both in terms of conserving existing assets and developing new ones.

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- Tree plantation in urban open spaces (common and waste lands, lands subject to inundation, lands on the margins of roads and railway tracks etc.) should be encouraged, to serve (a) the biomass fuel needs of the poor who, for want of affordable alternatives, use toxic forms of fuel such as rubber tyres and plastics; (b) as green cover; (c) as a deterrent to environmentally incompatible encroachment; (d) as livelihood opportunity for the poor (in partnership with various stakeholders in the urban environment); and (e) as a protective measure against the destruction of forests to meet urban fuelwood demands.
- Clear policies, and planning and implementation mechanisms, should be laid down for the protection and conservation of urban water bodies.
- Monuments, precincts and civic artifacts forming the cultural and historical heritage of urban areas, which are important as aesthetic features of the built environment and as symbols and rallying points of civic pride, must be conserved and protected from encroachment and vandalism, awareness about them promoted among citizens and visitors, and ways and means explored to involve citizens as well as urban local bodies in this process.

"Slums undergrid our city economies. We are not recognizing the urgency for the need for planning regarding slums."

Kalpana Sharma
Multi-stakeholder Consultation

7.8 Bringing Gender Issues to the Mainstream of Urban Policy and Governance

Women at all levels in society tend to be discriminated against. Urban women in particular, while continuing to perform their traditional domestic roles (thereby conforming to a gender stereotype), are also increasingly involved in earning livelihoods; in many poor households they are often the principal or the sole breadwinners. A major thrust at the policy level is necessary to ensure equity and justice to women in the urban environment. The Constitution 74th Amendment has made a beginning by ensuring representation for women. But much remains to be done in the areas of access to social and economic services, social as well as domestic violence and crimes against them, and attitudinal prejudices in the establishment.

- A policy of positive discrimination in favour of women, especially women from deprived social, economic and educational backgrounds, should be adopted in order to empower them to become functionally equal members of society with men.
- Child-care support for working mothers should be provided to enable them to function efficiently as productive members of the workforce.
- The equality of women with men should be recognized in matters such as opportunities in education and employment, and access to institutional finance for entrepreneurial ventures.
- Laws aimed at prevention of discrimination against women must be reinforced with social awareness and education programmes to promote gender sensitivity.

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7.9 Evolving Appropriate Partnerships for Local Governance

The educational, occupational, cultural and economic heterogeneity of the urban population is a major asset in making urbanization sustainable; but in times of crisis the same heterogeneity can lead to conflict and social insecurity, with adverse consequences for law and order and human rights. It is imperative to evolve participatory mechanisms of urban governance, involving citizen groups and local authorities, which will provide effective means of conflict resolution.

"While the challenge of development might seem to be how to get there, the real challenge is how not to get there."

Kartikeya Sarabhai
Multi-stakeholder Consultation

- The Constitution 74th Amendment has opened up opportunities for the devolution of governance to the lowest political strata of society. These have been successfully and positively used in some cases. More should be done to make devolution effective across a broader spectrum of citizens. There is a potential role for partnerships involving citizen groups, social workers, NGOs, academics and professionals, and the lower levels of the legislative, judicial and executive wings.

- Despite some sincere, motivated and upright individuals in its ranks, the bureaucracy as a whole is perceived as being opaque and obstructionist rather than transparent and facilitative. This mindset inherited from the past is not in keeping with present-day developmental aspirations and ideals. The bureaucracy must be sensitized to simplify and streamline its procedures so as to minimize mandatory citizen-bureaucrat interfaces to the barest essential.

- It is imperative to decentralize and devolve environmental management to the lowest levels of governance and to capacity-build local government and citizen groups to participate in and take charge of such management as partners. The establishment of ward committees, with appropriate awareness, education and skill development inputs, needs to be encouraged and strengthened towards this end.

- On one hand there is a surfeit of laws, many of them outmoded and irrelevant. On the other hand, effective enforcement is lacking in respect of those laws which are relevant to contemporary concerns and conducive to good governance. While this is often blamed on lack of political will or undue political interference, most lapses in enforcement are purely due to bureaucratic indifference and unconcern, or to corruption which is in the first place bred by the irrelevance or the irrationality of the laws themselves. All systemic barriers to governance should be reviewed and eliminated, and the influences and powers at various levels which allow perversion of governance drastically curtailed.

- The emphasis in urban governance must shift from excessive regulation to an enhanced use of essentially economic instruments in the form of levies, tariffs, tradable environmental performance mechanisms and a range of other incentives and disincentives.

- The role of awareness generation and education must extend across a wide spectrum of the legislative, judicial and executive wings. It has been

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found that in many instances well-meant judicial directives pertaining to environment have run into stumbling blocks because they were not backed with adequate information about the administrative, technical and financial preconditions for implementing them. Similarly the bureaucracy, which is usually well-informed about the nature (if not always the structural causes) of various issues, must learn to anticipate problems and have alternative options ready to solve the problems. It is a waste of both judicial and executive time for each contentious issue to be brought to court before even serious thinking for action on it can begin. The role of Urban Local Bodies in this context must include the creation of environmental monitoring mechanisms involving citizen groups, academics, professionals and media persons.

7.10 Making Cities Increasingly Self-financing and Evolving Buoyant Financing Mechanisms

Urbanization heavily dependent on the deflection of resources from the hinterland cannot be sustainable in the long run. The two major finance mechanisms currently available at the local government level to Indian cities are property tax and octroi. The former is not buoyant enough to meet increasing investment and administrative demands. The latter, while buoyant, is not viewed favourably because it impedes the smooth flow of goods and commodities across the country [Rakesh Mohan, 1996]. Octroi is gradually being phased out in the country. A viable and buoyant substitute, under autonomous control of the Urban Local Body is yet to emerge. A vigorous effort is necessary to explore innovative methods of generating revenue for local bodies.

- Private participation in the provision and maintenance of many services traditionally perceived as local government responsibilities can free some financial resources for diverting to sectors which must be addressed by local government. Privatization should open up two kinds of options: (1) converting services such as urban waste management (especially composting of organic wastes) into profit making ventures and (2) livelihoods for the urban poor functioning in an organized manner to provide essential services for urban environmental management. However, "liberating local bodies from government regulatory and legislative controls may oblige (them) to come under the direct or indirect control of financial institutions, resulting in dilution of their social commitments (Kundu, 2001). It is necessary to ensure that privatization does not end up favouring those who can afford to pay for services at the cost of those who cannot, accentuating the divide between the haves and the have-nots. To the extent that such services are equally necessary for all segments of the urban population, the local bodies must not abdicate their responsibility of ensuring equitability in the provision of urban services.

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• Cities are places of opportunity, for learning, earning and living fulfilling lives. In order to make them financially sustainable, local government bodies must seize upon the potentialities to exercise every possible option to raise finances by fair and equitable means. Those who derive the maximum profits from cities must be willing to pay for the privilege of living in them and using them. Those whose labour makes them productive and profitable, must get due reward for their role. With the degree of autonomy now available to Indian cities, they must aggressively explore and exploit innovative ways of raising finances and becoming economically and environmentally sustainable. The opportunities are not wanting.

Civilization in the real sense of the term, consists not in the multiplication, but in the deliberate and voluntary reduction of wants.

Mahatma Gandhi

8. Industry and Energy

Enhancing economic growth, is the most important imperative crucial for India's progress and industrial activity is key for this. It is important to serve the triple-bottom line (TBL) of economic, environmental and social welfare through mutually supportive ways. Towards this, several Indian industries have adopted environmental management systems and corporate reporting is also becoming increasingly visible.

It is equally important to prevent any further degradation of soils, water systems and the gaseous environment, due to industrial waste run-offs, emissions and other residuals, through integration of eco-efficient production systems.

The small-scale sector in India has played a very important role in meeting the needs of the large-scale firms and even caters to the global market in terms of chemicals and chemical-intermediates. Resource optimization and waste minimization have to be principal focal areas of capacity building that will help to maintain competitive advantages.

Rapid and effective remediation of contaminated resource systems should be supported by enforcement of other preventive approaches, including drastic reduction of wastes at source.

Appropriate market-based instruments that will provide incentives for improved environmental performance, will be useful vehicles for transitioning to cleaner production regimes.

Learnings and Perspectives

8.1 Industrial Production Systems

It is important to recognize that while India's economic growth over the last twenty years has been quantified as 163 per cent, the total increase in pollution generation has been approximately 475 per cent, with industrial pollution alone accounting for 247 per cent.

- Sector and process-specific assessments for identifying cleaner production (CP) opportunities have to be carried out and production systems appropriately reoriented to minimize waste at source.
- Value addition to the significantly large quantities of wastes generated

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can help minimize resource loss. These two options are readily implementable and do not call for large investments in newer technologies.

- A suitable mix of market based instruments (MBIs) as a strong disincentive for pollution generation, and clearly defined incentives for CP have to be evolved to complement the legislative framework.
- Appropriate zoning and industrial siting that help optimize eco-industrial networking opportunities, aimed at smoothening environmental impacts, have to be employed in emerging industrial clusters.

Production of selected industries (million tonnes)

Industry	1990-91	2000-01
Cement	48.4	99.5
Finished steel	13.5	29.3
Sugar	12.1	15.5*
Fertilizers	9.0	14.7
Paper and paper board	2.1	3.1
Caustic soda	1.0	1.6
Aluminium	0.5	0.6

* Figure is for 1998-99

Source: Ministry of Finance (2002)

- Management Information Support Systems (MISS) have to be developed with empirical evidences on the linkages between environmental loads and impacts on a location and sector-specific basis. Such a MISS will be useful in demonstrating the diversity and intensity of negative externalities and reinforce judicial intervention in forcing transitions to CP regimes. An equally important spin-off will be an understanding of limitations of production systems, reflected in the quality and quantity of wastes generated. Such an understanding can guide the development of cleaner technologies and their assessment.
- The Indian public sector needs to catch up with such emerging trends as corporate social responsibility and total quality management systems.
- Disaster mitigation and improving on-site working conditions are integral parts of enhancing productivity.
- Education and capacity building of the community to monitor impacts, and contribute to participatory environmental protection, including greater support for ecofriendly products, have to be given utmost importance in reinforcing consultative forms of management.
- A well defined policy framework that invites foreign direct investments (FDIs) only on/through technologies that are not energy-material-waste intensive can substantially reduce environmental loads source and help leapfrog into clean-technology regimes.

8.2 End-of-pipe Treatment and Remediation

- Rapid and comprehensive containment and treatment of wastes should be given utmost attention to prevent accumulation of wastes and any further contamination of sinks. Such containment and treatment efforts have to dovetailed with at-source reduction of wastes. Reducing levels of

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environmental contamination and perturbations will be useful indicators of such interventions.

- Technology transfers in areas of advanced waste treatment must be guided by a comprehensive assessment of the appropriateness of technologies that can help rapidly treat the large quantities of heterogeneous wastes generated out of pollution-intensive processes being employed in the country. Suitably adapted waste-treatment systems that can transform/decompose recalcitrant wastes are the need of the hour. Technology adaptation therefore becomes a very important focus.

8.3 Hazardous Waste Management

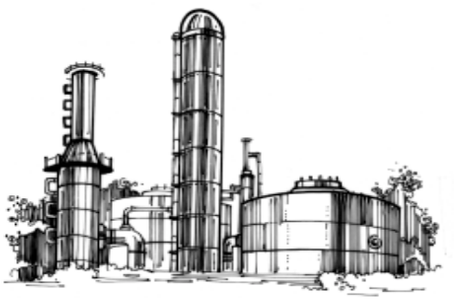
- Strict adherence to legislated transport, storage, treatment and disposal requirements has to be enforced to prevent wanton dumping in non-designated areas, to prevent further contamination of waters/soils.

- It is very important to ensure that waste-recycling facilities are indeed functioning optimally and that such systems receive only compatible wastes through imports. The problem of treatment and disposal of complex hazardous wastes gets further compounded when inadequate and inappropriate waste recycling/value addition techniques are employed.

8.4 Emissions Reduction and Alternative Energy Systems

- Improving performance of production systems through improved energy efficiency has clear implications for reducing emissions. It is important to examine the linkages between emission reduction and the implications for economic growth, which has to duly integrate compensation for loss in welfare. Cumulative carbon emission reduction targets are preferable to annual targets in this context.

It is important to recognize that while India's per capita consumption of energy is low, energy efficiencies are also low. Process-based constraints on energy systems modulate demand and the efficiencies of energy output. Accordingly, more energy-efficient technologies and advanced fuel systems with near–zero emissions need to be promoted. Eco-industrial networking applications that maximize heat/thermal energy-based output in industrial areas needs to be actively promoted.



- India's participation in bilateral/multilateral/global framework of environmental action relating to energy efficiency and related abatement of greenhouse gas emissions should be guided by only such considerations that do not compromise India's competitive and equity related advantages. In this context, tradable quotas and equal allocation of global environmental space are critical.

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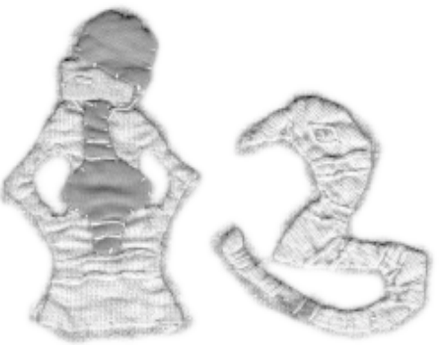
- Promoting clean technologies, and reducing energy demand are likely to minimize local pollution and even reduce carbon emissions.
- As part of one of the world's largest renewable energy programmes, in India approximately 3.27 million biogas plants, 3,38,000 biomass based chulhas and 5,90,000 sq.meter solar energy collector area, apart from 5,15,000 solar cookers have been installed. About 1450 projects have been approved in areas of renewable energy development that is expected to help generate 1650 MW and help 935 metric tons coal replacement. Experiences gained over the last two decades in India in the area of renewables—wind power, small hydro power systems, biomass-fired plants and solar photovoltaic systems—need to be upscaled to respond to emerging needs of sustainable development.
- Several fiscal incentives and subsidies including energy buy back have been devised. The Renewable Energy Plan 2012 sets out to meet nearly 10 per cent energy demand with renewables. The integrated rural energy programmes are also aimed at holistic empowerment of stakeholders. Meeting energy needs of all segments of the population in order to support growth is a high priority imperative for the country. Inter-institutional links have to be strengthened towards securing the social goals of sustained access to energy.

"Rural energy planning, renewable energy and development of technology for increasing the efficiency of energy use are crucial for forest conservation and reduction of indoor air pollution."

Abhijit K. Baruah
Multi-stakeholder Consultation

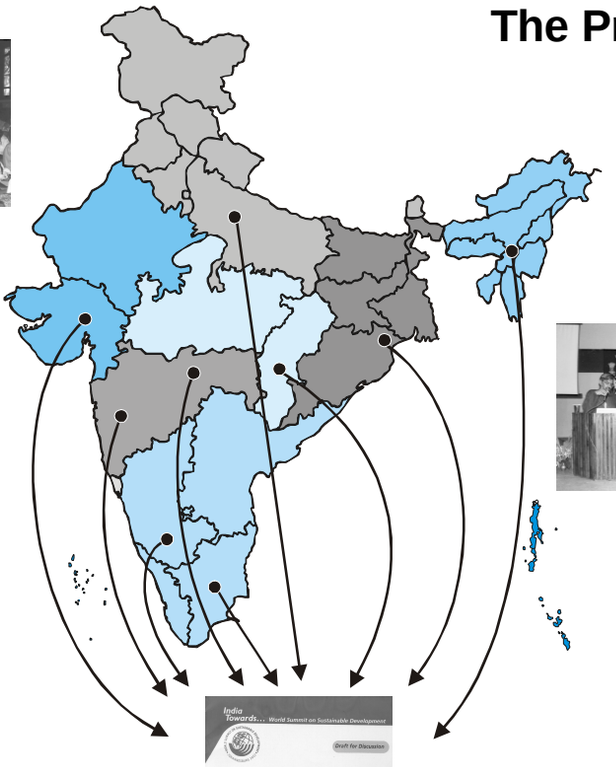


While innovating man must inevitably interfere with environment systems, it is upto the scientists, to see the way by which man will reap both short-term and long-term benefits from these innovations.

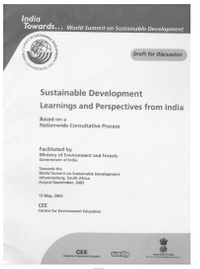
Vikram A. Sarabhai

The Process

Smaller Stakeholder Consultations



Regional Consultations



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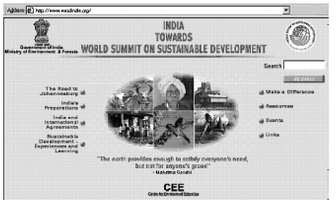

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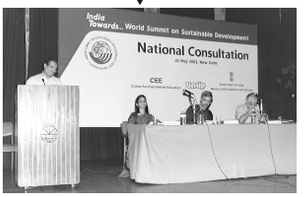
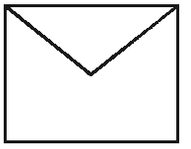


National Consultation at Delhi



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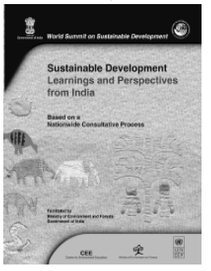

Final Document

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Inputs

From Regional Multi-stakeholder Consultations

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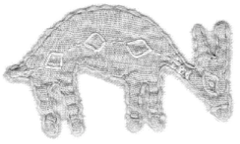

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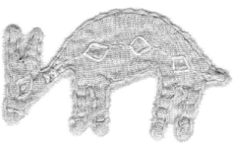

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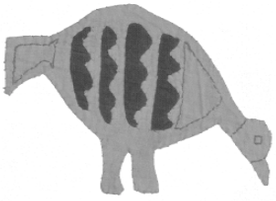

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