ENVIRONMENTAL LAW AND MANAGEMENT

Report of the National Workshop on *Environmental Law and Management*

March 30 - April 2, 1999
Kathmandu, Nepal

MOPE — Ministry of Population and Environment

SACEP — South Asia Co-operative Environment Programme

UNEP — United Nations Environment Programme

NORAD — The Norwegian Agency for Development Co-operation

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in collaboration with

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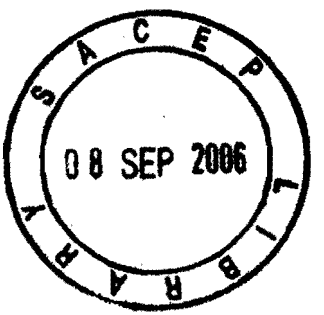

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Programme Co-ordinator: Sher Jung Karki, Legal Officer, MOPE

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His Majesty's Government
MINISTRY OF POPULATION AND ENVIRONMENT
Singh Durbar, Kathmandu
Phone No. 4245368, 4245365, 4245363, 4245364, 4241587, 4241586
Fax No. (977-1) 4242138

Ref No. :

Foreword

It has been realized for sometime now that the sectorally fragmented environmental law needs to be examined and updated for meaningfully addressing the emerging environmental issues. Fulfilling our national commitment to the implementation of international agreements also calls for strengthening the institutional capability with the necessary legislative support.

The workshop on Environmental Law and Management held in Kathmandu from March 30 to April 2, 1999 had the explicit objective of examining these needs through certain specific profiles and arriving at meaningful recommendations for further action. I think that the conclusions have been both stimulating and specific. I look forward to further profitable exercises in terms of legislative review and strengthening of institutions for addressing environmental issues within the country and beyond.

I record my deeply felt gratitude to SACEP, UNEP and NORAD for their co-operation in holding this important event.

I would also like to thank all those who were involved in conducting the workshop and in bringing out this publication for their efforts.

March 5, 2004

(Mohan Bahadur Karki)
Secretary

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Summary Report of Workshop

Introduction

The Seminar on 'Environmental Law and Management' was held in Kathmandu from March 30 - April 2, 1999. The Ministry of Population and Environment, the South Asia Co-operative Environment Program, the United Nations Environment Program and the Norwegian Agency jointly organized it for Development Co-operation.

The event provided an opportunity for policy-makers and other stakeholders to review the existing legal, institutional and policy matters. It also helped them explore possible options for consideration and implementation. The seminar was the first step in a process of revising national regulations by incorporating contemporary issues and regulatory mechanisms in compliance with national and international legal norms for realizing the goal of sustainable development. In addition, it helped promote greater co-operation among national institutions both within the government and beyond. Participants included representatives from academia, as well as various government and non-governmental organizations participated in the seminar.

Highlights of Opening and Closing Ceremonies

Opening Ceremony

Right Hon. Mohan Prasad Sharma, Chief Justice of the Supreme Court of Nepal, inaugurated the seminar. In his inaugural speech, the Chief Justice noted that the deteriorating environment is one of the major problems that Nepal is facing today. He added that various laws were promulgated, in line with international agreements to create legal backup for Nepal's efforts to protect the environment. He also highlighted the landmark decisions delivered by the courts on environment-related cases.

Hon. Ramesh Nath Pandey, Minister for Population and Environment, chaired the inaugural session. The Minister expressed

the view that as in other developing countries, Nepal's environmental challenges are emerging due to immense human pressure on limited natural resources. He stated that the country's mountainous terrain and unplanned settlements have compounded the problem and made environmental management a Herculean task. The Minister reiterated Nepal's commitment to international conventions and protocols related to the protection of the environment and added that the Ministry will seriously take up all practical recommendations of the seminar.

In his welcome address, Secretary of the Ministry of Population and Environment Mr. Varun Prasad Shrestha said that the workshop would focus on how environmental aspects could be well considered in the country's legal regime. He also expressed gratitude to SACEP, UNEP and NORAD for their support. The Secretary also urged greater collaborative linkages and hoped that the seminar would result in greater understanding of environmental implications.

Mr. Lal Kurukulasuriya, Chief of UNEP's Regional Environmental Law Program, noted that the seminar was first of a series of national seminars that were being convened in South Asian countries. He further noted that the purpose of the meeting was to review the legal and institutional regime that had been set up in the country, as well as the experience of the past in implementing environmental policy and legislation. He expressed the hope that the seminar would work out proposals for strengthening the existing regulatory regime and institutional arrangements.

Director-General of SACEP Dr. Ananda Raj Joshi expressed his gratitude to UNEP for technical assistance and NORAD for providing financial support for the seminar. He also thanked MOPE for the co-operation in the conduct of this important activity. Dr Joshi further stated that intense human activities have led to environmental degradation and, therefore, the present generation has to solve man-made problems in order to prevent further environmental degradation, while pursuing development. He went on saying that significant progress has been made in confronting environmental problems at global, regional and national levels. He

expressed the view that 'law ' remains to be the most effective means to translate policies into action.

Closing Ceremony

In his closing remarks, Mr. Shrestha noted that the seminar involved detailed and serious interactions among representatives of various responsible agencies. The Secretary further said that he was pleased with the efforts of SACEP and UNEP, which were so closely collaborating to make South Asia environmentally well managed. Mr. Shrestha expressed the view that in order to manage the environment, law alone could not be the solution, and added that social as well as biophysical aspects are also crucial. Stating that environmental management will not be effective unless serious exercises take place within a country, within a region and eventually at the global level in the spirit of international conventions, he opined that we have a lot to do. He also laid emphasis on pragmatic approaches, and consultations and collaboration at all levels. The Secretary also lauded the efforts of the participants to draw up an action plan in detail emphasizing a clear order of priority, as there are limitations in terms of resources and capabilities in our country.

In his closing message, Dr Joshi summarized the main achievements of the seminar and expressed the view that the issues raised and the recommendations made in such important areas as institutional strengthening, capacity building, information sharing, formulation of rules and regulations, are crucial. He further said that the involvement of stakeholders, including the private sector, was essential in the process of environmental management. The SACEP Director-General also stressed on the need for clearly defining the role of sectoral agencies as well as that of the co-ordinating institution.

Mr. Kurukulasuriya noted that the workshop provided an opportunity for the review of the existing legal provisions, institutional arrangements and managerial mechanisms for promoting environment and development in Nepal, adding that it also promoted partnership among various ministries, agencies and institutions. Mr.

Kurukulasuriya further noted that the seminar's short-term goals have been achieved successfully, and laid emphasis on the need for building on this achievement. He urged action and promised his organization's co-operation in implementing the work plan drawn up during the seminar Speaking on behalf of the participants, Mr. Khanal extended his thanks to the organizers. He said that the seminar provided new thoughts and visions for future work in the area of environment protection and sustainable development. Mr. Khanal further noted the benefits of the sharing of experiences from a wide variety of professional backgrounds. He also stressed the need for action noting that passing resolutions is meaningless unless they are implemented.

Presentations

1. Environmental Policy, Legislation and Management

Session One

Summary of the Presentation

In his presentation titled "Existing Environmental Policies and Institutional Structures", Mr. Varun Prasad Shrestha assessed of environmental policy and institutions in Nepal. He noted that the National Conservation Strategy, which was approved in principle by His Majesty's Government in 1987, represented the first major step to conserve the environment and natural resources in Nepal. Referring to numerous environment-related Acts, including some promulgated several years ago, Mr. Shrestha further noted that the Constitution of the Kingdom of Nepal (1990) had directed the State to give priority to the protection of the environment, and rare wildlife, forest and vegetation.

It was observed, however, that the interrelationships between population, environment and economic development had not been clearly enunciated until recently. Mr. Shrestha also noted that most of the Acts were use-oriented rather than resource-oriented. Speaking about what he called 'institutional disorder', the Secretary observed

that, "Sectoral" vision and prime urge for dominance are the major intervening elements. "Stating that with the introduction of regulating standards and EIA procedures, Nepal had departed from the old 'grow now, clean up later' paradigm. Mr. Shrestha laid emphasis on the need for changing the attitude of the people for the success of recent policy initiatives, adding that NGOs, the private sector and the press, too, had a role to play in this process.

Participant's Views

The participants said that the Shrestha paper was comprehensive and provided a perspective on the evolution of environmental policy, law and institutions in Nepal, as well as an assessment of the present state of affairs.

The commentators raised the following issues:

- The wisdom of blanket law, which tends to ignore local specificities, in light of Nepal's heterogeneous environment
- The tendency to think of law before gaining the necessary law-enforcement capacity
- Inclusion of ethnic diversity in environmental analysis
- The possibility of introducing law for protecting consumers
- Dangers of undermining indigenous resource management systems
- Creating a separate judicial organization for hearing environment-related cases
- Creating neighborhood 'tribunals' for hearing minor environmental complaints (rather than a separate judicial body)
- Avoiding institutional proliferation
- The need for striking a balance between economic growth and environment protection, especially in view of IEE and EIA requirements for industrial projects
- Problems of irresponsible political behavior
- Importance of monitoring mechanisms.

Responding to these issues, Mr. Shrestha said that the environment was essentially an overarching theme. He also drew the participants' attention to the possibility of meeting with paradoxical situations in environmental management. Mr. Shrestha further noted that what was at issue was how to reach a trade off that satisfied all stakeholders. In this connection, emphasis was placed on the need for concerted action on the part of all stakeholders, including consumers, academics and the mass media.

The chairperson remarked that not always do development and conservation go together. The challenge, therefore, was how to ensure the protection of the environment, while not obstructing the pace of development. The NPC Vice-Chairman also expressed the view that legislative provisions were generally adequate in Nepal; what was lacking was their proper implementation.

Session Two

The Role of Judiciary in Promoting and Enforcing Legal Norms in the Field of Sustainable Development

Summary of the Presentation

Mr. Uday Nepali Shrestha gave a presentation titled "The Role of Judiciary in Promoting and Enforcing Legal Norms in the Field of Sustainable Development". Mr. Shrestha said that Nepal had always complied with international call in good faith. He added, however, that the implementation of international treaties to which Nepal is a party had been very weak. It was noted that the Supreme Court plays a key role in (a) enforcing the right to healthy environment by integrating it into the right to life, (b) promoting citizen suits provisions through public-interest litigation even in the absence of specific legal regime, and (c) progressively interpreting and enforcing the right to information.

While environmental judicial activism was encouraging in some cases, Nepal was far behind India in this respect. The presentation reflected the view that the judiciary should (a) show activism in

protecting the environment, (b) put the 'onus of proof' on government agencies or industries, and (c) specify a time frame for fulfilling responsibilities while issuing directory orders. He also recommended that the judiciary should monitor whether the responsibilities specified in directory orders have been met or not.

The following issues were raised in light of this presentation:

- Overlapping of legal mandates
- Ill-defined jurisdiction
- The need for land use plans in order to avoid the tendency to complain about pollution as settlements grow around factories
- Difficulties arising out of the lack of prior scientific information on, or acceptable limits of, the effect of industrial emission or effluent
- Setting aside law courts' time rather than setting up a separate law court for the purposes of hearing environmental cases
- The need for enactment and executive action instead of judicial activism in ensuring the implementation of international conventions.

Session Three

Status of Environmental Law in South Asia

The presentation covered a wide range of issues relating to environmental law in general and environmental law in South Asia specifically. Describing law as an instrument of change, Mr. Lal Kurukulasuriya said that all countries of South Asia had put in place the legal and/or policy framework, as well as institutional set up for managing the environment. He further said that the general legislative provisions were also much the same in these countries. With regards to the approach to legislation, Mr. Kurukulasuriya noted that the 'command and control' type of procedure apparently guided almost all of these countries, laying down the do's and don'ts and what one would be liable for if one did not do the dos or did the don'ts instead.

Mr. Kurukulasuriya saw the environment as being central to the people's heart and pointed out the difficulties in legislating for environmental concerns in traditional fashion. The region is necessarily moving away from the command and control mechanism to more dialogue-oriented, environment-friendly procedure. Today, various stakeholders come together to decide what needs to be done.

The UNEP expert did not totally dismiss the old approach to environmental legislation, however. "The profit motive continues to drive the people to take short cuts and, therefore, we still need the safety net of the command and control mechanism," said Mr. Kurukulasuriya.

Stating that employment generation and economic development were the primary imperatives in all countries of South Asia, Mr. Kurukulasuriya drew the participants' attention to the possible costs of inaction as well.

The following issues were raised after the presentation:

- The position of SAARC vis-à-vis environmental protection?
- The implications of the Kuznet's curve?
- Are their efforts being made in the SAARC region with a view to reinforcing existing environment legislation?
- Does the law in different SAARC countries provide for educating the people at the local level?
- How can one ensure a proper balance between economic development and the protection of the environment?

It was noted that that there were some declarations if not conventions adopted by SAARC Ministers. Mr. Kurukulasuriya also gave the

example of SAARC Declaration on Transboundary Pollution, which was adopted by the SACEP Governing Council in the Maldives in April 1998. With reference to the Kuznet's curve, it was noted that the principle was to look into the environmental consequences of development activities at the very outset and take all measures that are necessary to minimize the possible damage on the environment, while maximizing the development function. He also stressed on never doing anything that can irreversibly affect nature.

As for the reinforcement of legislation, the meeting was advised to move step by step by addressing the imperatives of the present. Stating that every Act in the SAARC region had provided for creating public awareness about environmental issues, as well as for environmental education, he laid emphasis on the need for action within the established law. On balancing economic development and nature conservation, Mr. Kurukulasuriya was quite optimistic stating that every project can be carried out in a more environment-friendly way if the will to do so is present.

The meeting noted that the Constitution of the Kingdom of Nepal (1990) had directly provided for protecting the environment through the Directive Principles of the State. It was further noted that the Directive Principles were not legally binding on the State. He added, however, that courts, particularly the India Supreme Court, had, through 'judicial craftsmanship', declared that even the Directive Principles could be considered as fundamental duties of the State if not as fundamental rights of its citizenry.

Stating that environmental law was not a pure and simple law, as it essentially embodied scientific aspects, participants laid emphasis on the need for informing and helping the judiciary when hearing environment-related cases. Hon. Badri Bahadur Karki described the Environmental Protection Act (1997) as an umbrella Act and called for reviewing and updating all previous enactments in line with the Environment Protection Act (1997) and the Rules framed thereunder.

Session Four

Compliance and Enforcement: Application of Economic Instruments to Environmental Management

The presentation illustrated the limitations of economic assumptions as to individual rationality when extended to the case of the environment, viewed by economists as a composite asset. It was noted however, that economic rules still applied and economic instruments were being used for a number of reasons, including ease of administration and cost effectiveness. Observing that direct regulations, or the 'command and control' regulations, typically set environment standards and specify technology in case it is difficult to monitor performance Hon. Dr Jagadish Chandra Pokharel said that some form of direct regulation had invariably supported the use of economic instruments.

On the use of economic instruments in Nepal, the presenter said that Nepal had recently tried some in certain sectors. According to him, removal of subsidies on chemical fertilizers and pesticides, replacement of polluting vehicles with their clean substitutes and transfer of the ownership of forest to the concerned community were some examples. The presenter characterized the Environment Protection Act (1997) as being 'predominantly coercive', but said that there were certain provisions, such as those relating to emission charges and market permits, which aimed to influence one's behavior by enhancing one's willingness through tangible and intangible incentives.

The following issuing were raised after the presentation:

- Common property, which has a kind of management regime, should be distinguished from open-access property with no management regime.

- Adopting a disciplinary approach (such as the one based on economics) instead of a multi-disciplinary or a holistic approach to environmental policy analysis can be misleading.

- Alongside economic incentives, regulation, decentralization and participation should also form part of the approach to NRM.
- Research into the effects of economic instruments is also crucial.
- How are schools being assisted from EPF?
- Law can control nonconformist human actions, and not human behavior, which is the fundamental right of an individual.
- Is it possible to influence group behavior, too, through economic incentives?
- Aren't we taxing only good people by not introducing carbon tax?
- Carbon tax should be put on imported goods, too, or else domestic industries will be adversely affected.

It was generally agreed that there should be a holistic approach to the environmental policy analysis and that participation is a must. It was further noted that open-access property would be brought under the common property regime for the good of those who depend on it. Participation is essential even in the case of environmental impact assessment, which is generally considered to be an expert oriented process. Schools and colleges, too, should be provided with the EPF assistance.

2. On Specific International Conventions

Session One

UN Convention on Biological Diversity

Unlike other conventions, the UN Convention on Biological Diversity, which was signed by Nepal in the course of the 1992 Rio Summit, called for the utilization of biological resources on a sustainable basis, as well as their conservation. It was noted that Nepal had accorded priority to the implementation of the convention

and had taken various policy and legislative measures to protect biological diversity. In recent years, there had been a significant shift in Nepal's conservation policy, a shift from the idea of state-controlled protection to that of people-centered conservation.

The presenters, Dr Madhav Prasad Ghimire and Mr. Batu Krishna Uprety also pointed out that His Majesty's Government had prepared a draft National Biodiversity Action Plan in line with the convention. On the institutional side, the Ministry of Forest and Soil Conservation, and the Ministry of Agriculture were involved in conserving wild and domesticated species respectively. Furthermore, His Majesty's Government had, in July 1997, formed a National Biodiversity Steering Committee.

Over six thousand user groups were participating in the management of forest and wild biological diversity at the community level across the country. Stating that Nepal was rich in biological resources, Dr Ghimire and Mr. Uprety said, however, that deforestation, shifting cultivation and encroachment on natural forest areas had resulted in considerable loss of biological diversity in the country. "Some species may have been lost even before their ecological, economic and scientific importance is known," said the authors.

Increasing population, persistent poverty, uncaring sectoral development activities and failure to sufficiently empower the local custodians of species were some of the primary problems in protecting biological diversity in Nepal. The presentation expressed concern over the emphasis being laid on utilizing some highly valued agricultural species, which could increase the possibility of genetic erosion or transformation as hybrid varieties were developed. It was also pointed out those government organizations, NGOs and academics were still working in isolation. The presentation recommended exploring both wild and domesticated biological species, commercial or conservation farming of highly valued native plant and animal species, utilising the indigenous gene base, developing indigenous knowledge, expanding public awareness activities and institutionalising the benefit-sharing mechanism.

The following issues were raised after the presentation:

- Nepal has very good, and not just moderately competent, manpower; what is probably lacking in the will to act or the mechanism to facilitate action.
- The quality of biological diversity in protected areas needs to be studied.
- Ethnic diversity, grassland diversity and aquatic life should not be overlooked.
- Indigenous knowledge needs to be developed.
- Such essential elements of biological diversity as increased public participation, respect for human rights access to education and information, and greater institutional accountability are also crucial.
- The Ramsar convention should not be left out.
- Industrial pollution is posing threat to birds and wild animals in national parks, too.
- The unit of management should be the ecosystem rather than the administrative district
- How is the implementation of policy or law being monitored?
- As alien species can destroy the whole ecosystem, it is high time that we recorded all alien species.

Session Two

UN Framework Convention on Climate Change

The UN Framework Convention on Climate Change was opened for signature at UNCED, 1992. Nepal signed the convention during the conference and ratified it on 2 May 1994. With a cursory review of the developments proceeding and subsequent to the adoption of the convention, Professor Bidur Prasad Upadhyay spoke about the appalling effects of global climate change in Nepal, as elsewhere. He then assessed the existing legislative provisions as well as institutional framework designed to respond to this threat. Based on an IPCC report published in 1990, Professor Upadhyay noted that the concentration of green house gases would double in 2025 as compared to the pre-industrial level, leading to an increase in global temperature by about 0.3 degree per decade.

Studies on the variation in surface air temperature in Nepal had found the same rising by 0.1 to 0.18 degree per year in all regions except the Terai. Furthermore, the negative glacier mass balance and the expansion of glacier lakes, as observed in recent years, could be attributed to global warming. This can have serious effects on Glico-hydrological regimes and Nepal's water resources. The glacier recession implies that less and less ice will be available for the river in future.

All available data showed Nepal's contribution to global warming is negligible. He also indicated the problem of incoming pollutants in Nepal and, citing scientific sources, said that around 40 per cent of the pollutants found in Kathmandu actually came from outside the valley. It was recommended that a Pollution Control Board, with the authority to license the discharge of environmental contaminants, be established under the Ministry of Population and Environment.

The following issues were raised after the presentation:

- Which sector, the green or the brown, is more responsible for greenhouse gases in Nepal?

- Efforts should be made to establish a common state-of-the-art environmental laboratory at the regional level.

- Is the frequent flooding in Bangladesh primarily due to deforestation in Nepal or due to some other reasons?

- What measures can be taken to halt the thinning of glaciers?

- Do we have sufficient data to support the conclusion that we are suffering from alien pollutants as well?

- Can the current problem of haze in Kathmandu be attributed to air pollution?

- How long will it be before our glaciers dry out?

- Some of the participants also expressed their concern over the little or no progress being made in actually reducing greenhouse gases.

The session agreed that more study was needed on the cause of the current problem of haze in Kathmandu valley and stressed on the need for regional cooperation in dealing with environmental problems.

Session Three

Montreal Protocol on Substances That Deplete the Ozone Layer

Dr Sita Ram Joshi, Senior Divisional Engineer, NBSM stated that the protocol provided for the cessation of the consumption of CFCs, halons, methyl chloroform and carbon tetrachloride in developed countries by 1995 and in developing countries. There is a great opportunity to further regional co-operation in South Asian countries by 2010. For the purposes of the protocol, developing countries are defined as those, which use less than 0.3 kg of ODSs per capita per

year. A survey of ODS consumption in Nepal found that 29 tons of CFC-12 and 23 tons of HCFC-22 were consumed in Nepal in 1996. Nepal's current consumption of CFCs is 0.0013 kg per capita, making the country eligible for assistance from the multilateral fund created as envisaged in the protocol.

With a view to reducing CFC consumption to zero by 2010, a country action program had been worked out based on such elements as sending economic signals to the market by putting additional taxes on CFC products, creation of consumer and industrial awareness and restrictions and banning of CFC imports. However, there is a lack of awareness about the ozone problem in Nepal, as elsewhere is many developing countries. There is a need for strengthening the existing institutional capabilities, introduction of control measures and close monitoring of the progress in phasing out ODSs. The Montreal Protocol was adopted in September 1987. Nepal ratified it on 6 July 1994. The original protocol was amended twice - in London in 1990 and in Copenhagen in 1992. Nepal is yet to ratify the Copenhagen amendment to the protocol.

The following issues were raised after the presentation:

- As the masses, and not merely scientists or academics, can change the environment, creating consumer awareness should be a priority.
- Ozone-friendly technology should be promoted.
- Industries that operate within the intended system [or which avoid ODSs in the first place] should be provided with certain incentives to do so.
- Also important are punitive measures.
- Regional co-operation is essential.
- An information bank on ODS would be useful
- Is there a relation between recent outbreaks of diseases, such as viral influenza, and the thinning of the ozone layer?

Session Four

Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal

The 1989 Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (commonly known as the Basel Convention) was the first international attempt to deal with the problem of hazardous waste. The convention, which was ratified by Nepal in 1994, provides for the disposal of hazardous waste in the country of its origin as far as possible, and also for forbidding cross-border transport of such waste except under specified conditions. The convention also recognises the need for assisting developing countries by way of technology transfer or otherwise in managing hazardous waste in environmentally sound fashion.

The solid waste (Management and Resource Mobilisation) Act (1987) was the first Act in Nepal to refer to hazardous waste, and prohibit its storage, dumping or improper disposal at any public or private place. More recently, the Environment Protection Rules (1997) have made EIA mandatory for industries, which produce hazardous waste or facilities, which are intended to manage such waste. EIA is compulsory under the Rules in the case of facilities generating or handling lethal waste, including infectious biological waste.

The presentation was critical of the inconsistent approach to fulfilling the obligations under international conventions. The Environment Protection Act (1997) has not been effectively enforced is as much as no specific legal initiative was being taken in implementing the Basel Convention. The presentation recommended amendments to existing laws, as well as a separate enactment dealing with hazardous waste, enforcement mechanisms, effective monitoring and information sharing, among other things.

The following issues were raised after the presentation:

- Consolidating all legal provisions relating to the convention.

- Creating an additional agency for overseeing the implementation of the convention.
- They were interested in knowing about the following:
- How has the Basel Convention provided for handling or disposing of such types of waste as used motor oil and other petroleum products?
- Is their any international law governing the implementation of international conventions?
- Does the Basel Convention cover the disposal of municipal waste, which is often disposed of out of the municipal area?
- And they agreed on the following:
- The implementation of the convention needs to be made more effective.
- Institutional capacity needs to be developed.

Support was expressed for the formation of 'joint agency', rather than a new one, to effectively oversee the implementation of the convention. Furthermore, it was expressed that while there was a gap in the implementation of international conventions, including the Basel Convention, it was not too late to develop institutional capabilities and initiate action.

Session Five

UN Convention to Combat Desertification

Desertification is basically a process of land degradation. Soil erosion, flooding and water logging are the three major types of land degradation identified in Nepal. Although there is no precise measure of the extent of desertification in the country, an old inventory of Nepal's watershed conditions indicated that roughly 10,000 sq km (7 per cent of the land area) was in the process of desertification. Some experts had estimated that every year, topsoil in the area of 20-100m tons was being removed from the country's poorly managed land. Although the magnitude is not known, there

is evidence of a direct relation between deforestation and desertification in Nepal.

The Fifth Five-year Plan (1975-80) was the first plan to recognize the problem of land degradation in the country. DOSCWM had launched mitigation programs in 55 of the 75 districts of the kingdom however; this anti-desertification policy has not been effective due to the lack of legislation. The only law directly related to the problem of land degradation or desertification - the Soil and Watershed Conservation Act (1982) - had not been put into practice except in the Shivapuri Watershed for many reasons, including the lack of political support.

There is a need for making inventory, strengthening research centers, mobilizing community action, developing indigenous technology and amending the Soil and Watershed Conservation Act (1982). The UN Convention to Combat Desertification entered into force on 13 January 1997. Nepal ratified it in September 1996.

The following issues were raised after the presentation:

- Desertification should be recognized as a serious national problem and, accordingly, anti desertification programs should be given top priority while allocating resources.
- Coordinated action is essential to fight desertification, as the problem is multidimensional in nature
- Attention should be paid to proper utilization of the available specialists.
- Why isn't the protection of the watershed a viable option?
- Will it be desirable to entrust DOSCWM with additional responsibilities under the law at a time when it is already overloaded?
- What consultative mechanisms have been put in place to obtain inputs from various agencies and the people into the current legislative reform process?

Proposed Convention on the Management of Persistent Organic Pollutants

Persistent organic pollutants are hazardous chemicals that resist photolytic, biological and chemical degradation. The UNEP Governing Council has identified 12 POPs (DDT, aldrin, dieldrin, chlordane, endrin, heptachlor, hexachlorobenze, mirex, PCB, dioxins and furans), sometimes referred to as the dirty dozen. DDT and other chlorinated pesticides are being used in South Asia for controlling plant pests and vectorborn diseases like malaria and kaalajar - in India since the late 1940s and elsewhere in the region since the early 1950s.

Nepal continued to receive DDT under a USAID - assisted malaria eradication program until the 1980s; nearly a decade after the chemical was banned in the United States. Both DDT and BHC were being imported in Nepal as late as 1997. Citing a NFRL report, Mr. Pushpa Raj Shrestha said that DDT residues in cereals, vegetables, meat, milk, fish and oilseeds were found well above the WHO acceptable level. Nepal's most visible problem continues to be how to safely dispose of obsolete pesticides.

In 1990, the stock of date-expired pesticides was around 146m tons. By 1992, nearly 74m tons of such pesticides were buried or spread over the ground, 16m tons were reused and 23m tons were reformulated with the technical assistance of ANZDEC Ltd, an Australian company hired by ADB and ISNDP. An ADB review of the way of disposing of these pesticides revealed that the Amlekhgunj burial was a public health disaster. Furthermore, an attempt to burn 19m tons of such pesticides in a heated cement factory was vehemently opposed by the local people and environmental activists.

According to Mr. Shrestha, the current stockpile of obsolete organo-chlorine pesticides is 35m tons, stored in AIC warehouses scattered throughout the country. Concerning the efforts being made by the government to grapple with the problem of POPs in Nepal, Mr.

Shrestha mentioned the Pesticide Act (1991), which, *inter alia,* provides for the banning of the pesticides belonging to WHO class IA and the 12 POPs, as well as the registration of all pesticides. The Environment Protection Act (1997) has made EIA or IEE mandatory in the case of production or import of chemicals, and the Industrial Hazardous Waste Management Policy, was worked out in 1994 but is yet to be put into practice.

The tasks ahead included making inventories of the source, release and sinks of POPs, devising appropriate regulatory measures, providing industries and agriculturists with information on environment-friendly technology, campaigning for informed use of pesticides, and pursuing policies of doing away with POPs.

The following issues were raised after the presentation:

- Agricultural extension workers continue to recommend the use of pesticides; they should
- Give priority to integrated pest management.
- The acceptable standards [of pop residues] should be known [to all].
- What types of economic instruments would be effective in phasing out POPs?
- All responsible agencies should work together.
- There is apparently a behavioral, and not a structural, problem in bringing about proper
- Institutional coordination.

Mr. Shrestha expressed the opinion that perhaps the Plant Protection Officer did not give priority to avoiding pesticide. He added that retailers were selling DDT, BHC and aldrin even today. The policy of subsidizing pesticide and that of phasing out the same are contradictory.

It was stated that Agenda 21 included the phasing out of POPs, but the details of the proposed convention on POPs are currently under deliberation. There is a need for changing the technology of production, as well as creating public awareness about the harmful effects of POPs.

Session Seven

Proposed Convention on Prior-informed Consent

The proposed Convention on Prior-informed Consent seeks to forbid the export or import of the listed chemicals or pesticide formulations from or to a country of which is not a party to the convention, facilitate exchange of information on them and promote technical co-operation in managing such chemicals or pesticide formulations. This convention seeks to safeguard human life and the environment against the improper use of hazardous chemicals or pesticides, adding that 22 pesticides, including aldrin, DDT and dieldrin, and 5 industrial chemicals, such as parathion and crocidolite, were included in the initial list. The proposed convention is a product of UNCED (1992), which recognised the need for ensuring sound management of chemicals and called for the implementation of the PIC procedure, including possible mandatory application of the voluntary procedures contained in the amended UNEP London Guidelines for chemicals and the FAO International Code of Conduct for pesticides.

The PIC procedure was included in two other international conventions - the Basel Convention and the Convention on Biological Diversity. The draft convention was adopted in September 1998 and those 61 countries signed it in the first place. It will remain open for signature until 10 September 1999 and will enter into force 90 days after receipt of the 50th instrument of ratification.

Nepal has no clear regulations governing the import of hazardous chemicals, and the MOH controls on certain types of chemical, such as strong acids, anhydrides and organic solvents, were imposed for security reason rather than because of their possible effect on human health or the environment. Concerning pesticide, the Pesticide Act (1991) provided for regulating the import or the distribution of pesticide. However, many pesticides subject to the PIC procedure are freely available and used in the country.

The following issues were raised after the presentation:

- Considering the difficulty in controlling pesticide, emphasis should be laid on creating public awareness about its harmful effects.
- Given the possibility of crossborder movements of hazardous chemicals or pesticides, it is imperative for us to promote regional cooperation in dealing with this problem.
- Law alone is not sufficient.
- Safety measures should be prescribed in order that the chances of chemical disasters are minimized.
- All the related institutions should work in coordinated fashion. In addition, institutional capacity should be developed further.
- Some of the participants sought additional information on the following:
- To which categories do the 5 chemicals allowed to be imported in Nepal belong?
- Isn't the disposal of hospital waste a problem in Nepal?
- What could be the practical solution to the problem of pesticide? Has the [proposed] convention addressed this?
- Will a party to the [proposed] convention be free to produce the listed chemicals domestically?
- What is the recourse to a third country affected by the decision of importing and exporting countries?
- Does the [proposed] convention provide for changing the decision of a party as to the import of the listed chemicals?

In response to some of these issues, it was noted that some of the chemicals, which were allowed to be imported in Nepal, were considered as hazardous waste under the WHO guidelines. It was opined that the exporting country should take back the chemicals

that were dumped in a developing country, as the former has the capacity to safely dispose of them.

Building public awareness about hazardous chemicals or pesticides was essential. The proposed convention provides for technical co-operation, thus monitoring of such chemicals or pesticides is important. There is also a need for institutional co-ordination and the Ministry of Population and Environment has a role to play in this process.

Conclusions and Recommendations

The following are the conclusions and recommendations of the meeting:

1. Contentious Issues

a) The approach to management: sectoral or holistic
b) The approach to legislation: command-oriented or dialogue-oriented
c) The perspective: national or regional
d) Institution building: creating new institutions or strengthening old ones
e) The role of judiciary: active or secondary
f) Law courts for hearing environment-related cases: regular or special
g) Economic valuation of natural resources: worthwhile or not
h) Environmental impact assessment: a safeguard against environmental degradation or a tax on industrial development.

2. Common Concerns

a) Gaps in implementing policy
b) Participation of stakeholders, including the academia
c) Institutional linkages
d) Scientific evidence and analytical capabilities
e) Sharing of the information resource
f) Public awareness
g) Decentralization
h) Review of the existing Acts and Rules
i) Prior assessment of the country's capacity as well as legal provisions
j) National action plans
k) Accountability.

3. Future Courses of Action

(a) *General*

- The Ministry of Population and Environment should play the role of a leading agency in formulating policies, co-ordinating the efforts of sectoral agencies and in monitoring the progress in the domain of environmental management.

- Environment-related activities of line agencies, NGOs, academic institutions and private businesses should be identified, and their roles, responsibilities and procedures defined in relation to the Ministry of Population and Environment.

- The concerned ministry and ambient standards by the Ministry of Population and Environment in consultation with each other should set location-specific or industry-specific pollution standards.

- The Ministry of Population and Environment should take the initiative in integrating environment-related programs of all sectors, as well as assisting line agencies in formulating sectoral programs.
- Institutional capacity, including that of the Ministry of Population and Environment, should be strengthened.

- Environmental policy should be resource-oriented rather than use-oriented.

- Rules and regulations should be reviewed and revised so as to facilitate participation, consensus building and the application of economic instruments to environment protection.

- Wherever practical, effects on natural resources should be considered in economic terms as well.

- Stakeholders' meetings should be held on a regular basis including the views of NGOs, including professional organizations, and academics

- The accountability for the management of the environment should be clearly specified at appropriate levels.

- Base-line studies as well as basic research into different aspects of the environment should be encouraged.

- State-of-the-art environmental laboratories and information centers should be established in the country. In addition, emphasis should be laid on creating databases and institutionalizing information exchange systems.

- Communication campaigns should be launched with a view to building public awareness about environmental issues.

- Priority should be given to making full use of national professional capabilities.

- The government should promote clean production.

- Environment cells should be created in all related ministries so as to facilitate more effective integration of environmental concerns into sectoral development programs.

- The possibility of arranging for separate bench hearing of environment-related cases should be explored.

- Proper mechanisms for assessing the national capacity as well as legal provisions in advance of being a party to an international convention should be instituted.

- A national action plan, with clearly defined roles of all related agencies, should be drawn up with respect to every international convention, which has already been ratified by Nepal.

(b) Convention-specific

i) UN Convention on Biological Diversity

- The ecosystem, with natural boundaries, should be considered as a management unit for the purposes of protecting biological diversity.
- Commercial or conservation farming of highly valued native plant or animal species should be encouraged.
- Benefit-sharing mechanisms should be institutionalized.
- Concern for biological diversity should form part of the decision-making process.
- Legislation on agricultural biodiversity should be enacted.

ii) UN Convention to Combat Desertification

- A broad-based anti-desertification master plan should be prepared as part of the national strategic response to the threat of desertification.
- Present policy and legislation should be reviewed having regard to the provisions of the convention. Besides, guidelines on land use and conservation of watersheds should be laid down.
- Adequate resources should be mobilized to check the process of desertification in various ways.

- All programmes should be properly co-ordinated and overlapping of agency functions avoided.

iii) UN Framework Convention on Climate Change and Montreal Protocol

- Overall national policy on climate change should be formulated in line with the provisions of the UN convention.
- The Nepal Bureau of Standards and Metrology should, in consultation with the Ministry of Population and Environment, co-ordinate the efforts of all the concerned agencies to phase out ODSs.

iv) Basel Convention and (Proposed) Conventions on PIC and POPs

- Existing regulations should be reviewed in light of the provisions (or proposed provisions) of these conventions.
- Scientific information on hazardous waste and POPs, including the extent of their uncaring use and POP residues in food, should be acquired by means of research.

Agenda

MOPE/SACEP/UNEP/NORAD Workshop on Environmental Law and Management, March 30 – April 2, 1999

Venue: Blue Star Hotel, Kathmandu, Nepal

First Day March 30, 1999

Opening Session

10:30 - 11:00:	Registration for Participants
11:00 - 11:05:	Arrival of Chief Guest Rt. Hon. Chief Justice Mohan Prasad Sharma, Supreme Court Chairperson Hon. Minister Ramesh Nath Pandey Ministry of Population and Environment
11:05 - 11:15:	Welcome Speech Mr. Varun Prasad Shrestha, Secretary, MOPE
11:15 - 11:25:	Address by Mr. Lal Kurukulasuriya Chief, Regional Environmental Law Programme, UNEP - ROAP
11:25 - 11:35:	Address by Dr. Ananda Raj Joshi, Director General, SACEP
11:35 - 11:45:	Address by Hon. Vice Chairman Prithvi Raj Ligal, NPC
11:45 - 11:55:	Opening Address by the Chief Guest Rt. Hon. Chief Justice Mohan Prasad Sharma, Supreme Court

11:55 - 12:05: Address by the Chairperson
Hon. Minister Ramesh Nath Pandey
Ministry of Population and Environment

12:05 - 12:15: Vote of Thanks
Dr. Madhav Prasad Ghimire
Joint Secretary and Chief of Environment
Division, MOPE

12:15 - 12:30: Refreshment

First Day: March 30, 1999

Technical Sessions

Session I

12:30 - 13:30: Existing Environmental Policies and Institutional Structures

Chairperson
Hon. Vice Chairman Prithivi Raj Ligal, NPC

Writer
Mr. Varun Prasad Shrestha, Secretary, MOPE

12:30 - 13:00: Paper presentation
13:00 - 13:20: Discussion
13:20 - 13:30: Chairperson's remarks

13:30 - 14:30: Lunch

Session II

14:30 - 15:30: Role of Judiciary in Promoting the Development and Enforcement of Legal Norms in the field of Sustainable Development

Chairperson
Hon. Attorney General Badri Bahadur Karki

Writer
Udaya Nepali Shrestha, Special Secretary,
Ministry of Law and Justice

14:30 - 15:00: Paper presentation
15:00 - 15:20: Discussion
15:20 - 15:30: Chairperson's remarks

Session III

15:30 - 16:30: Environmental Law Status in South-Asian Region

Chairperson
Hon. Attorney General Badri Bahadur Karki

Writer
Mr. Lal Kurukulasuriya
Chief, Regional Environmental Law
Programme, UNEP-ROAP

15:30 - 16:00: Paper presentation
16:00 - 16:20: Discussion
16:20 - 16:30: Chairperson's remarks

16:30 - 16:45: Tea/Snacks

Second Day: March 31, 1999

10:30 - 16:45: Recent Development relating to the implementation of the following with special reference to national legal and institutional measures required for their implementation at National level

Session IV

10:30 - 11:45: United Nations Framework Convention on Climate Change

Chairperson
Dr. Daya Nanda Bajracharya, VC, RONAST

Writer
Dr. Bidur Prasad Upadhayay, Chairman
Meteorology Department, Tribhuwan University

10:30 - 11:00: Paper presentation
11:00 - 11:35: Discussion
11:35 - 11:45: Chairperson's remarks

11:45 - 13:00: Montreal Protocol

Chairperson
Dr. Daya Nanda Bajracharya, VC, RONAST

Writer
Dr. Sita Ram Joshi, S.D.E., Bureau of Standards

11:45 - 12:15: Paper presentation
12:15 - 12:50: Discussion
12:50 - 13:00: Chairperson's remarks

13:00 - 14:00: Lunch

Session V

14:00 - 15:15: United Nations Convention on Biological Diversity

Chairperson
Mr. Lal Kurukulasuriya
Chief, Regional Environmental Law Programme,
UNEP - ROAP

Writer
Dr. Madhav Prasad Ghimire/Mr. Batu Upreti

14:00 - 14:30: Paper presentation
14:30 - 15:05: Discussion
15:05 - 15:15: Chairperson's remarks

15:15 - 15:30: Tea/Snacks

15:30 - 16:45: United Nations Convention to Combat desertification

Chairperson
Mr. Lal Kurukulasuriya
Chief, Regional Environmental Law Program, UNEP - ROAP

Writer
Mr. Mohan Wagley, Director General, Department of Soil Conservation

15:30 - 16:00: Paper presentation
16:00 - 16:35: Discussion
16:35 - 16:45: Chairperson's remarks

Third Day: April 1, 1999

10:30 - 13:00: The Emerging Legal Regime relating to Prior Informed Consent Convention, Management of Persistent Organic Pollutants (POPs) and Basel Convention

Session VI

10:30 - 11:45: Prior Informed Consent Convention

Chairperson
Dr. Ananda Raj Joshi, Director General, SACEP

Writer
Dr. Uttam Kunwar, Chemist, Bureau of Standards

10:30 - 11:00: Paper presentation
11:00 - 11:35: Discussion
11:35 - 11:45: Chairperson's remarks

11:45 - 13:00: Management of POPs

Chairperson
Dr. Ananda Raj Joshi, Director General, SACEP

Writer
Mr. Pushpa Raj Shrestha, Senior Chemist,
Bureau of Standards

11:45 - 12:15: Paper presentation
12:15 - 12:50: Discussion
12:50 - 13:00: Chairperson's remarks

13:00 - 14:00: Lunch

Session VII

14:00 - 15:15: Basel Convention

Chairperson
Mr. Lal Kurukulasuriya
Chief, Regional Environmental Law Programme,
UNEP - ROAP

Writer
Mr. Ashok Tuladhar, Advisor, Pokhara
Municipality

14:00 - 14:30: Paper presentation
14:30 - 15:05: Discussion
15:05 - 15:15: Chairperson's remarks

15:15 - 15:30: Tea/Snacks

Session VIII

15:30 - 17:00: New Approaches for Promoting Compliance and Enforcement and Application of Economic Instruments thereto

Chairperson
Mr. Lal Kurukulasuriya
Chief, Regional Environmental Law Programme, UNEP - ROAP

Writer
Hon. Member Dr. Jagadish Chandra Pokharel
National Planning Commission

15:30 - 16:00: Paper presentation
16:00 - 16:35: Discussion
16:35 - 16:45: Chairperson's remarks

Fourth Day: April 2, 1999

Session IX

10:30 - 13:00: Group division

Group A -
Environmental Policy and Convention
Group B -
Role of Judiciary in Environmental Management

13:00 - 14:00: Lunch

14:00 - 15:00: Group-work continues; Preparation for presentation

15:00 - 15:15: Tea/Snacks

Session X

15:15 - 17:00:	Group presentation, clarification and closing
	Chairperson Mr. Varun Prasad Shrestha, Secretary Ministry of Population and Environment
15:15 - 15:55:	Presentation (20 minutes for each group)
15:55 - 16:30:	Clarification
16:30 - 16:40:	Remarks by SACEP/UNEP/NORAD
16:40 - 16:50:	Remarks on behalf of the participants
16:50 - 17:00:	Closing Remarks by Chairman
17:00 - 19:00:	Reception/Dinner by MOPE/SACEP/UNEP/NORAD

List of Participants

Mr. Amar Bahadur Manandhar
Under Secretary
Ministry of Industry

Mr. Anil Shankar Giri
Auto Mobile Engineer
RONAST

Mr. Bal Prasad Shrestha
Joint Secretary
Ministry of Finance

Mr. Basant Kumar Rimal
Department of Soil Conservation and Watershed Management

Mr. Basu Dev Newpane
Section Officer
Ministry of Law and Justice

Mr. Bikram Khadka
Under Secretary
Department of Hydrology and Meteorology

Mr. Bishal Khannal
Deputy Registrar
Supreme Court

Mr. Brajesh Pyakurel
Under Secretary
Office of the Attorney General

Mr. Chiranjivi Lal Shrestha
Chairman
Group for Environment Management (GEM/Nepal)

Ms. Devi Maya Sharma Ghimire
Section Officer
Ministry of Population and Environment

Mr. Dili Bahadur Singh
Senior Division Engineer
Ministry of Water Resources

Mr. Gopal Prasad Upadhaya
Under Secretary
Department of National Park and Wild Life Conservation

Mr. Hara Bhattarai
Under Secretary
Ministry of Population and Environment

Mr. Hari Sharan Shrestha
Under Secretary
Ministry of Population and Environment

Mr. Jalpa Pradhan
Member Secretary
ABC Nepal

Mr. Keshav Prasad Bhandari
Senior Officer
National Productivity and Economic Development Center

Mr. Kiran Karki
Section Officer
Ministry of Population and Environment

Mr. Komal Raj Arayal
Environmental Research Officer
Leaders Inc.

Mr. Krishna Hari Baskota
Joint Secretary
Ministry of Population and Environment

Mr. Vidhan Ratna Yami
Under Secretary
Ministry of Housing and Physical Planning

Mr. Lok Nath Paudel
Section Officer
Ministry of Population and Environment

Dr. Madav Prasad Ghimire
Joint Secretary
Ministry of Population and Environment

Mr. Madhav Gadtaula
Section Officer
Ministry of Population and Environment

Dr. Mahesh Baskota
Deputy Director
ICIMOD

Mr. Mahesh Raj Sharma
Under Secretary
Ministry of Local Development

Ms. Moti Shova Shrestha
Under Secretary
Ministry of Population and Environment

Mr. Prakash Chandra Adhikari
Law Officer
Ministry of Population and Environment

Mr. Prakesh Sayami
Forest Officer
Department of Forestry

Mr. Pratap Kumar Pathak
Joint Secretary
Ministry of Agriculture

Mr. Lila Bahadur Basnet
Joint Secretary
Nepal Law Recommendation Commission

Mr. Purusottam Kunwar
Under Secretary
Ministry of Population and Environment

Mr. Sanjay Nath Khanal
Kathmandu University

Mr. Sharad Upadhaya
Account Officer,
Account Section
Ministry of Population and Environment

Mr. Sher Jung Karki
Legal Officer
Ministry of Population and Environment

Mr. ShriGopal Jha
Under Secretary
Ministry of Forest and Soil Conservation

Mr. Sushil Koirala
Law Officer
Ministry of Health

Mr. Tika Datta Niraula
Joint Secretary
National Planning Commission

Mr. Tirtha Prasad Ligal
Under Secretary
Ministry of Population and Environment

Mr. Upendra Prasad Adhikari
Under Secretary,
Population Policy Section
Ministry of Population and Environment

Chairman of the Sessions

Dr. Ananda Raj Joshi
Director General
SACEP

Mr. Lal Kurukulasuriya
Chief, Regional Environmental Law Program
UNEP/ROAP

Mr. Badri Bahadur Karki
Hon. Attorney General
Attorney General Office

Mr. Prithivi Raj Legal
Hon. Vice Chairman
NPC

Dr. Daya Nanda Bajracharaya
Vice Chairman
RONAST

Mr. Varun Prasad Shrestha
Secretary
MOPE

SACEP

Dr. Ananda Raj Joshi
Director General

Mr. Prasantha Dias Abeyegunawardene
Deputy Director, Program

Mr. Marlene Pereira
Deputy Director, Administration

UNEP

Mr. Lal Kurukulasuriya
Chief, Regional Environmental Law Program

Rapporteurs

Mr. Kehsab Prasad Regmi
Mr. Mukunda Adhikari

Observers

Ms. Sushila Maharjan
ADB Project
Ministry of Population and Environment

Dr. Bimala Shrestha
Member
Environment Protection Council

Workshop Papers

Session I

Existing Environment Policies and Institutional Structures Overview of the National and Regional Environment and Development Issues

Varun Prasad Shrestha
Secretary,
MOPE

Environment Assessment

Nepal occupies almost a central segment of the Himalayas, the young mountain with variable physiographic features and the Indus-Gangetic-Brahmaputra plain may be taken as the interrelated macro-ecoprovince irrespective of political boundaries. The Glaciers of the plateaus and the rivers rising at the high mountain as well as the soil formed out of the weathering process of the fragile terrain nourish the flat land and plain provinces. There are thus the highland and lowland relationships from time immemorial in the development of culture, ethnic migration, trade and economic exchanges. The commonly prevailing environment scenario in Nepal is made up of degradation of resources impoverishing potentiality of life support systems; population growth building up pressure on land, beyond the range of its carrying capacity; recurrence of natural calamities bringing hunger, poverty and weak applications; and, notable failings to capitalise national savings and indigenous expertise for resource management, industrial leadership and for sustainable economic growth.

Much of the ecological degradation in the rural areas is associated with poverty, with a decline in average agricultural productivity, and with the lack of alternative energy resources. Rural economic development has been sparse and slow, paying little or no attention to the protection, conservation and wise use of natural resources. In urban areas and growth market centers, unplanned urban development and ad hoc industrial growth have led to deterioration in the quality of air, water and land and increasing noise levels.

Environment damages in Nepal can be categorized in areas of soil erosions, land degradations and loss of bio diversities. Heavy environmental stress has mounted on urban centers causing pollution on air, water, land, solid waste management and consumption such as water and foods.

Environment Management

By the provision of Constitution of Nepal, 1990, it is now the state policy to give priority to the protection, preservation and development of environment. It is clearly stated "The state shall give priority to the protection of the environment and also to the prevention of its further damage due to physical development activities by increasing awareness of the general public about environmental cleanliness and the state shall also make arrangements for the special protection of the rare wildlife, the forests and the vegetation".

The National Conservation Strategy (NCS) for Nepal has developed the modest conceptual framework with plan of action "to strike a balance between the needs of growing population and those of nature conservation" (HMG 1990)

From the beginning of Ninth Five-Year plan (1997-2002). HMG/N has initiated integrated approach to interlink among poverty alleviation, population growth and environment - identified as these critical issues of the Nepalese economy - with agriculture and water resources playing the major role in economic development with improvements in environment.

Existing Policy Strategy and Legal Framework

The National Conservation Strategy for Nepal (NCS)

The National Conservation Strategy (NCS) for Nepal was prepared by IUCN-The World Conservation Union and theoretically approved by His Majesty's Government of Nepal on 1988. NCS is the first major step to systematically develop an appropriate strategy for

environment and resource conservation in Nepal. NCS links material, cultural and spiritual of human needs with four elements of conservation: wise use, protection, preservation and restoration. The Strategy emphasizes 4 objectives as follows:

1. Satisfy the basic material, spiritual and cultural needs of the people of Nepal, both present and future generations.
2. Ensure the sustainable use of Nepal's land and renewable resources.
3. Preserve the biological diversity of Nepal in order to maintain and improve the variety of yields and the quality of crops and livestock and to maintain the variety of wild species, both plant and animal.
4. Maintain essential ecological and life-support systems, such as soil regeneration, nutrient recycling and the protection and cleaning of water and air.

Nepal Environmental Policy and Action Plan (NEPAP)

During the Eighth Plan period Nepal Environmental Policy and Action Plan (NEPAP) has been prepared as part of HMG's continuing efforts to incorporate environmental concerns into the country's development process. The Environment Protection Council endorsed it in 1993. There are five main aims of environmental policy:

a) To manage efficiently and sustainable natural and physical resources,
b) To balance development efforts and environmental conservation for sustainable fulfillment of the basic needs of the people,
c) To safeguard national heritage,
d) To mitigate the adverse environmental impacts of development projects and human actions, and,
e) To integrate environment and development through appropriate institutions, adequate legislation and economic incentives, and sufficient public resources.

The NEPAP analyses the country's environmental issues in a multi-sectoral framework and sets forth policies, strategies and action plans for maintaining the country's natural environment, the health and safety of its population and its cultural heritage as economic development occurs.

NEPAP phase II also has been prepared and published recently. It develops detailed programs, including investments on forestry, water resources and industry.

Ninth plan (1997-2002)

The preparation of the Ninth Plan was guided by the philosophy: development for people, with the people and by the people. People occupy the central place in the plan. The Ninth Plan has the main objective of poverty alleviation and has prioritized agriculture, industrialization and tourism development. Environment management has been further re-emphasized as a national level policy, and the sectoral policies also include several strategies, which could contribute to improve the environmental conditions. Some important policies on Environment and Natural Resource Management of the Ninth Plan are as follows:

a) Major projects will be required to have an Environment Impact Assessment (EIA) before they are approved.
b) All development projects including local level projects will take environment into consideration during their design and implementation.
c) Incentives will be provided to local institutions, community, NGOs & private sectors that voluntarily promote and practice environmental conservation measures.
d) Custom, Tax and Investment Policies will be investigated in context of Environment Policy.

Legal Framework

In Nepal, there are more than forty legislative enactment which are directly or indirectly related to the environment, but the irony is that not a single legislative enactment deals with eco-management

in its entirely. Most of the Acts are use-oriented rather than resource-oriented.

Lists of some of the relevant Acts are as follows:

1. The Constitution of the Kingdom of Nepal, 2047 BS (1990), makes it a duty for the state to incorporate environmental matter into its policy process. Articles 24(4) proclaims: "The state shall give priority to the protection of the environment and also to the prevention of its further damage due to physical development activities by increasing the awareness of the general public about environmental cleanliness, and the state shall also make arrangements for the special protection of the rare wildlife, the forests and the vegetation." Article 126 (2d) States that any treaty or agreement with regard to natural resources, and the distribution of their uses, shall have to be approved by a majority of two-third of the members present at a joint sitting of both Houses of Parliament
(Art, 126, 2(d)

2. The Town Development Act, 1988 empowers the Town Development Board to issue public notification to control or prohibit actions that pollute the environment (Art. 9).

3. The Civil Aviation Act 2015 (1958) contains a provision to control the noise level of the aircraft and to prevent atmospheric pollution (Art. 3 (2)

4. Labour Act, 1991 states that the working environment must have adequate ventilation and lighting arrangements and if any emission of gas, dirt or other pollutants is bound to occur in the course of operation, necessary arrangements are to be made so that they do not accumulate in the working place (Art. 27).

5. The Aquatic Animals Protection Act, 2017 (1961) has forbidden the use of explosives and poisonous substances

in water for killing animals with the objective of protecting aquatic animals (Art. 3).

6. Public Roads Act, 1974 directs the state to maintain environmental amenity, and the Department of Roads is required to plant trees among all public roads (Art. 16).

7. Mines and Minerals Act, 1985 have made provisions for prohibiting the use of gases that may cause atmospheric pollution.

8. The Urban Construction Plan Implementation Act, 2019 (1972) prohibits any activities Act, 2019 (1972) prohibits any activities that may impair the natural beauty, touristic significance, scenery and public health or cause atmospheric pollution in any other way in the urban area.

9. His Majesty King Mahendra Trust for Nature Conservation Act, 1982 aims to protect natural resources against damage.

10. The Tourism Act, 2035 (1978) has made it mandatory for mountaineers to keep the atmosphere clean and abide by the specified conditions (Art. 30)

11. The Soil Conservation and Watershed Management Act, 2039 (1982) has laid down provisions for the proper protections and utilization of land, natural resources and watersheds.

12. The Pesticides Act, 1991 contains provisions regarding import, export, production and consumption of pesticides for which government clearance is compulsory.

13. The Solid waste (Management and resource mobilization) Act 2044 (1986) includes arranging pollution, Free disposal of solid waste in the functions, duties and powers of the solid waste management and Resource Mobilization Centre. The Centre is empowered to take necessary measures to stop

air, water and soil pollution caused by solid waste that effects or is likely to affect human beings, animals and birds, plants and other objects, or commodities at any public place, human settlement areas or any other place (chapter 3, 4&5).

14. The Nepal Water Supply Corporation Act, 2046 (1989) has empowered the Nepal Water Supply Corporation to take necessary steps to control water pollution. Similarly, there is a legal provision to penalize anyone found contaminating the drinking water (Art 5.1.10; 18.1.2 & 19,2,1).

15. The Municipality Act, 2048 (1991) has stipulated legal provisions for environmental protection, removal or objects detrimental to public health, the issuance of directives for the control of atmospheric pollution and undertake project screening in such a manner which conserves and enhances the environment (Art. 15).

16. District Development Committee Act, 1991 also makes provisions for the cleanliness of the Districts, and empowers the Board to impose fines on those who break the directors of the Board Art 18 (1) & 39 (2).

17. Village Development committee Act, 1991 contains many provisions for improving the cleanliness and environment of the villages (Art. 14).

18. The Industrial Enterprises Act, 2049 (1992) has provisions for a licensing system for the establishment and textile, cement, carpet washing, soap, stone crushing and forestry-based medium and large-scale industries as they affect public health and the environment (Art.9)

19. The water Resources Act, 2049 (1992) prohibits any act that may pollute water resources and maintains that the utilization of the resources should be made without causing any considerable damage to the environment through soil erosion, floods, landslide or any other similar reason (Art 19 & 20).

20. The Forest Act, 2049 (1992) and the National parks and Wildlife Conservation Act, 2030 (1973) are inspired with the objectives of protecting forests and wildlife.

21. The Vehicle and Transport Management Act, 2049 (1992) maintains that the means of transport are to be operated keeping the pollution level under control (Art. 24).

22. The Environment Protection Act, 1996 and Environment Protection Regulation, 1997 came into existence. Major provisions of the Environment Protection Act, 1996 and Environment Protection Regulation, 1997 are as follows:

i Prevention and Control of Pollution

Nobody shall create pollution in such a manner as to cause significant adverse impacts on the environment or likely to be hazardous to public life and people's health, or dispose or cause to be disposed sound, heat, radioactive rays and wastes from any mechanical devices, industrial enterprises, or other places contrary to the prescribed standards.

ii Environmental Inspector

In order to effectively carry out or cause to be carried out the acts of the mitigation, avoidance or control of pollution or the acts required to be carried out in accordance with the Initial Environmental Examination or the Environmental Impact Assessment report by the Public Service Commission, appoint Environmental Inspectors or designate any employee to carry out functions of such Inspectors.

iii Environment Protection Area

HMG/N[1] may by a notification in the Nepal Gazette, maintain any place within the Kingdom of Nepal containing natural heritage or aesthetic, rare wildlife, biological diversity, plant, and places of historical and cultural importance, which are considered extremely important from viewpoint of environment protection, as an Environment Protection Area.

[1] HMG/N : *His Majesty's Government*

iv Establishment of Laboratory

HMG/N may establish different laboratories as required or may prescribe any existing laboratory to help the act relative to environment protection and pollution control.

v Power to Constitute Environment Protection Council

HMG/N may, to provide policy guidance and suggestion to His Majesty's Government with regard to environment protection, and also to have coordination among different agencies, constitute and Environment Protection Council comprising of environmental experts and representation of the persons from recognized political parties at national level as well.

vi Concession and Facility May be Provided

In addition to the concessions and facilities provided under the prevailing law. HMG/N may, to encourage any industry, enterprise, technology or process which causes positive impacts on environment protection, by publishing a notification in the Nepal Gazette, provide additional concessions and facilities as prescribed.

vii Compensation May be given

(i) In case, in consequence of the creation or disposal of pollution, sound, heat or wastes by anybody contrary to this Act or rules or guidelines framed hereunder, any person or organisation happens to suffer any loss of damage, the person or organisation affected from such actions may, if he desires to have compensation recovered from the person or institution or proponent doing such act make an application to the prescribed authority setting out the details thereof.

(ii) In case any application is filed pursuant to sub-section (1), and while doing examination by the prescribed authority of the application and the state of situation of that place as well, if it is proved that the pollution, sound, heat or wastes produced or disposed by any person, organisation or proponent has caused adverse impacts on, and resulted in any loss or damage to any person or organisation, the prescribed authority shall cause to be recovered the reasonable compensation from the person, organisation or proponent who has committed such acts to the concerned person or organisation.

viii Initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA) to be Made

A proponent shall have to carry out Initial Environmental Examination and Environment Impact Assessment of the proposal with the notification to site-specific local people. IEE is for smaller scale projects with the approval mechanisms from concerned Ministry where as EIA being larger or complex nature projects and MOPE endorses final approval.

ix Complaints May be Lodged In Case Anyone Causes Pollution or Emits Garbage.

In case any individual, institution or industry does not control pollution or emits garbage in contravention of the conditions or standards prescribed under the act or these conditions or standards prescribed under the act or these rules, the individual, institution, Village Development Committee or Municipality affected by such action may lodge a complaint with the appropriate body.

x Power of the Appropriate Body to Carry Out Sanitation and Cleanliness Activities Itself

(i) In case any individual, institution or industry emits garbage in contravention of the conditions or standards prescribed in the act or these rules even after being issued a notice

prohibiting such action causes an adverse impact on the public, the appropriate body may remove such garbage at its own cost.

(ii) The appropriate body shall realize the cost incurred by it for removing garbage from any place under Sub-Rule (1), as well as an additional charge amounting to 25 percent of that cost in consideration of having done so, from the individual, institution or industry which has emitted those garbage, as government arrears under current law.

xi Environment Protection Fund has been set up comprising of 7 members and headed by the Secretary, Ministry of Population and Environment.

xii Power to Grant Rewards, Commendation Letters, or Logo

(i) The Ministry may grant a cash reward or a commendation letter to any individual or institution, which renders noteworthy contributions in matters concerning environmental conservation, control and prevention of pollution, and conservation of the national endowments as a token of respect.

(ii) Any industry that renders noteworthy contributions as mentioned in Sub-Rule (1) may be granted by the Ministry and environment-friendly logo with the right to use it on its specific products.

(iii) In case any industry does not control and prevent pollution in violation of the act or these rules, the Ministry may impose a ban on the use of the environment-friendly logo granted to it.

(iv) The Ministry shall publish a public notice of the ban imposed under Sub-Rule (iii)

Existing Environment Institutions

Some major institutions are as follows:

- National Committee on Man and Biosphere: 1974
- National Resources Conservation Commission: 1980
- Environmental Impact Study Project: 1982
- Environment and Resource Conservation Division at NPC: 1987
- Council for Conservation of Natural and Cultural Resources, 1989
- Environment Protection Committee, House of Representative, 1990
- Ministry of Forests renamed as Forest and Environment: 1992
- Environment Protection Council: 1992
- Sectoral Ministries: Forestry, Agriculture, Industry, Water Resources, Transport, Local Development, ...
- Several NGOs, CBOs Universities and other institutions
- Ministry of Population and Environment (MOPE):

  Environmental issue is like a red card today in our enquires, developmental review, institutional setting as well as in regional responses. The local and regional development policy formulation and legislative enquires do refer to this multi-sectoral frontier with gravity seeking economic interrelationship. In view of all these the Ministry of Population and Environment established in 1995 has the mandate to steer the overall policy framing, legislative exercises, implementational reviewing/monitoring and to attend to responses as well as participation at the regional and international level.

  The MOPE's functions have been categorized in areas of policies, legal and institutional for Population and Environment management.

Population

In relation to Population management, the Ministry is the executing agency for development of policies, legal frameworks and institutions. The Ministry functions as secretariat for National Population Committee headed by the Prime Minister.

Environment

- Environment Conservation
- Pollution Control
- Environment Standards Enforcement and Monitoring
- Environment Impact Assessment

Major Tasks

a. Policy formulation in sphere of Environment and Pollution control.

b. Researches and studies related to integrated land use, utilization of natural resources, develop statistics of natural resources and prepare reports on environmental situation.

c. Program formulation in the sphere of environment impact, legislation related to the use of natural resources, environmental protection and ecological balances.

d. Relationship with international organization:

   i. Establish focal points of the international institutions related to environment and resource conservation.

   ii. Develop close contact with Government Non-government Organization and International Institutions to enlarge Nepalese participation in environmental program.

   iii. Prepare comments related to environmental dimension on the developmental projects presented

by international agencies. Publication of National State of Environment Status has been already initiated.

e. Coordinating role:

i. Intersectoral relationship within the major divisions and sections created in the MOPE with reference to land use & resource management and environmental consideration.

ii. Consultative role with the relevant donor agencies to limit duplication of work and develop relevance in the project activities related to environment, resource conservation and land use.

iii. Coordinative role within the sectoral agencies in the formulation of program or projects with the expressive concern of correct land use practices.

iv. Essential role in promoting positive inputs of local community, private sectors, Non-Governmental Organization & Social Groups or institution in the activities related to environment management & land use practices.

v. Secretariat for Environment Protection Council.

Existing Institutional Capabilities and Strengthening

Most of environmental institutions in developing countries are small and suffer from inadequate staffing and financial resources. Meantime the monitoring and enforcement capabilities are also weak. Natural disaster prevention and environmental mitigation initiatives in these countries need forecasting, early warning, risk assessment and mapping of climate and water-related hazards in areas such as landslides, floods, cyclones, earthquakes and draughts etc.

In Nepal, sectoral vision and prime urge for dominance are the major interfering elements, which bring forth-prevailing institutional disorder and implementation crisis. Mere institutional proliferation has neither enhanced efficiencies nor brought effective implementation. Instead it develops areas of confusion, negative conflicts and unhealthy competitions. The existing enunciation, formulations and enactment are, to me it appears, adequate to start with, the operational exercises leading to adjustment, revision and orientative adaptations. The time demands wider range of perception, patience in hearing, and participatory reconciliation, in identifying major problems emerging in the common front of the multi-sector members. The latent urge act, and to rectify the institutional structuring, is to be explored; and, the immense potentiality of the indigenous expertise are to be commissioned, and encouraged for participation with enhanced level of recognition.

Emphasis will have to given for:

(a) decentralization of decision making at the local level for projects implementation, enforcement of legislation and promotion of public awareness

(b) adaptation of appropriate technology

(c) encouragement to technical education adoption to enhance flexibility to adopt to future economic and technical challenges

(d) Develop operational guidelines to incorporate community participation into projects and policies, training programs for facilitators and adopt transparency mechanisms.

Suggestions for policy reform and institutional strengthening

Nepal has achieved considerable success in abating the extent of land degradation in the targeted areas working through watershed management projects. Users group's formations have helped restoring forests. With the introductions of legislators, regulating standards, environment planning procedures such as Environment

Assessment Studies requirements, Strategic Plan of Actions, Nepal has clearly shifted away from the paradigm of "Grow now, clean up later".

Emphasis has been for structure of good governance set up and decentralization of decision making at the local level, so that a strong, efficient and democratic government system is developed. In order to bring changes in the attitudes of human beings and conserve nature active press with educated mass have to be mobilized. Economy policy will have to be focussed for a relatively equitable distribution of income.

Thus the wise consul would be to facilitate building up of the voluntary urge to act with the conviction that creative inception of operating exercises, will help us functioning in reinforcing legal measures, in strengthening institutional arrangements, in activating Coordinative measures, in enhancing awareness and stimulating capability utilisation, and in opening a workable corridor for private sectors, NGOs etc with all the limitations we are having. This, I do trust, would be a major breakthrough for sound and sustainable environmental management within the nations in general, and the regional achievement in particular.

Role of Judiciary in Promoting the Development And Enforcement of Legal Norms

(Norms in the field of Sustainable Development)

Udaya Nepali Shrestha
Special Secretary,
Ministry of Law and Justice

Introduction

Each country in this world wants to be developed and prosperous. Unfortunately, for a long period of time, the term "development" became associated with development for human habitation without recognition of human society's dependence on natural systems[2]. Development, without taking into account its socio-economic, human and ecological implications, has proven unsustainable and resulted in environmental degradation, sharp depletion of non-renewable natural resources, acute pollution problems, desertification, climate change and other natural calamities.

The principle of sustainable development attempts to assess or quantify development in relation to the impact of its range of effects or potential effects on the local and global environmental media at risk[3]. As John D. Leeson says, sustainable development is particularly concerned with wider national or regional trends and longer term consequences of social and commercial developments, confronting decision–makers with choices between the more immediate, quantifiable merits of a proposed course of action and the more speculative benefits to future generations of present self-denial[4]. It is a multidimensional concept and has many aspects: ecological, social, economic and cultural. However, the purpose of this paper is neither to analyze all the aspects of sustainable

[2]Cairns, John, "Sustainability, Ecosystem Services, and Health,"International Journal of Sustainable Development and World Ecology, Volume 4, 1997.
[3]Leason, John D., Environmental Law, 1995, Pitman Publishing, London;
[4]Ibid

development nor to identify the role of all the agencies working in the field of development. In this paper, attempts will be made to identify the role of judiciary in promoting the development and enforcement of legal norms in the field of sustainable development. For this purpose, the meaning and approaches of sustainable development will be considered at the first part. In the second part, a general overview of legal provisions of Nepal relating to the issue of national environment and sustainable development will be made and, in the third part, attempts will be made to identify and analyze the role played by Nepalese judiciary in promoting sustainable development. In the final part, some suggestions will be made in this regard.

Meaning and Approaches of Sustainable Development

The definition given by the World Commission on Environment and Development (WECD) in its report entitled "Our Common Future" is considered the first definition of sustainable development[5]. The Report, popularly known as the Brundtland Report, defines sustainable development as, "----------development that meets the needs of the present without compromising the ability of future generations to meet their own needs."[6]

This definition seems to be influenced by the opinion of Thomas Jefferson who believed that each generation should pass the world on to the next generation in as good, or better, condition as it was received from the previous generation[7]. According to Welford, the definition of the Brundtland Report has three interrelated elements, which he labels as 'environment', 'equity', and 'futurity'[8]. A Goodland state that sustainability has three dimensions, namely social, economic and environmental sustainability[9].

[5]Wheremeyer, Walter and Tyteca, Daniel, "Measuring Environmental performance for industry from legitimacy to sustainability and biodiversity?" International Journal of Sustainable Development and World Ecology Volume 5, 1998.
[6]Ibid
[7]Supra Note 1.
[8]Supra Note 4.
[9]Ibid

Environment Centered Concept

The environment-centered concept of sustainable development affirms that the natural environment underlies economic development and progress and, taking into account current pressures on natural resources and land use, requires protection and management to a much higher and more rigorous degree than hitherto. This concept favors environment-friendly development and believes that such development will be sustainable. The concept of environment-friendly has three basic propositions[10];

- All economic activities ultimately depend upon the environmental resource base.
- The environmental resources base is finite.
- Imprudent use of the environmental resource base may irreversibly reduce the capacity for generating material production in the future.

On the basis of these propositions, the environment-centered view requires practice of some principles and courses of action in order to achieve sustainable development[11].

- Natural resources should be exploited in a sustainable, prudent, wise or appropriate manner.

- Environmental considerations should be integrated into economic and other development plans, programs and projects as well as development needs should be taken into account in applying environmental objectives.

However, sustainable development does not mean having less economic development nor does it entail preservation of every aspect of the present environment at all costs. It only requires that decisions on development programmes should be taken with proper regard to their environmental impact. Thus, the environment impact

[10] Supra Note 2.
[11] Sands, P. Principles of International Environmental Law, Vol. I, Manchester University Press, 1995, Pages 183-237.

assessment is the main tool for integrating environmental consideration into socio-economic development and the decision-making process. The primary purpose of environmental impact assessment is to ensure consideration of the likely environmental effects of possible schemes so that decisions can be made with a knowledge of their environmental consequences, including deciding whether or not to proceed with a scheme, identification of ways in which environmental effects could be minimized, assessment of the importance of predicted effects and evaluation of the scope for mitigation. Principle 17 of the Rio Declaration provides that environmental impact assessment, as a national instrument, shall be undertaken for proposed activities that are likely to have a significant adverse impact on the environment and are subject to a decision of a competent national authority.[12]

John D. Lesson states that certain principles should be observed in this respect.[13]

- Decision should be based on the best possible scientific information and analysis of risk;

- Where there is uncertainty and potentially serious risks exist, precautionary measures may be necessary;

- Ecological impact must be considered, particularly where resources are non-renewable or effects may be irreversible; and

- Costs implications should be brought home directly to the people responsible in accordance with the 'polluter pays' principle, which requires the cost of preventing pollution or of minimizing environmental damage due to pollution be borne by those responsible for the pollution. Remedying the pollution or preventing its occurrence is the primary aim of the 'polluter pays' principle.

[12] Pant, Dr. Amber Prasad, "Sustainable Infrastructure Development Principles and the Nepalese Experience, Nepal Law Review, Vol.12, No. 1, 1998.
[13] Supra Note 2.

Equity Centered Concept

The equity-centered concept of sustainable development is based on the principle of distributive justice. It requires that access to and control over environmental goods or other resources should be fair across generations, across the globe and within countries. Equity includes both intergenerational equity and intergenerational equity. The intergenerational equity reflects the view that as members of present generation, we hold the earth in trust for future generation, while at the same time we are beneficiaries entitled to use it. All human generations form a partnership that extends across time in relation to their human environment. According to a Report prepared by the UN Development in 1996, intergenerational equity includes three components; quality, options, and access to the environment, which must be comparable across generations.[14]

Equitable quality requires each generation to maintain the quality of the planet so that it is passed on in no worse condition than received. The element of options requires conserving the diversity of the natural and cultural resource base so that it does not unduly restrict the options available to future generations in solving their problems and satisfying their own values. Access requires that each generation provide its members with equitable access to the legacy of the past and to the natural environment. [15]

The intergenerational equity reflects the view that the fruits and burdens of development and natural resources or income should be distributed equitably among countries, societies and individuals. Intergenerational equity requires a non-discriminatory bearing of environmental burdens and comparable access to environmental benefits.[16]

The equity-centered concept of sustainable development is sometimes considered a political concept of sustainable

[14] UN Department for Policy Co-ordination and Sustainable Development, Report of the Expert Group Meeting on Identification of Principles of International Law for Sustainable Development, 26-28 September 1995, Geneva, Switzerland

[15] Ibid.

[16] Ibid.

development. It includes the rights of all groups to participate in productive activity. According to the Report of the UN Department for Sustainable Development, it specifically includes the right of workers to organize in order to protect their own interests, and the role of employers and enterprises in social and economic development.[17] Freedom to exercise these rights is needed to ensure that overall development planning takes account of the views of those interested, and that conditions of the work and employment which are the basis of productive activity are fair, informed, realistic and applicable. In a legal sense, the equity-centered concept reflects the view that everyone should have the right to information on the exploitation of natural resources and should have *locus standi* to bring environmental claims in domestic and international courts.[18]

The equity-centered concept of sustainable development is also based on some other principles and ideologies apart from those described above. The right to development, eradication of poverty, population growth control, public trust doctrine etc. are some of these principles.[19] The right to development relates to the basic right of every human person to life as well as the right to develop his or her potential so as to live in dignity. It also relates to the right of people to existence and to develop themselves. Principle 3 of the Rio Declaration states that the right to development must be fulfilled so as to equitability meets developmental and environmental needs of present and future generations. Similarly, the Draft IUCN Covenant also contains a provision on the integration of the right to development into sustainable development.[20] Its Article 8 stipulates that the exercise of the right to development entails the obligation to meet the developmental and environmental needs of humans in a sustainable and equitable manner.[21]

The principle of the right to healthy environment believes that development is sustainable where it advances or realizes the right to healthy environment. Principle 1 of Rio Declaration expresses

17 Ibid.
18 Ibid.
19 Ibid.
20 IUCN & et. al, Caring for the Earth A Strategy for sustainable Living, IUCN, 1991.
21 Ibid.

that human beings are at the center of concerns for sustainable development and are entitled to a healthy productive life in harmony with nature. Chapter 6 of Agenda 21 states "health and development are intimately interconnected. Both insufficient development leading to poverty and inappropriate development resulting in over-consumption, coupled with expanding world population, can result in severe environmental health problems... Agenda 21 must address the primary health needs of the world's population, since they are integral part to the achievement of the goals of sustainable development and primary environmental care."[22]

The principle of eradication of poverty believes that all individuals should be provided with the possibility of earning a living in a sustainable way, in just and decent conditions. Principle 5 of the Rio Declaration clearly links the effort of eradicating poverty with the achievement of sustainable development. The principle of eradication of poverty includes the right to work and the pursuit by governments of a policy of full, productive and freely-chosen employment as well as the right for individuals to enjoy free participation in economic activity without discrimination on the basis of race, colour, sex, religion, political opinion, natural extractions or social origin, and the need to recognize the aspirations of tribal and indigenous people in respect of economic development.
In respect of the relation of population growth with sustainable development, the Brundtland Report states that sustainable development can be pursued more easily when population size is stabilized at a level consistent with the productive capacity of the ecosystem.[23]

The publics trust doctrine is related with the exercise of powers by states over their natural resources. This doctrine believes that the right of all people to use and protect natural resources like water, air, forests etc. of their respective countries should be protected and the state should not transfer such public natural resources to any individual or corporate body providing him or it exclusive right to exploit such resources. The state's role in respect of these public natural resources is that of a trustee only.

[22] Supra Note 13
[23] Supra Note

On the basis of the various principles discussed above, it could be easily said that the concept of sustainable development is a very broad and, in some aspects, vague concept. Although it is true that economic development, social development and environmental protection are interdependent and mutually reinforcing components of sustainable development, the problem is that a sustainable system can be identified only after the happening of a fact. Definitions of sustainability are actually predictions of what set of conditions will actually lead to a sustainable system. Some tools or techniques, however, have been developed to indicate the sustainability of development and it is a common belief now that the observance of the above-mentioned principles will definitely lead towards sustainable development. In the next part, we will look into the legal provisions of Nepal incorporating the principles of sustainable development.

Overview of Law and National Environment and Sustainable Development Issues in Nepal

Achieving sustainable development has been the prime focus of Nepal's development strategy. It has always complied with international call in good faith in this field. The enforcement of the "National Conservation Strategy, 1987" can be taken as the first step of Nepal towards sustainable development. The Strategy made various provisions for resource conservation and its utilization in an environment-friendly manner. It emphasized socio-economic and environmental impacts assessment focused on wise use, protection, preservation and restoration of natural resources.

Similarly, periodic five-year plans also adopted policies for sustainable and environment-friendly development. National policies on various sectors have also incorporated environmental concerns. For example, the Industrial Policy, 1992, prescribes to minimize the adverse effect to environment from industrial enterprises. In order to respond to Agenda 21 and to address environmental problems, His Majesty's Government formulated the Nepal Environmental Policy and Action Plan Integrating Environment and Development in 1993, which incorporates

environmental concerns into the country's development process and aims, among others, to mitigate the adverse environmental impacts of development projects and human actions.

Norms related with sustainable development have also been incorporated in the Constitution of the Kingdom of Nepal and various Acts and Rules. Constitutional and legal provisions regarding both the environment-centered and equity-centered aspects of sustainable development can be found in Nepal. The provisions of Parts 3 and 4 of the Constitution are specifically important in this respect. Part 2 provides various fundamental rights to Nepalese citizens. Right to equality, right to freedom, press and publication right, right to information, cultural and educational right, right to property, right against exploitation and right to constitutional remedy can be considered to have been based on the equity-centered aspect of the concept of sustainable development. Part 4 of the Constitution has created constitutional responsibilities and duties upon the State for, among others, safeguarding both the environment-centered and equity-centered aspects of sustainable development. Article 26(3) and (4) provides for environment-friendly development. Article 26(3) states:

"The State shall pursue a policy of mobilizing the natural resources and heritage of the country in a manner which might be useful and beneficial to the interest of the nation."

Similarly, Article 26(4) states:

"The State shall give priority to the protection of the environment and also to the prevention of its further damage due to physical development activities by increasing the awareness of the general public about environmental arrangements for the special protection of the rare wildlife, the forests and vegetation."

In order to give effect to these constitutional mandates various Acts and Rules have incorporated provisions for environmental concerns in carrying out development activities and exploiting natural resources. Let us look into the provisions of some Acts.

The Forests Act, 1992 has given high importance to the forest sector in the promotion of environment. It aims at protecting forests, forest products and biological diversity and promoting their sustainable use. Section 68 of the Act stipulates that His Majesty's Government may grant permission to use any part of the forests managed by it or protected forests, community forests, lease-hold forests or religious forests in order to implement the projects of national priority, only if forests are required to be used in the implementation of such projects and no adverse effects will cause to the environment in implementing such projects. In case any losses or damage occur to any person or community while carrying out such projects, appropriate compensation is required to be paid to such person or community.

Section 3 of the Water Resources Act, 1992, has adopted the public trust doctrine and provides that the State shall have ownership over all the water resources of the Kingdom of Nepal. Section 19 prohibits pollution of water resources and authorizes His Majesty's Government to fix the tolerable level of pollution standard in such resources. Likewise, Section 20 provides that the utilization of water resources should be done in such a manner that no substantial adverse effect be made on environment by way of soil erosion, flood, landslide or other similar causes. Similar provision can be found in the Electricity Act, 1992. Section 4 of the Act requires conducting an environmental impact assessment of any project generating, transmitting or distributing electricity before applying to obtain a license to carry out such projects. Section 24 provides that electricity generation, transmission or distribution projects shall have to be carried out in such a manner that no adverse effect be made on environment by way of soil erosion, flood, landslide and pollution etc.

Mine and Mineral Substances Act, 1985 provides that no one can extract or market any minerals without obtaining a license therefor and the Department of Mines and Geology shall have the power to prohibit mining activities on environmental grounds. Similar provisions have been incorporated in the Petroleum Act, 1983, which provides that all activities associated with the extraction, production and distribution of petroleum and its products should be undertaken without causing damage to the forest and other natural resources

and any pollution of the environment. In respect of industrial enterprises, the Industrial Enterprises Act, 1992 provides the formation of an Industrial Promotion Board, which has the power to cause industrial enterprises to follow the ways and means for the prevention of the environmental pollution by putting more emphasis on the avoidance of effects on the environment and the public health.

Apart from the above-discussed Acts, there are other sectoral Acts, which have incorporated some kind of legal norms relating to sustainable development. Legal provisions related to environment-friendly development are scattered in various pieces of legislation. According to one study, more than forty pieces of sectoral legislation have some sort of legal provisions related with the environmental conservation and the sustainable use of resources. Most agencies that are mandated for development activities are also required to undertake conservation and pollution prevention measures.

In order to fill the gap of comprehensive environment protection legislation, the Environment Protection Act, 1997 has been enacted and enforced recently. The Act provides statutory backing to the Environment Protection Council established by His Majesty's Government and envisions the establishment of an environment protection agency. The Act has made various provisions on carrying out initial environmental examinations and environmental impact assessments before implementing any developmental activities, as specified in the Rules framed under the Act, and on the prevention and control of pollution, on the conservation of national heritage, on the establishment of environment conservation areas, on the establishment and operation of environment protection fund, and on the compensation to be paid by the polluters. The Act has entrusted His Majesty's Government with the responsibility of developing environmental standards and provision for the enforcement of such standards by including them in the regulations. In order to translate the legislative intent of the Act into formal regulations, the Environment Protection Rules, 1997 have been framed. These Rules have detailed requirements and procedures which are to be followed in the preparation of an initial environmental examination and environmental impact assessment (EIA), the timing and the content of the EIA, review procedures for

EIA studies, pollution control activities, pollution abatement notices, infringement notices and heritage and biodiversity conservation measures. An important aspect of these Rules is that they have incorporated the principle of public participation in decision-making. Rule 8 of these Rules requires the EIA report to be sent to the concerned local bodies for their comments.

In addition to national legislation as mentioned above, Nepal has become a member to various international conventions related to sustainable and environment-friendly development. The Convention on Biological Diversity, 1992, the Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, 1989, the UN Framework Convention on Climate Change, 1992, the Convention on International Trade in Endangered Species of Wild Fauna and Flora, (CITES) 1973, and the Convention concerning the Protection of the World Cultural and Natural Heritage, 1972 can be taken as examples in this regard. Nepal is a party to at least fifteen international environmental instruments. These Conventions are legally binding in nature in Nepal as the Treaties Act, 1991 stipulates that the provisions, of treaties to which Nepal is a party prevail over any legal provision and requires the government to enact legislation for the implementation of such a treaty or convention, if it is required.

Although the Constitution and more than forty pieces of legislation have incorporated various legal norms related with sustainable developments and the State has become a party to more than fifteen international environmental instruments, neither the legislation has addressed all environmental conservation and pollution problems nor the situation of enforcement of existing legislation is encouraging. Likewise, national implementation of international environmental treaties to which Nepal is a party is very weak. For example, Nepal has not been able to formulate a Biodiversity Plan and an appropriate legislation even after four years of becoming a party to the Biological Diversity Convention. Neither separate legislation nor administrative procedures for implementation of CITES have been adopted. Even most of the minimum contents for "sustainability law" as specified in "Caring for the Earth", a joint publication of IUCN, UNEP and WWF do not exist in Nepalese

legal regime. The minimum contents of "sustainability law" as outlined in the said publication include the application of the precautionary principle and the best available technology when standards of pollution are set, the use of economic incentives and disincentives based on appropriate taxes, charges and other economic instruments, the requirement that all proposed new developments and new policies should be subject to environmental impact assessment, the requirement that industries and government departments and agencies be subject to periodical environmental audit with effective monitoring, permitting detection of infringements and adjustment of regulations where necessary, and granting of public access to EIA, environmental audit data and monitoring results and to information about production, use and disposal of hazardous substances.[24]

One main legal norm missing from the Nepalese regime is citizen suit provisions. These provisions allow a citizen to sue polluters who violate laws, regulations and the terms of their license and who degrade the environment significantly, as well as government agencies, which fail to undertake mandatory activities. In such a situation, the role of judiciary can be very important. The judiciary can play the role of an environmental activist to integrate economic and environmental concerns and thereby ensure the right to a healthy environment of people. In the next part, we will look into the role played by Nepalese judiciary in this regard.

Role of Nepalese Judiciary in Promoting Sustainable Development

The judiciary is considered the guardian of the constitution and legal system of a country. It is responsible for the protection of the constitutional and legal rights of people. As we discussed above, most of the legal norms in the context of sustainable development are related with people's basic rights, such as the right to development, the right to information on the exploitation of natural resources, the right to a healthy environment, the right to people's participation in decision making, fair and equitable share in the fruits of development etc. When the judiciary plays an effective role to

[24] Supra Note 19.

protect these rights, such a role definitely leads towards achieving sustainable development.

In the context of Nepal, the judiciary has been contributing in promoting the development and enforcement of legal norms in the field of sustainable development by exercising its powers conferred to it by Part 11 of the Constitution and by the provisions of other Acts and Rules. Article 88(2) of the Constitution has conferred such powers to the judiciary, which are extremely important for the enforcement of legal norms related with sustainable development. Article 88(2) provides:

"The Supreme Court shall, for the enforcement of the fundamental rights conferred by this Constitution, for the enforcement of any other legal right for which no other remedy has been provided or for which the remedy even though provided appears to be inadequate or ineffective, or for the settlement of any constitutional or legal question involved in any dispute of public interest or concern, have the extraordinary power to issue necessary and appropriate orders to enforce such rights or settle the dispute. For these purposes, the Supreme Court may, with a view to imparting full justice and providing the appropriate remedy, issue appropriate orders and writs including the writs of *habeas corpus*, *mandamus*, *certiorari*, Prohibition and *quo warran to*:"

In such a situation, the gaps of regulatory and effective legislation have been filled by the decisions of the Supreme Court, and the Court has played a very effective role in the enforcement of right to information. The legal principles laid down by the Court in the cases of Balkrishna Neupane vs. Prime Minister Girija Prasad Koirala and others, Gopal Siwakoti vs. Ministry of Water Resources and others and Kashi Dahal vs. His Majesty's Government and others are important in this regard. In Balkrishna Neupane's case, the Court ruled that acts and proceedings taken in respect of the Government in a democratic system should be transparent for public accountability. All the acts or decisions performed or taken by the Government which may directly or indirectly affect the country or any group or community of general public are of public importance, and it is the duty of the Government to give information to the public

on the acts performed or decisions taken by it on such matters of public importance. In Gopal Siwakoti's case, where the writ petitioner had sought information about the acts and proceedings of Arun III Hydro-electricity Project, the Supreme Court said that the security of the State, governance system, education, morality, economic condition of the State, development of water resources, social justice as regulated in the Directive Principles of the State in the Constitution etc., are the matters of public interest or concerns. To remove uncertainties in regard to the enforcement of right to information, the Court issued a directory order to His Majesty's Government to enforce the Secrecy of Documents Act or to frame an internal regulation or make a new law as soon as possible. Pending the implementation of the Court's order, the Court itself made a regulation to provide information, which can be taken as a hallmark in the enforcement of the right to information.

In Kashi Dahal's case, where the writ petitioner sought the information on the actual situation and reasons of removing idols from Mayadevi Temple and cutting down *Pipal* trees situated therein, the Supreme Court issued the writ of *mandamus* in the name of Lumbini Development Trust to disseminate real information to the general public in this respect. In this case, the Supreme Court stated that it is the duty of the Government to disseminate information on matters of public importance to the general public irrespective of the fact that no one has come to seek for such information.

Judicial Activism and Issuance of Directory Orders

Where the existing legal procedures fail to deliver justice in a real sense, then the Court, being within the judicial powers conferred by the Constitution, has to show activism in this regard. The legal norms incorporated in existing Nepalese legislation in respect of environment friendly and sustainable development are much more government-centered and the effectiveness of such norms depends upon the actions and efficiency of the governmental agencies. When the governmental agencies fail to perform their duties, and even the legal regime does not address environment related problems properly, then the judicial activism is required for the effective implementation or development of legal norms for sustainable

development. The environmental judicial activism shown by the Indian Supreme Court and a few High Courts has proven effective in this regard.

Although the judicial activism shown by Nepalese Supreme court in some cases is very encouraging, we are still far behind the Indian system. Yogi Naraharinath's case is the most remarkable case till now in respect of environmental judicial activism in Nepal. In this case, the writ petitioners had prayed for the issuance of the writ of certiorari to set aside the decision taken by His Majesty's Government on providing 42 Bigaha land with forests located at the north side of Narayanghat Bazar to the International Society for Medical College on lease. The Writ petition was based on the constitutional provisions of Article 26 (4). The writ petitioners claimed that since the land being provided to the college was situated is a place important for environment protection and preservation of archaeologically important materials, the decision of the Government to provide such land to a college was against the provisions of Article 26 (4) and, therefore, should be set aside. The Supreme Court accepted the contentions of the writ petitioners and made a very progressive interpretation on the enforcement of Part 4 of the Constitution. The Court said that although the Directive Principles and Policies of the State as outlined in the Constitution are not enforceable in any court, the Court can point out the decisions as against the Constitution if the Government takes any decision contrary to the Directive Principles and Policies of the State as set forth in the Constitution. On this ground, the Court declared the decision of the Government to provide a land of religiously, environmentally, naturally and archaeologically importance to the College without specifying any specific reason to provide the same land, but not others, to the College, as null and void.

Review of Legislative and Institutional Framework in Nepal Dealing with Climate Change

Prof. Dr. Bidur Upadhyay
Tribhuvan University

Introduction

Humanity faces an imposing array of environmental problems on a worldwide scale, including a catastrophic loss of biotic diversity, depletion of ozone layer, acid precipitation, toxication of the entire planet, and growing fatal diseases such as AIDS and so on. No problem is more daunting, though, than the global and climate change of the earth's surface. This change may make the already poor still poorer and increase the difference between the rich and poor, developed and developing, with the prevalence of harsh environmental situations, notably drought, desertification, floods and related geophysical problems like soil erosion. This threat is the result of the anthropogenic emission of certain gases in the atmosphere, most notably CO_2, CH_4, CFCS, NOx, and water vapor, contributing to a general process known as the "greenhouse effect." The term greenhouse gas has been applied to atmospheric gases that are relatively transparent to incoming short wave solar radiation, but which absorb the long wave radiation from the surface of the earth and remit it downward, warming the surface of the earth and lower atmosphere. The primary concern to date has been with CO_2, released from the burning of coal and other carbon-based fuels and the burning and decay of the world's forests.

Since 1958, when measurements of CO_2 in the atmosphere began, its concentration has increased from 315 to over 360 parts per million. A doubling of CO_2 from pre-industrial levels could result in a general warming of the earth's surface. Concentrations of other gases, currently at much lower concentrations than CO_2, but potentially more potent, are increasing even more rapidly. Methane, which is emitted from wetlands, rice paddies, livestock and warming permafrost, is increasing at a rate of one per cent per year compared

to 0.4% per year for CO_2. CFCs have been increasing 5% per year, although recent international agreement has resulted in significant decline in the global emissions of CFCs. Another source of additional CO_2 and methane for the atmosphere is the simulation of the respiration of plants and respiration of organic matter in soil by warming itself. (Woodwell, 1983)

Over the last 100 years, mean global surface temperature has increased by 0.3 – 0.6 (Folland et al., 1992). Based on outputs from the GCM model, the Intergovernmental Panel on Climate Change (IPCC) has concluded that if no policies to reduce greenhouse gas emission were introduced, the world be about 2.0 degree celcius warmer and sea level would be 50 cm higher in 2100 AD. Warming may also increase mean global precipitation by 3-15%, though the nature of regional variations still remains uncertain. (WMO/UNEP, 1996).

Climatic phenomenon such as monsoons, El Nino, floods and drought has a life and death importance to Nepalese economy. Vulnerability to the adverse effects of climatic change is likely to increase over the years. Hence, to protect the environment from the catastrophic effects of climate change, initiatives are needed to identify 'adaptation' strategies, which will meet development needs as well as safeguard resources in the long term so that we are better able to cope with the changes. Specific laws and institutions are required. But it is not possible to suggest or to recommend any new law and institution without knowing the existing one. To deal with the problem properly, the existing legislative and institutional framework needs to be reviewed to assess both their functions as well as their limitations in meeting future challenge. Most of the environmental issues in Nepal are concerned with deforestation, pollution and unsystematic land use, which are also found responsible for the climate change phenomenon in the global context. Hence, in this paper instead of recommending any new laws and institutions to cope with climate change, existing environmental law/institutions are thoroughly reviewed and suggestions made for making those laws effective and institutions efficient and functional. New Acts and institutions are also recommended to control environmental pollution.

International Legal and Policy Options

Several International meetings in the past have discussed the potential effects of climate change, as well as policies to prevent, mitigate, and adapt to global climate change beginning with the World Climate Conference of 1979. The WMO/UNEP scientific conference at Villach, Austria 1985 and the Villach-Bellago meeting of 1987 both expressed the extent of the consensus that exist among scientists that warming will proceed rapidly and present a serious threat to the human race. This was followed by the report of the World commission on Environment and Development (1987). The UN General Assembly's first debate on "our common future", in October 1987, was marked by reference to global warming by a plea from the president of Maldives for international action.

The first and most significant pronouncement on international legal initiatives in dealing with climate change emanated from the Toronto Conference on changing the atmosphere: Implications for Global Security, June 1988. This conference recognized that no single international organization, country, industry, or individual can tackle the problem in isolation, and called on all to take specific actions to reduce the impending crisis caused by the pollution of the atmosphere, and to work with urgency towards an action plan for the protection of the atmosphere. In December 1988, the General Assembly of the United Nations adopted a resolution on the protection of the global climate for present and future generations of mankind. This resolution recognized that climate change is a common concern of mankind and recommended the negotiation of an International Framework Convention to materialize the resolution. About the same time, the World Meteorological Organization and United Nation Environment Program established an Intergovernmental Panel on Climate Change (IPCC).

In 1990, the report of IPCC was published. This document stated that the concentration of greenhouse gases would double in the year 2025 compared to pre-industrial levels. It was predicted that this would lead to an increase in global temperature by about 0.3 degree per decade.

The IPCC process was an unprecedented scientific consensus of the global scientific community concerned with climate change. Forty nine Nobel prize winner appealed to President Bush (USA) to curb greenhouse gas emissions professing that "global warming has emerged as the most severe environmental threat of the 21st century... only by taking action now can we ensure that future generations will not be put to risk".

The second World Climate Conference held in November 1990 was the culmination of the IPCC process. Several major decisions were taken to save planet from the impact of climate change. The ministerial declaration of this conference well recognized the special development need for the developing countries as follows:

"We recognize that developing countries have as their main priority, alleviating poverty and achieving social and economic development and that their net emission must grow from their, as yet, relatively low energy consumption to accommodate their development needs. Narrowing the gap between the developed and developing world would provide a basis for a full partnership of all nations and would assist the developing countries to meet incremental cost required to take the necessary measures to address climate change and sea level rise, consistent with their development needs, and we recommend that adequate and additional financial resources should be mobilized and best available environmentally sound technologies transferred expeditiously on a fair and most favorable basis. Developing countries also should within the limits feasible, take action in this regard."

Global climate change thus emerged as a major scientific and political issue in a very short period of time as this issue started to arouse public concern. The UN General Assembly meeting in 1990 recognized the importance of global climate change and instituted the process for an Intergovernmental Negotiations Committee for a Framework Convention on Climate Change (INC/FCC). The INC/FCC drafted the convention and adopted it on 9 May 1992 at UN headquarters in New York. The convention was opened for signature at the June 1992 Earth Summit in Rio de Janerio. It was signed by

the Heads of State and other senior officials from 154 countries and entered into force on 21 March 1994. Nepal ratified the convention on 2 May 1994 and enforced the protocol of the convention from 31 May 1994.

The conference of the parties (COP), had its first session in Berlin in 1995, the second conference (COP2) in July 1996 at United Nations Geneva and the third in December 1997 in Kyoto, Japan. The fourth session where Nepal for the first time took part in the conference was held in Argentina last year on 12 Nov.1998.

Several multilateral instruments, beginning with conventions on arm regulation, have provided useful insight on how the proposed exercise of stabilizing the composition of the greenhouse gases may proceed. Notably they are the 1963 Treaty banning nuclear weapon tests in the atmosphere, the 1977 Convention on the prohibition of military or any other hostile use of environmental modification techniques; the 1979 Convention on Long-range Trans-boundary Air Pollution, with its Helsinki Protocol on the reduction of sulphur emissions, the 1988 Sofia Protocol on the control of emissions of nitrogen oxides; the 1982 Law of the Sea Convention; and finally the 1985 Vienna convention for the protection of the ozone layer with its Montreal Protocol of 1987.

Systems that fail to conserve the source base eventually lose their ability to produce, and those that fail to protect the environment eventually destroy their reason for existence. On the other hand, if systems fail to provide adequate food supply at a reasonable cost, they lose their utility to the society. Systems that are not commercially competitive will not generate the profit that is necessary for economic survival. So there is no conflict between the protection of environment and development from the standpoint of the society.

In the past in Nepal, the economic model of development never captured the factors that influence economic development. Though it had few successful examples of growth, poverty remained a major problem in Nepal. Not only problems in equalities, denial of human rights, social deprivation and the rise of corrupt elite are also problems of equal intensity. In this connection the Brundtland report points out that the gross mismanagement of our planet has much to do with an unequitable distribution of the benefits of development and perpetuating this inequality can only mean a continuing draw down on the world's natural resources and environment. Close to a billion people live in poverty and squalor, a situation that leads to little choice but to go on undermining the condition of life itself, the environment and the natural resource base. This is especially true in Nepal, where poverty is both the cause and the result of environmental degradation, as the poor, who have limited access to resources, can ill afford to maintain foresight and to conserve resources for tomorrow. In such a situation, poor countries like Nepal have no option but to develop. It has to choose a pattern of development which is sustainable and which will not be self-defeating in the long run. As already mentioned, one cannot overcome poverty without generating resources through economic growth and expansion. Sustainable development requires more, rather than, less resource and can only be possible if there is a serious commitment on the part of the development countries to mobilise and transfer resources to the third world countries to stimulate sustainable development and thus avoid further degradation of the environment.

Despite the efforts to provide family planning services in the country, the population is increasing very rapidly. The dynamics of past, current and anticipated growth are complex and are not as fully understood as we would like. The growth rate is as high as 2.1 per cent per annum. It is projected that our current population will be doubled by the year 2020 AD. According to an UNFPA estimate, Nepal's population will be 100 million in 2100AD, which signifies a ten, fold increase compared to the 1960s (Tamang, 1998).

Systematic urban planning is still only in an embryonic stage of development in Nepal. Urban expansion in Kathmandu and other major metropolitan centers is proceeding rapidly without any effective design control. Recently it was recognized that sanitary conditions are deteriorating rapidly in almost all towns, primarily because of the continued influx of rural poor who set up slum colonies and even start living on pavements in search of livelihood. Municipal bodies are finding it increasingly difficult to cater even to the minimum sanitary need of such immigrants. The poor dwellers of the cities face all the environmental perils of underdevelopment along with those of the development. They live in smoky houses and in the street they breathe air polluted by industries and vehicles. Neighborhood to neighborhood comparisons of income level and toxic waste site location reveal a disturbing pattern. The poorer the neighborhood the more likely it is to be nearer a toxic waste dump. Even in Kathmandu, the houses of the poor are found in areas eschewed by the better off; in flood plains and sometimes in garbage dump containing unknown quantities of toxic materials. Lacking adequate sewerage and water supplies, they drink and bathe in water contaminated with both human and chemical wastes.

One of the important gains made during this period in Nepal is the consensus that has emerged with regard to the major environmental issues, which the country has to tackle. There are three major areas of concern in the current environmental situation: the preservation of species, the control of pollution, and the better management of the country's natural resources of land water and vegetation. It is now widely acknowledged that the most important element in environmental protection is the proper management of natural

resources. However, the situation in this field in Nepal is most alarming. Every year Nepal is losing around 240 million cubic meters of topsoil of the land whose importance for high yields has been well established. The accelerated soil erosion and nutrient loss has resulted in a fast decline in productivity (Pandey, et al., 1995). This fact is reflected by the decreased trend of maize in the hill region (Joshi, 1998) and a decline in yields of rice and wheat crop in Terai region (Regmi, et al. 1996). As well, the demand for fertilizers and pesticides has increased rapidly after the introduction of high yielding variety seeds; 35% of the Terai and hill lands have been affected by acidic problem due to the excessive use of Nitrogen (Manda, 1985). Also it is presumed that the rust disease of paddy is being caused by the application of urea fertilizer.

In the field of forestry, in spite of all the efforts, Nepal's record is frustrating. It is generally accepted that the consumption of forest in Nepal far exceeds the sustainable supply potential. Within a thirty-year period (1950-80) Nepal lost half of its forest cover and the average annual rate of depletion was about 2.1 per cent. The socio-ecological implications of the loss of tree cover is so severe that it has resulted in an unprecedented shortage of fuel for cooking and is forcing people to use cow-dung, whose alternative role as fertilizer has far more value than as fuel. The intensive use and even overuse of forest resources for feed, fuel wood and litter collection due to increased human and livestock population has diminished the availability of organic material (Vaidya et al., 1995) as well as depleted forest soil fertility (Shah and Shreier, 1995). Furthermore, the country's water balance is being badly disturbed and drought seems to be recurring more frequently especially in the spring season when the water availability is poor. With the forest declining and diminishing, fodder and fuel must be fetched from far places using time that would otherwise be spent in income earning activity. Because of this, working days in the field have been shortened, family income has fallen, and diets have deteriorated. As a further result of forest depletion, dung is increasingly burnt as fuel instead of being returned as fertilizer to the soil. It is estimated that about 8 million tones of dung are burnt each year, equivalent to one million tons of forgone grain production. Further, the emission factors for

carbon monoxide, particulate and organic material of the traditional fuels can exceed those of even the driest fossil fuel, coal. Nepalese villages are a good example, where the houses are reputed to contain some of the world's smokiest conditions because of the severe climate condition, and the consequent need for space heating. In combination with this high exposure, lungs disease rates are shockingly high in some areas.

Energy consumption rates to a considerable degree characterize the scale and efficiency of any society's productive forces. To produce energy, Nepal is indeed blessed with a superabundance of water resources. These resources are essential and irreplaceable for human existence, agricultural and industry. Also these resources are not only non-renewable, for which no substitute exist, but also play an important role in supporting all eco-system and landscape. However, as a consequence of the development of water resource projects, the complexity of the fresh water eco-system continuously increasing in structural, spatial and temporal dimensions.

Review of Climate change assessment in Nepal

Developing countries have faced a number of risks and crises, even without climate change. The cause of these crises may be different, but in terms of their consequences and pace of change in some cases, they may have many similarities with climate led changes. Rapid increase in the pressure on land, deforestation and depletion of grazing resources, sinking of the water tables in the well, and the frequent recurrence of drought and floods are some of the changes to illustrate the point. Nepal is no exception, as these events are already active and adversely affecting the production environment and resource base of the country.

Scientists (Barry, 1990; Stone, 1992; Beniston, 1994) have considered the mountain environment itself as a sensitive indicator of climate change. Even in Nepal Himalayas, it was found that many glaciers in this region were shrinking in the last two decades (Miller, 1989; Miller and Martson, 1989; Yamada et al 1992). Because of this, the formation of glacier lakes has been accelerated in recent times and events of glacier lake outburst floods have been quite

frequent in Nepal from 1980 onward. The recent formation of glacier lakes and changes in the position of glacier snouts suggest that these events be caused by temperature rising, which indicates a corresponding change in climate. The glacier recession not only means warming of the climate, but also implies that less and less ice will be available to the river in future. The impact of changing climate can be more severe in mountainous regions due to effect the effect on glacio-hydrological regimes and the resulting impacts on water resources (Collins, 1987;Collins, 1989;Beniston, 1994)

Due to certain irreversible changes that human activities have triggered, our life system seems to be endangered. For example, the evaporation of soil moisture on the treeless slope of the once verdant Kathmandu valley in Nepal, is as high as 190% and the soil temperature in excess of 40 degree Celcius, so that production of humus has ceased and there is total a breakdown of the nutrient cycle and micro-climate equilibrium (Kollmansperger, 1977). It is reported that climate changes may create a situation of water stress in Nepal (Mirja & Dixit, 1997).

The El Nino condition that often results in deficient rain in Nepal has already been found frequently and massively in this century which might have caused the return periods for extreme climatic events, such as flood and drought.

A study of the long-term trend in surface air temperature in India by Hingane et al. (1985) indicated an increase in mean annual temperature of 0.4 degree Celsius over the past century. A study of changes in air temperature of the Tibet Plateau and its neighborhood showed an increase after 1970 (Li and Tang, 1986). Studies on variation in surface air temperature for Nepal have shown that for the period of 1971-1972 there was a warming trend ranging from 0.1 to 0.18 Celsius degree per year in most regions except in Terai (Shrestha et al. 1997). The longest temperature record from the country, the Kathmandu record shows a similar trend indicating support for the larger scale trend. Despite the fact that the climate model predicts an increase in monsoon precipitation, the lack of a long-term increasing trend is alarming. This could be an indication of the countering effects of the recent increase of Atmospheric

sulphate aerosol due to the combustion of fossil fuels in Asia (Shrestha et al 1997).

Environmental Law and administrative institutions in Nepal

The first hierarchical legislative level of any country is the constitution. Hence all legislative policies and other laws have to confirm to the constitutional provisions. With the promulgation of the constitution in 1990, the state has strong commitment towards the goal of environmental protection. Under the directive principle and policies, it states that the state now on "shall adopt a policy to utilize the natural resources of the country in the national interest and in a fruitful manner" (Art. 26(3)). The state "shall give priority attention to conserving the environment of the country and also prevent any adverse impacts on the environments, which may be caused as a result of the implementation of physical development activities, through the mechanism of creating public awareness towards the quality of environment, and shall make special arrangements for the conservation of rare animal species, forest and the vegetation of the country (Article 24(4)).

As well, the new constitution contains a number of other provisions, which may indirectly help to promote the status of environmental considerations within the life of the country. Part 8, Art. 64 of the constitution stipulate that parliament shall constitute a range of special parliamentary committees on environmental protection and assign necessary tasks pertaining to environmental issues. More important is the right conferred by article 88 (2) of the new constitution, where any person can directly move an appeal to the Supreme Court on any issue of public interest or importance, including environmental issues.

Specific Legislation and Institutions

Law responds to a need and generally follows it. In the case of environmental law, however, specific environment-related legislation preceded the adoption of general or organic laws. There were instances when legislation dealing with specific issues developed gradually, or when laws were amended to include environmental dimensions.

Pollution control

Pollution is a problem uniquely amenable to regular control, and a Government's success in combating this widespread threat to environmental quality is an important gauge of the Government environmental efficiency in general.

Nepal has no environmental quality standards and few laws that specifically to deal with pollution, whether it be air, water, noise or land pollution. Despite the absence of heavy industry and the small number of vehicles in Nepal, air pollution is a major environmental problem especially in some urban centers. Though planning documents have emphasized several times the need for legislation to control air pollution, no legal arrangements exist regarding air pollution control. Officially, the Ministry of Population and Environment and the Department of Hydrology and Meteorology (DHM) are the responsible agencies, but neither has the resources or expertise to tackle the problem. The DHM has been unable to monitor air quality because of the lack of necessary equipment.

The Kathmandu Valley Development Authority Act, 1988 contains provisions for air pollution control but this statute remains to be implemented. The Industrial Enterprises Act governs pollution from factories, 1981, which empowers the HMG to issue directives to any enterprises relating environmental pollution caused by the enterprise. The Department of Industry (DOI) can control industrial activities through the use of licenses. A license contains a general provision that the industry should insure that it does not cause any pollution to the environment. Since, Nepal does not have environmental standards to measure pollution, this requirement cannot be implemented. The Industrial Promotion Board Internal Policy Guidelines on the environmental aspects of industrialization (1989) impose controls on the setting of industries so as to minimizes the effect of industrial pollution on the urban environment.

The Aquatic Animal Protection Act (1960) forbids the use of explosive or poisonous materials for catching and killing aquatic life in rivers and lakes. The Canal, Electricity and Water Act (1967)

regulates the use of water for electricity generation and irrigation. However, there is virtually no provision for the consideration of environmental matters, other than a cursory reference in section 11 A to the obligation of those utilizing the water resources to refrain from doing "any act which may cause land erosion, land slides or an adverse effect on the environment". The Act makes no arrangement for water quality monitoring, other than a provision for regulation to be promulgated under section 14(2) regarding the control of water pollution. The Nepal Drinking Water Corporation Act, 1989 also prohibits the pollution of drinking water and stipulates a fine of up to ten thousand rupees for an offender.

Many of the pesticides and insecticides used in Nepal are highly dangerous as they pollute water and air and pose substantial health risks to consumers and environment. However, the Ministry of Health and Ministry of Agriculture and its division of Entomology, Plant pathology, as well as farmers share some interest in pesticides. Hence, to regulate the import, export, production, sale, purchase and use of pesticides, HMG/N enacted the Pesticide Act, 1991.

Land use

Land use legislation is an area of vital importance in Nepal. Without such legislation there is the tendency to condone unregulated development. The result could be an uneconomic utilization of available resources and sometimes-unnecessary hazards to people's health.

In Nepal, the existing Town Development Act, 1988 provides the mandate relating to urban design and planning. Despite this seemingly impressive array of urban planning and development laws, in practice, effective urban planning is largely non-existent and urban development is continuing to fragment traditional communities and spoil their environment. This Act creates a system of Town Development Committees (TDC), which is directed to divide demarcated town development areas into appropriate land-use zone. On behalf of the TDC, the Act empowers the government to acquire any land necessary for town planning.

Improper disposal of solid wastes is also a growing problem in Nepal. The management of solid waste matter is reasonably well served by a legal and institutional framework. In the Kathmandu valley, a Solid Waste Management and Resources Mobilization Center has been established under the Solid Waste Management and Resources mobilization Act, 1987 to regulate waste management activities. However, political displeasure and jurisdictional issues of the two ministries (between Housing and Local development) has rendered the center to remain suppressed and inactive.

The Land Act (1964) introduced a ceiling on land holding, and any excess of these ceilings was to be claimed by the Government from the landlords and redistributed to those in need. The Land (Survey) Act (1962) classifies agricultural land into different categories according to its present cropping practices. The Kharka (pasture) Land Nationalization Act (1973) empowers HMG/N to nationalize the alpine pastureland under traditional ownership, with provisions for delegating the use and management of such land to local village boards. The Tourism Act (1978) is related to the preservation of the natural environment wilderness areas by prescribing certain conservation rules for mountaineering expeditions. This Act is administered by the Dept. of Tourism. Although the Dept. of Tourism has ordered that along certain ecologically sensitive trails, only group treks can be made with a registered trekking agency, there is lack of code of conduct in Act.

Land use practices in Nepal are subject to the Soil and Watershed Conservation Act, 1982, as administered by the Department of Soil Conservation and Watershed Management within the Ministry of Forest and Soil Conservation. This legislation is highly bureaucratic and regularly in form, providing the Government with de facto nationalization power over designated soil conversation or watershed management areas. No recognition is given in the legislation to the role of indigenous system of land management nor for any other form of public participation, other than through government controlled users groups.

Forest

The Forest Act (1961) provides for the prohibition of deforestation, cultivation, harvesting and grazing on, and removal of, products from government forestland. The Forest Protection Act (1967) stipulates provisions with regard to the protection of demarcated forest and afforested areas. The Plant Protection Act (1972) aims at the control and prevention of plant diseases by regulating import and export of plant and allied products. The National Parks and Wildlife Protection Act (1973) provides the protection and management of designated national parks and wildlife reserves, as well as protection of wildlife outside the protected area. The Forest Act (1961) amended as the Forest Act (1977) recognized four categories of forest namely community forest, private forest, Religious forest and leasehold forest except government control forest.

Forestry management has been dispersed over a number of separate government authorities, which has hampered effective administrative coordination. The Department of Forest is primarily concerned with plantation and conservation of forest and licensing and organizing timber sale while the Dept. of National Park and Wildlife Conservation makes arrangements for national parks, protects wildlife and their habitat, regulates hunting, protects, conserves, develops and makes proper arrangements for the use of places of special importance from the viewpoint of natural beauty, in order to maintain the etiquette and welfare for the public.

Mining

Petroleum mining is specifically dealt with by the Nepal Petroleum Act (1983) that requires that all activities associated with the extraction, production and distribution of petroleum and its product be undertaken without causing damage to the forest and other natural resources and without any pollution to the environment. Cursory reference to environmental controls is also contained in the Mines and Mineral Act, 1985. The Department of Mines and Geology is responsible for administering all mining activities.

Cultural heritage

With the expanding the concept of the environment, there is increased recognition of the value of cultural resources and the quality of life. In Nepal, since the early 1950s, legal and institutional mechanisms have been introduced for heritage conservation. Cultural heritage conservation is mainly governed by the Ancient Monument protection Act (1956) that is administered by the Department of Archaeology under the Ministry of Support and Culture.

The Nepal Environmental Policy and Action Plan (1993) developed by the Environment Protection Council, determines policy areas, relevant action and institutional responsibilities under the given five groups:

1) Sustainable management of Natural Resources
2) Population, Health and Poverty
3) Safeguarding national interest
4) Mitigating adverse environmental impacts
5) Legislation, institution, Education and Public Resources

Attempts have been made from time to time to set up institutional mechanisms to coordinate environmental administration. A high level "Environmental Protection Council "(EPC) incorporating ministers of the relevant ministries and experts as well as institutional representatives at the top levels was created under the chairmanship of the Prime-minister, and the Ministry of Population and Environment, is the focal point of the council with the responsibility of functioning as the secretariat of the EPC. As per HMG decision, the Ministry of Population and Environment has the mandate to be primarily responsible for formulating and implementing policies, plans and programs; preparing acts, regulation and guide lines, conducting surveys, study and research; disseminating information and carrying out publicity; monitoring and evaluating programs; developing human resources; and acting as a national and international focal point in the domain of population and environment. The Lower House of Representatives have a

Committee on Natural Resources and Environment Protection which looks after all relevant natural resources and environment related legislation before it is submitted to the parliament

To coordinate environmental activities and to facilitate the implementation of EPC decisions at the ministerial level, EPC has designated focal points at ten ministries. These are:

(i) Housing and Physical Planning,
(ii) Industry,
(iii) Law and Justice,
(iv) Agriculture,
(v) Water Resources,
(vi) Work and Transport,
(vii) Tourism,
(viii) Education,
(ix) Health, and
(x) Forest and soil conservation.

Ministries, commission and council, which are involved in development program and implementation, are also added in EPC list as linkage agencies:

(i) Finance
(ii) Home affairs
(iii) Land reform,
(iv) Local Development
(v) NPC,
(vi) WECS,
(vii) NARC

Environmental desks have already opened in several corporations and departments.

Need of modification and introduction of Environmental Law/Institutions

Though laws pertaining to the environment are piecemeal, the inadequacies of legislation should not be considered a major causal factor in the slow progress towards environmental improvement in Nepal. There is still existing law and regulation, which deal with environmental problems and natural resources but there are scattered in on the statute books. Every ministry gives priority to that statute which is directly related to it and overlooks the application of other statutes, which have relevant, though not direct, link to it. As a consequence, it has resulted in very little cooperation and coordination between line ministries and Departments. Most laws are silent on integrated natural resource management and the content of environmental degradation. Because of this the Forest Act, 1961; National Parks and Wildlife Conservation Act, 1973: Forest Protection Act 1967:Soil And Watershed Conversation Act 1982;Industrial Enterprises Act1979 and Tourism Act, 1978 need thorough revision.

As already stated, there is no law in Nepal, which contains the framework for ensuring air and water quality control, and hence an Act dealing with these problems should be introduced. This Act should have a mandate to establish a Pollution Control Board and the Board should get authority for the licensing of the discharge of contaminants and the import, sale manufacture and distribution of hazardous contaminants. In addition to this, environmental quality standards should be developed immediately involving concerning government sectoral agencies.

Conclusions

The goal of environmental protection has been incorporated into the written constitution and into the formal development plan of Nepal. An impressive array of legislation has been introduced and designed to advance specific aspects of environmental management. The problem, however, is that much, if not most, environmental law remains on the book. Tolentino (1986) has summarized the problems in the following terms:

"Legislation is really not a critical factor in environmental improvement. Legislation does not in practice guarantee that the intent of the legislation will be implemented. The major practical problems result from the difficulty of setting up control and enforcement mechanisms to apply the legal provisions. In the first place, a considerable portion of the laws has never been expressed in regulations. In the second place, the difficulty of establishing effective systems of control and enforcement frequently exceeds the capability of the public sector." Besides, developing countries suffer from an overload of political and economic issues that divert public attention from environmental problems. Hence, while formulating environmental laws in a developing country like Nepal, the solution to the problems of poverty, unemployment, the dual economy, high population growth rates, unfulfilled basic needs, and the other woes of underdevelopment should not be jeopardized.

In Nepal, indigenous systems of environment management have been most frequently applied to the conservation of basic common property resources, notably forests and watershed systems. Hence, there is urgent need to recognize the role of the indigenous system in the governmental system to strengthen the existing system. Study and research is equally important to understand, as well to deal with the problem of climate change. Presently only two agencies, DHM of HMG and the Central Department of Meteorology Tribhuvan University, are involved in carrying out research and study, but due to lack of facilities their performance is not satisfactory. This requires special attention from Government side to facilitate the university to introduce a new course on Climate Change.

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Montreal Protocol on Substances that Deplete the Ozone Layer

Dr. Sita Ram Joshi
Nepal Bureau of Standards and Metrology

The Issue – Ozone Layer Protection

Surrounding the earth at a height of about 25 kms. is a layer rich in ozone. It is called the Stratosphere. This ozone-rich layer prevents the sun's harmful ultraviolet rays (UV-B) from reaching the earth. UV-B rays have an adverse effect on all living organisms, including marine life, crops, animals and birds and humans.

Although the full extent of what harmful UV-B does to other species is not known, in humans it is known to affect the immune system, to cause skin cancer, eye damage and cataracts, and to increase susceptibility to infectious diseases such as malaria.

There is now indisputable scientific evidence that ozone is being attacked and destroyed by man-made chemicals that contain chlorine and/or bromine, which eventually float upwards from the earth's surface to the stratosphere.

The technical names for these chemicals are:

- Chlorofluorocarbons (CFCs)
- Halons
- Methyl Chloroform
- Carbon tetrachloride
- Hydrobromofluorocarbons (HBFCs)
- Hydrochloroflurocarbons (HCFCs)
- Methyl bromide

A simplified version of the main steps in the ozone depletion process is as follows:

- Free chlorine or bromine atoms react with ozone to form chlorine or bromine monoxide stealing the oxygen atom and converting ozone molecules into oxygen;
- Chlorine or bromine monoxide molecules react with free oxygen atoms; giving up their stolen oxygen atom to form more molecular oxygen and free chlorine or bromine atoms.

These chemicals take part in a series of chain reactions leading too zone depletion as in Fig. 1. As the ozone layer thins, higher doses of UV-B radiation reach the earth's surface. This has widespread effects on human health, agriculture and ecosystems in general. These effects include:

- **human skin**: more sunburn and skin cancers
- **human eye**: more cases of cataracts, snow blindness and other chronic eye diseases
- **immune systems**: reduced human and animal resistance to infections and diseases including cancers and allergies, and diseases such as leishmaniasis and herpes where the body's major defense system is skin
- **crops**: smaller plants, lower yields, potential reductions in nutritional value, the need to search for UV-B resistant crops
- **natural ecosystems**: altered plant forms and changes in the competitive balance between plants, the animals that eat them, and plant pathogens and pests
- **marine and aquatic life**: reduced production of phytoplankton, zooplankton, juvenilefish, crabs and shrimps which, in turn, threaten all marine life and reduce fisheries productivity
- **man-made materials**: faster degradation of certain materials including many paints and plastics
- **Increased global warming and climate change**

In general, Ozone Depleting Substances (ODSs) are most often used:

- To clean printed circuit boards and precision parts
- To prevent and extinguish fires
- As refrigerants in refrigeration, air-conditioning, chiggers and other cooling equipment

- As an aerosol propellant
- In the manufacture of foams, including insulation foam in refrigerators, freezers etc
- In a variety of other areas, such as inks and coatings and other medical applications

International Actions Taken to Protect Ozonosphere

When the first evidence of the Antarctic ozone hole was published in 1985, nations concerned about the impending crisis caused by the artificial thinning of the ozone layer, entered into global negotiations which led to the adoption in September 1987 of the "Montreal Protocol on substances that deplete the ozone layer."

But new scientific evidence appearing in the years after the original Montreal Protocol (MP) agreement showed that ozone depletion was more serious than had originally been thought. Thus in 1990 in London, and then in 1992 in Copenhagen, amendments were made to the MP. By the end of 1997, more than 160 countries of which two third are developing countries, had ratified the MP. Its major provisions are:

- Consumption of CFCs, halons, methyl chloroform and carbon tetrachloride will cease at the end of 1995 in developed countries, and by 2010 in developing countries (developing countries are defined as those that use less than 0.3 kg of ODS per capita per year)

- HCFCs, which originally were developed as a less harmful class of CFC alternative chemicals, have also been added to the Protocol. Their consumption will be gradually phased out and cease totally in 2030 in developed countries.

- A Multilateral Fund has been established, to which developed countries contribute. The money is available to industry in developing countries for technical expertise, and for new technologies, processes and equipment to support there ODS elimination programs.

The Challenge for Industry

The impact of the MP in reducing the consumption of ODSs means that industries need to plan for the transition to non-ODS technologies. This transition is a great challenge requiring changes to operating practices in a number of industry sectors including for instance:

- Producers of ODSs
- Refrigeration, air conditioning manufacturers
- Refrigeration and air conditioning maintenance and repair business
- Foam manufacturers
- Aerosol manufacturers
- Suppliers of halon-based fire protection equipment
- Electronics manufacturers
- Various small-scale enterprises using ODSs for cleaning

Overview of the National and Sub regional Environment and Development Issues

Among the SAARC countries excluding Bhutan (which is not yet a party to the Montreal Protocol), all of them have signed the Ratification of the Vienna Convention for the Protection of the Ozone Layer and Montreal Protocol on Substances that Deplete the Ozone Layer as Adjusted and Amended by the Second Meeting of the Parties, London, but the Copenhagen amendment has been ratified by Pakistan, Bangladesh and Sri-Lanka.

Existing Legal/Institutional/Administrative/Management measures for implementing each regime with specific reference to laws/ Regulations/Administrative orders/Circulars

Having ratified the Protocol, the next major milestone for a government is generally the preparation of the Country Program. The Country Program sets out the commitment by the government to take appropriate actions to ensure compliance with the Protocol and it is usually the first step to obtain financial assistance from the

Fund for investment projects and institutional strengthening projects since successful implementation of phase-out of ODS depends on effective institutional mechanisms set out under the Country Program.

The key required features of the country program are:

- An analysis of the current situation with regard to the production and consumption of ODSs in industry, including projections of unconstrained demand for ODSs;

- A statement of the actions already taken by government and industries aimed at reducing ODS use;

- A strategy statement by the government defining the phase-out time table for each substance and the rationale behind this;

- The government actions to be taken in support of achieving phase-out in accordance with the time table, and the institutional arrangements for taking these actions; and

- A prioritised list of projects being, or to be, undertaken in producer or user industries to support phase-out.

India

A detailed India Country Program for phase-out of ODS was prepared in 1993 to ensure the phase out of ODS according to the national industrial development strategy, without undue burden to the consumers and the industry. The main objectives of the Country Program are given below since India commonly produces and uses seven of the 20 substances controlled under Montreal Protocol.

- minimize economic dislocation (economic feasibility, energy efficiency and machine characteristics);
- maximize indigenous production (transfer of technology and local production of substitutes and equipment);
- Preference to one time replacement;

- decentralized management (awareness building, training and consumer protection);
- development of standards and certification system (including those for safety) and
- minimize obsolescence.

The production and consumption of Ozone Depleting Substances in India during the last three years are summarized in Tables 1 and 2.

Table 1

ODS	*1995*	*1996*	*1997*
CFC-11	6,607.5	7,282.0	8,635.0
CFC-12	15,176.0	15,176.0	15,024.0
CFC-113	162.0	2.0	-
H-1211	77.3	100.2	106.0
H-1301	1.0	0.5	0.3
CTC- MCF	7,968.0	12,101.0	15,718.0

Table 2

	1991		1995		1996		1997	
	ODS MT	ODP MT	ODS MT	ODP MT	ODS MT	ODP MT	ODS MT	ODP MT
CFC–11	1900	1900	2,533.5	2533.5	2756.0	2756.0	2984.0	2984.0
CFC–12	2850	2850	3,740.0	3740.0	4159.9	4159.0	3710.0	3710.0
CFC–113	320	256	154.0	123.2	28.0	22.4	12.0	10.0
H–1211	550	1650	45.3	135.8	45.6	136.7	77.0	233.0
H-1301	200	2000	20.6	206.0	0.5	5.0	0.25	2.5
CTC	4000	4400	2829.0	3112.0	7978.0	8775.8	---	7875.0
MCF	550	66	1358.0	162.9	1415.0	169.8	NA	NA
TOTAL	10370	3122	12646.4	12175.9	16382.1	16024.7		

Ministry of Environment and Forests (MOEF) had set up Ozone Cell as the national unit to look after and to render necessary services to implement the Protocol and its Ozone Depleting Substances (ODS) phase-out program in India. MOEF established a Steering Committee supported by three Standing Committees, responsible for the implementation of the Montreal protocol provisions, the review of various policy and implement option, project approval, project monitoring etc. The Pollution Control Boards, financial institutions involved in the implementation of ODS phase-out projects, industry associations and concerned Government. Departments were brought on a single platform through the mechanism of a Monitoring Standing Committee to monitor ODS phase-out. Further, disposal of old equipment in an ozone-friendly way was mandated in legal agreements that were to be signed for implementation of approved projects. Annex A and B substances were brought under the ambit of licensing for the purpose of both imports and exports. Exports of CFCs to non Article 5 countries were banned. All exports of CFCs to Article 5 countries were to have the label "New produced CFCs". Draft notification banning the use of CFCs in new investments in the aerosol sector was published. Comprehensive regulations on ODS phase-out were ready for publication in Official Gazette inviting public comment. Further, draft comprehensive regulations on the Ozone Depleting Substances Rules 1998 has been published in the gazette of India for public comments. The important provision of the ODS rules is the compulsory registration for ODS producers, exporters, importers and stockers etc with MOEF.

Bangladesh

The largest ODS consuming sector in Bangladesh is the aerosol sector. The second one is the refrigeration and air-conditioning servicing sector. In compliance with the provisions of the Montreal Protocol, the Government of Bangladesh undertook a reconnaissance study on the use of ODS in the country in early 1993. Based on the study, a detailed country program was prepared in 1994. In accordance with the country program, four project proposals were submitted to the Montreal Protocol Multilateral Fund for financial assistance (Table 3)

Specific legislation has to be enacted for control, regulation and ultimate banning of import and the use of ODSs in Bangladesh within a stipulated period. In this respect an Economic Consultant was appointed to formulate an action plan compatible with existing trade and commerce as well as the socio-economic situations of the country. The economic consultant has submitted the Final Draft report on Phase out of Ozone Depleting Substances in Bangladesh: Economic Implication and Policy Issues. Appointment of a local legal consultant is underway to formulate laws and regulations for phase-out of ODSs in Bangladesh.

Sri Lanka

Sri Lanka does not manufacture any type of ODS nor does it export any of them. The major application of ODS in Sri Lanka is in refrigeration and the air-conditioning sector. The Montreal Protocol Unit (MPU) was established as an Institutional Strengthening Project as proposed in the Government Action Plan (Country Program) in the Environment Division of the Ministry of Forestry and Environment on 01.07.1994. Data on the consumption of Ozone Depleting Substances (ODS) during 1996 were collected by MPU from the importers and the set of data submitted to the Ozone Secretariat is given in Table 4.

Table 3

Year	Name of the ODSs	CFC-11 (MT)	CFC-12 (MT)	Freons-123(CFC -123) (MT)	R-500 (MT)	HCFC-22 (MT)	Carbon tetra-chl-oride (MT)	Methyl chloro-form(MT)	TotalCon-sumpt-ion(MT)	Total import(MT)
1995	CFC-11, CFC-12, Methyl chlor-oform, Carbon tetra chlo-ride	82.6	178.9	--	--	35.2	7.0	2.1	305.8	328.3
1996	CFC-11, CFC-12, Methyl chlor-oform, Carbon tetra chlo-ride	264.2	342.7	5.0	1.1	72.7	1.83	--	686.6	692.3

Several regulations were gazetted by the Minister of Internal and International Commerce and Food at the request of the Ministry to bring the import of ODS under a licence scheme. CFCs and HCFCs were included in a gazette notification dated 8.11.96 and the 3 substances, carbon tetrachloride, methyl chloroform and methyl bromide were included in a gazette notification dated 24.12.1997. Similarly, regulations were gazetted to bring the import of used refrigerators, freezers and air conditioners under a licence scheme on 17.6.1996.

Table 4

Substance	CFC 11	CFC 12	CFC 115	CFC 132	HCFC 22	CTC	MCF	MeBr
Tonnes	67.91	415.89	23.40	5.05	231.87	39.67	37.46	13.82

Bhutan

The small amount of ozone-depleting substances used is usually in refrigeration, fire protection and a negligible amount in solvents. The quantity is highest in refrigeration. The use of aerosols and foams are not common. Although there is certainly some amount of ODS being consumed in refrigeration purposes, there are no special records reported of how much is being used.

The policy of the Government is that any project must be environmentally friendly. A step taken to ensure this is the process of developing the Environmental Quality Standards by the National Environment Commission. This will ultimately be incorporated into the Environmental Protection Act.

Pakistan

The details are presented in Appendix 1.

Maldives

The details are presented in Appendix 2.

Nepal

The government of Nepal ratified the Montreal Protocol on Substances that Deplete the Ozone Layer in 1994. Nepal depends heavily on refrigeration and air-conditioning which are required for key segments of its economy-preservation and transport of food and tourism. Many refrigeration and air-conditioning systems contain CFC-12. Nepal's current consumption of Annex A CFCs is 0.0013 kg per capita, hence, it operates under paragraph 1 of Article 5 of the Protocol and is eligible for assistance from the Multilateral Fund.

Nepal does neither manufacture any ODS controlled under the protocol, nor does it export ODS. A 1996 survey of ODS consumption in Nepal found that 29 tons of CFC-12 and 23 tons of HCFC-22 were consumed in Nepal during that year. Approximately 1.0 ton of CFC-12 is used in new equipment, and the balance 28 tons is for servicing. ODS consumption in Nepal is presented in Table 5.

Since the government is committed to its obligations under the MP, it will ensure that the consumption of CFC will be reduced to zero by the year 2010. To achieve the phase-out timetable, the Government has based its Action Program on the following elements:

- Restrictions and Import bans – of CFC and CFC based equipment and products

- Higher (import and excise taxes) for CFC- to provide an economic signal to the market to preferentially adopt non-CFC chemicals and equipment

- Public and Industry Awareness- will ensure support of the Country Program and co-operation of the Action Plan, and will be targeted at the public and industry so that they are informed as to the implications of the CP, and their role in ensuring the success of the Action Plan

- Strategic Planning- to ensure that all the technical and practical issues in changing over commercial and industrial refrigeration and air conditioning systems are identified and that a plan on how to address these issues is developed, together with a plan to manage the supply of the post-phase out tail
- Training and Information Exchange- is important to ensure that the local industry can install and service new systems that use CFC alternative gases

Table 5

Estimated use of CFC in Refrigeration and air-conditioning sector in 1996 by sub-sector

User Sector/Use	**Substance**	**Application**	**Use in ODP tons 1996**
Domestic Refrigeration	CFC 12 CFC 12	Servicing Production	15.82 0.19
Sub-total			16.01
Commercial Refrigeration	CFC 12	Servicing	2.34
Sub-total			2.34
Domestic and Large A/C	CFC 12	Servicing	7.69
Dairy	CFC 12	Servicing	3.01
Sub-total			10.70
Total			29.05

- Registration- will ensure that CFCs can only be purchased and used by service people who have been able to demonstrate that they are able to minimize avoidable emission of CFC to the environment
- Institutional Strengthening- will ensure that the implementation of the CP will be co-ordinated and will be directly responsible for aspects of implementation

Summary of Projects being submitted with the Country program is presented in Appendix 1.

Adequacy or inadequacy of the existing arrangement examined above

India

- On-going funding support not available to other Government Department, except Ozone cell
- Small Scale/informal sector has unique features, and hence funding criteria should be different
- Many medium and small enterprises do not qualify for funding assistance, according to the present cost effectiveness threshold limits being applied for approval
- Delays in completion of phase-out projects by implementing agency even after major portion of financial assistance is disbursed

Bangladesh

"Institutional Strengthening for the Phase-out of Ozone Depleting Substance in Bangladesh" was implemented in March 1996 and completed by February 1999. The plan includes implementation of ODS phase-out activity and its subsequent monitoring and hence, necessitate the extension of the project for a subsequent period of two years, in line with the decisions of the 19th Meeting of the Executive Committee of MLF. As per survey report of 1996, it was observed that about 2.2 million commercial and domestic refrigerators containing CFCs are in use throughout the country. Developing countries like Bangladesh can hardly afford to discard such a large number of refrigerators. Therefore, facilities for recycling of ODS need to be provided with support from MLF to prevent their leakage to the atmosphere. Further, as the refrigeration and air-conditioning servicing shops generally lose 18% of ODS during their servicing; these difficulties will be removed if the project entitled "Training for Refrigeration and Air conditioning Service Sector" will be approved by MLF.

Sri Lanka

All of the projects, namely Alternatives to Methyl Bromide in Tea Plantations; Retrofitting of Refrigerators with Alternatives; Eliminating Carbon Tetrachloride in the Activated carbon Industry; Elimination of CFC at the Aerosol factory and Elimination of CFC at the two Refrigerator Factories, have been funded by MLF and are in progress. Among them, the aerosol factory is still unable to locate a supplier for dimethyl-ether, which is the alternative hydrocarbon to be used. Further, a project proposal for halon banking is necessary since 390 kg of Halon 1211 and 645 kg of halon 1301 are being used in fire extinguisher systems in the country.

Bhutan

The main constraint in the assessment of ODS in Bhutan is the lack of information. The National Environment Commission in future has to take every possible effort in gathering information, keeping in view the importance of the subject. Deploying technical experts since there is a shortage of trained manpower in the country can do the gathering of information.

Nepal

The refrigeration sector is the most important ODS consuming sector in almost all developing countries. The smaller the country's total consumption, the larger the proportion accounted for by refrigeration. Further, low volume consuming countries (LVC) import all ODS and ODS containing products for local markets. They face particular difficulties in phase-out because of problems such as a weak institutional set-up, limited technological expertise and difficulties in regulating a large informal service sector with poor equipment and unskilled personnel. The refrigeration industry estimates that about 1/6 of the worldwide CFC use in the refrigeration sector could be reduced through proper servicing and maintenance practices. In LVC countries, nearly all CFC consumption is devoted to servicing existing refrigeration systems. There is high potential to reduce CFC consumption by preventing unnecessary emissions in servicing.

Further, it has been indicated by the service industry of Nepal that

as most of the problems requiring system opening up are caused by leakage of refrigerant and burnout compressor wiring, it is not practical to try to reclaim R-12 from the type of predominant systems in use in Nepal. The refrigerators and similar equipment imported from Japan, Singapore etc are already equipped with R-134a instead of the conventional R-12.Therefore, R-134a as such, and it is not new to the technicians here. However, there are different technical and commercial issues that should be sorted out. Hence the industry personnel should have exposure and training in the following and other allied areas in order to enable them to use the alternate refrigerant R-134a with professionalism and confidence:

- Familiarity with R-134a. That means familiarity with its thermodynamic properties.
- Handling of new refrigerant.
- Handling of synthetic oil necessary with R-134a.
- Effects of retrofitting hermetically sealed compressors designed with R-134a.
- Performance test of R-134a with respect to electricity consumption.
- Use of new charging tools.
- Safety issues involved with R-134a.
- Calibration of pressure gauges and knowledge of S-1 unit of pressure.
- Conversion from convention to new system.

Suggestion for enhancing the effective and efficiency of implementation of each regime including:

- Reinforcement of legal measures
- Strengthening institutional arrangements
- National, provincial and local co-ordination
- Capacity-building and awareness

At present there is a total lack of awareness of the ozone depletion problem, both among the governmental sector and private sector managers in particular, and public in general. Further, in order to realize the time target set for the phase-out of ODS, it is necessary to strengthen the existing institutional mechanism, but for many governments the phase-out of ODS is a relatively low priority in

the context of the other demands on the government's resources. Moreover, many developing countries lack the experienced technicians, policy analysts, and managers needed to formulate and administer ODS phase-out programs. There is a necessity to introduce control measures for importing and retailing of ODS, which is presently done without any restrictions.

In view of the above constraints, the need to strengthen institutional capability through Institutional Strengthening Projects in Article 5 countries has been recognized by the executive committee as a critical factor in achieving successful phase-out of ODS in these countries. Institutional Strengthening in Article 5 countries intends to provide the capacity for:

- Preparation of proposals for policies, strategies, laws, regulations, incentives, agreements with the private sector and other measures required for phase-out;
- Enhanced capacity and actions to provide a suitable climate in the country for the expeditious phase-out of ODS;
- Increased co-ordination, promotion and monitoring in country activities for phasing out of ODS;
- Enhanced facilitation in the exchange of information with other parties and organs established by the Protocol;
- Organization of public awareness and training programs;
- Improved collection, analyzing and disseminating information systems on issues involved in ozone layer protection; and
- Improved reporting systems on national data on ODS consumption.

The funding could be available for an initial three year period, subject to review and possible renewal for further two years period on the basis of the performance of the Country Program, the continuing needs of the country and the policy of the executive committee. Phasing out of CFCs on a planned schedule in developing countries is by year 2003 for new applications, and by year 2010 for servicing existing equipment. Hence, funding should be made available for most of SAARC countries so long as there are implementing projects for converting to alternative substances as well as recycling and recovering projects for concerning controlled substances.

United Nations Convention on Biological Diversity Opportunities for Sustainable Use and Benefit Sharing

Madhav Ghimire, Ph.D. [1]
B. K. Uprety [2]

Nepal has continued its participation in a number of international events that are related to the conservation of all life forms. These events turned into the development of a number of legally binding and non-binding instruments for the conservation of biological resources. Benefits from the conservation of all life forms prompted Nepal to be a Party to various legally binding international instruments. Convention on Biological Diversity is one these instruments. This paper deals with Nepal's effort for the implementation of the Convention on Biological Diversity.

The paper is divided into six sections. First section describes Nepal's plant and animal biodiversity. Problems with biodiversity conservation are explained in the second section followed by an introduction to the Convention on Biological Diversity. National initiatives are detailed in the fourth section wherein policy, legislation, institutional framework, human resources, and national action plan are discussed at grater length. Gaps in the initiative are analyzed in the fifth session. Finally recommendations are discussed in areas like policy and legal measures, Institutional Strengthening and Coordination, and capacity building.

Biological Diversity

Nepal is rich in species diversity. The country has about 0.03 percent of the total landmass of the world, but it provides habitat for about 2 percent of flowering plants, 3 percent of peridophytes, and 6

1 Joint-Secretary and Chief of the Environment Division, Ministry of Population and Environment, Kathmandu

2 Associated with the Department of Plant Resources, Ministry of Forests and Soil Conservation, Kathmandu

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percent of bryophytes of the world's flora. Species diversity in lichens and fungi are also notable (Table 1). In addition, 246 species of the total flowering plants, and 248 species of non-flowering plants reported to be endemic to Nepal. Scientists estimate about 7000 species of flowering plants in Nepal's Himalaya. A total of 5833 species of flowering plants, and 4216 species of non-flowering plants have been recorded so far.

Table 1 **Nepal's Share in Plant Species**

(In number)

Groups	Families	Nepal			World Species	Nepal's share (%)
		Genera	Species	Ende-mic sp.		
Algae	50	150	687	13	>40,000	1.72
Fungi	80	552	1,822	150	>70,000	2.38
Lichen	30	79	471	48	>17,000	2.77
Bryophytes	78	180	853	37	>14,000	6.09
Peridophytes	31	103	383	-	>12,000	3.19
Flowering plants*	213	1,496	5,833	246	>2,50,000	2.07

Note: * Angiosperm and gymnosperms
Source: Uprety, B.K., 1998.

Nepal is also rich in ecosystem diversity. A total of 118 ecosystems, 75 vegetation types and 35 forest types have been identified so far. Based on the diversity in ecosystems, the number of endemic, threatened and endangered species, Nepal is on the 25th position from the top in the global context of biodiversity (NBAP, 1998).

Similarly, Nepal is also comparatively rich in faunal species. The country possesses over 4.3 percent of mammals and 8.5 percent of bird's species of the world's population (Table 2). Two species of birds and one species of mammal are endemic to Nepal.

Table 2. **Nepal's Share in Animal Diversity**

(In number)

Groups	Biological species		Nepal's share(%)	Endemic species
	World	Nepal		
Arthropods/insects	>1,000,000	5,052	0.44	4
Butterfly		645		29
Moth		>6,000		
Other than insects	>190,000	144*		108
Fresh water fishes	>85,000	185	0.21	8
Herpetofauna				
Amphibians	>4,000	43	1.07	9
Reptiles	>6,500	100	1.53	2
Birds	>9,881	847	8.57	2
Mammals	>4,327	185	4.27	1

Note: * Spiders only

Source: HMG, 1997.

Nepal's climatic variations in agro-ecological zones also favor diversity in crops and domesticated animals. An estimation indicates over 400 species of agro-horticultural crops. Out of them, about 50 species have been domesticated for commercial and household consumption. Seasonal fruits harvested from forests belong to about 37 genera and 45 species. In the case of potato, about 11 species are local varieties. Present levels of exploration indicate the Eastern Nepal richer in germplasm than the Western Nepal. Nepal Agriculture Research Council (NARC) has stored germplasms of various crops - cereals, grain legumes, oil seeds, vegetables, industrial crops and spices crops and the accession totals to about 8,400. At present, 153 varieties of different crops have been registered for cultivation in Nepal.

Nepal also has a broad genetic base of livestock breeds. About 24 breeds of indigenous genotypes of cattle (*Yak, Lulu, Kirko, Achhame, Lime*, and *Parkote*), goat (*Chyangra, Sinhal*, and *Khari*) and sheep (*Bhyanglung, Baruwal, Dorel*, and *Kage*) have been reported. They are low in number but they should deserve special attention for species conservation (NBAP, 1998).

Nepal could be considered a meeting point of several species of flora and fauna. *Speciation* (emergence of new species) is favored in Nepal because of its distinct latitudinal and climatic variations, and its location at the junction of the Palearctic and Oriental biogeographical regions with a number of isolated localities.

Problems with Biological Species Conservation

Biological species are faced with great pressure at the national and regional levels. They are the main source of food and proteins, hence in high demanded to meet the basic needs of the growing population. Deforestation, shifting cultivation and expansion of natural forest areas for cultivation have increased the loss of biodiversity. Illegal collection of commercially valued plant and animal species is also a major factor of species loss. Wild animals are in pressure from hunters who illegally collect fur, skin and meat without considering the population and habitat. In addition, development activities have either been implemented in or pass through natural habitats, thereby damaging various numbers of species. Some species may have been lost even before there ecological, economic and scientific importance were known. Human activities are dramatically increasing and have threatened the existence of biological species.

In summary, factors that contribute to the threat or even loss of biological species can be list as:

- Increasing population and high rate of poverty;
- Sectoral development activities and inadequate integration of species conservation in development planning and implementation;
- Inadequate implementation of existing policies and legislation;
- Inadequate awareness;
- Human greediness and arrogance;
- Inadequate empowerment of the local custodians for species conservation and sustainable utilization;
- Lack of a mechanism for the transfer of income generated from species to their conservation;
- Inadequate focus on ecosystem management; and
- Inadequate human resources on dynamics of ecosystems.

Species conservation has not been a part of economic planning in the developing world. It has largely been used for income generation. Stakeholders are unaware of the importance of species conservation and their roles in ecosystem maintenance. They are also unaware on why to conserve species and in what ways. Unless different stakeholders understand what the country possesses and what to conserve on priority basis, species conservation will continue through *ad hoc* programs.

The government institutions are investing in the exploration and scientific study of biological diversity; they are not adequately looking into the commercial value; the users also do not invest in research and development of the biological species. For example, a significant quantity of taxus resin (lauth salla -*Taxus baccata*) has been exported from Nepal in nominal revenue.

The Convention

Nepal signed the Convention on Biological Diversity (CBD) during the Earth Summit in Rio de Janeiro on 12 June 1992, and ratified it in the fall of 1993. The Convention entered into force 29 December 1993 at the global level and since 21 February 1994 in Nepal. The objectives of this Convention are:

- the conservation of biological species;
- the sustainable use of its components, and
- the fair and equitable sharing of the benefits arising out of the utilization of genetic resources.

These objectives were convincing elements to Nepal for its ratification as they promote sustainable use and benefit sharing rather than traditional approach of conserving (protecting) the species. Unlike other Conventions, this Convention calls the Parties to conserve the species and to utilize them on a sustainable basis for socio-economic development. This provision may substantially assist to poverty alleviation - one of the major factors to the loss of biological species.

In short, the Biodiversity Convention encourages Parties to conserve and utilize the species on a sustainable basis, and calls to adopt measures for a fair and equitable sharing of benefits.

The Convention contains 42 articles and 2 annexes. The Convention encourages Parties to conserve and utilize their resources in accordance with the Charter of the United Nations and the principles of international law (Article 3). It calls the Parties to develop national strategies, plans and programs for the conservation and sustainable use of biological diversity, and integrates biodiversity conservation into sectoral and cross-sectoral plans and programs (Article 6). Nepal has to formulate policies, enact and/or amend legislation and strengthen institutions for the implementation of activities to meet the objectives of the Convention. As a Party to this Convention, Nepal has to implement various activities (Table 3).

Table 3. **Major Obligations to the CBD Parties**

No	Article	Major Provisions	Remark
1	6	Develop national strategies, plans and programs and integration of biodiversity aspects into sectoral and cross-sectoral plans, policies and programs	Sectoral policy focus in place
2	7	Identify and monitor ecosystems and habitats, indicator species and communities, and genes of social, scientific and economic importance	Ecosystems identified, few species described
3	8	Establish a system of protected areas (PAs), promote the protection of ecosystems, and promote ESSD adjacent to PAs, preserve and maintain knowledge, innovations and practices of indigenous and local communities, and encourage	PAs established, benefit-sharing introduced in PAs and community forests

		equitable sharing of benefits arising from the utilization of such knowledge, innovations and practices for *in situ* conservation	
4	9	Establish and maintain facilities for *ex situ* conservation, adopt measures for recovery and rehabilitation of threatened species, and regulate collection of biological resources from natural habitats	Some species conserved in zoo, botanical gardens and conservatories
5	10	Integrate conservation and sustainable use of biological resources into national decision-making, develop methods for sustainable use	
6	12	Establish and maintain programs for scientific and technical education and training, promote scientific research	Scientific research introduced
7	13	Promote public education and awareness	Public awareness on biodiversity conservation emphasized
8	14 & 17	Introduce EIA for projects that are likely to have impacts on biodiversity, promote notification, exchange of information and consultation timely, and promote national arrangements for emergency response to activities that impinge on biodiversity	EIA introduced, and emergency response weak

9	15	Endeavor to facilitate access to genetic resources through prior informed consent of the Contracting Parties, and develop necessary legislative, administrative or policy measures	
10	19	Adopt legislative, administrative or policy measures for biotechnological research, adopt practical measures for benefit-sharing arising from biotechnology on a fair and equitable basis	Adoption of biotechnology new to Nepal
11	26	Present a national report on measures adopted	First national report submitted

Source: Text and Annexes of the Convention on Biological Diversity.

National Initiatives for CBD Implementation

The CBD is a blue print for action adopted by the international community for the conservation and utilization of biological resources. It also encourages and obliges the Contracting Parties to implement activities at local, regional and national level for species conservation. Unlike other Conventions, which focus on species conservation, this Convention provides a basis for socio-economic development in the developing countries that have commercially valued species. Successful implementation of the Convention will also substantially contribute to poverty alleviation - one of the major factors to the loss of biological species.

Nepal has prioritized species conservation through policy and legislative measures before and after 1950. Emphasis has been given

to the conservation of wild species in greater depth. Wild species have been conserved in about 42 percent of the total land area and domesticated species are used for crop production, and products of livestock.

HMG has declared 16 protected areas (8 national parks, 4 wildlife reserves, 3 conservation areas, and 1 hunting reserve) for *in situ* conservation of biological resources. Wild species are also conserved outside the protected areas through general forestry administration. The Central Zoo is involved for *ex situ* conservation of endangered mammals and birds, and botanical gardens and conservatories have been established in Ilam, Makawanpur, Banke, Salyan, Kailali and Jumla for both *in situ* and *ex situ* conservation of important plant species of different ecological regions. Various projects have been implemented in the protected areas, particularly for the conservation of wild animals.

Biodiversity conservation-friendly policies have been formulated since the early 1970s and programs implemented in different ecological zones. The following sub-sections briefly describe policies, legislation, administrative and management measures.

Policy

HMG started economic development planning in the mid-1950s. Each plan includes policies for species conservation and utilization. After one decade, the periodical policies emphasized wildlife conservation and HMG started declaring protected areas (national parks and wildlife reserves) for the protection of endangered wildlife. Major policy initiatives are presented in Annex 1.

HMG has formulated biodiversity conservation policies, for the first time under the forestry sector policy in the current plan (Ninth Plan). It recognizes the national obligations of the Biodiversity Convention and includes the following policies:

- Ensure conservation of endangered plants, wildlife habitat, wetlands, wild genetic diversity scientifically;
- Implement international conventions related to biodiversity conservation;

- Continue joint effort for biodiversity conservation effectively;
- Prepare and implement National Biodiversity Action Plan;
- Establish and expand PAs in representative ecological zones;
- Adopt measures for biodiversity conservation by evaluating the impacts of legally protected species, and species included in the CITES appendices;
- Implement mitigation measures to minimize adverse impacts during the utilization of biological species; and
- Adopt measures to utilize non-timber forest products in the PAs.

In recent years, HMG has formulated policies to favor the implementation of species conservation programs with people's participation. There is a significant shift in policy from state-controlled management of species to people-centered conservation. There is a growing recognition for the conservation of species by promoting private and public institutions, NGOs and CBOs. The policy shift has encouraged different stakeholders to re-emphasize biodiversity conservation. Species conservation policies are included in various documents (Table 4).

Table 4. Major Policy Documents on Biodiversity

1. *Periodical Plans (e.g. Ninth Plan)*
2. *National Forestry Plan, 1976*
3. *National Conservation Strategy, 1983/1988*
4. *Master Plan for Forestry Sector, 1989*
5. *Nepal Environmental Policy and Action Plan, 1993*
6. *Agriculture Perspective Plan, 1995*

Legislation

HMG has enforced legislation that favors the management of biological species. Legislation enacted or amended after the reinstatement of democracy in 1990 and ratification of the Biodiversity Convention in 1993 has greatly emphasized species conservation.

The Constitution of the Kingdom of Nepal 1990 states the need for protecting wildlife. Article 26 (4) of the Constitution states that:

> *The State shall give priority attention to the conservation of the environment .... and also make special arrangement for the conservation of rare animal species, the forests and the vegetation of the country.*

HMG started enacting legislation for species conservation after 1950s. The legislation emphasizes wildlife management. Plants were conserved as a part of habitat improvement until the late 1980s. The Forest Act, 1993 recognized the need for conserving selected plant species without detailed knowledge on their status. Several pieces of legislation contain provisions for species conservation (Table 5 and Annex 2).

Table 5. Major Legislation on Biodiversity Conservation

1. *Aquatic Life Protection Act, 1961*
2. *Plant Protection Act, 1972*
3. *National Parks and Wildlife Conservation Act, 1973*
4. *Soil and Watershed Conservation Act, 1982*
5. *King Mahendra Trust for Nature Conservation Act, 1982*
6. *Forest Act, 1993*
7. *Environment Protection Act, 1996*
8. *Shivapuri Watershed and Wildlife Reserve Development Board (Formation) Order, 1984*
9. *Central Zoo Development Board (Formation) order, 1989*

Legal protection for selected plant species was accorded after the implementation of the Convention in Nepal. Some species have also been proposed for legal status. HMG has legally protected 13 species of plants under the Forest Act, 1993. Twenty plant species which occur in Nepal are included in the CITES appendices. Thirty-eight species of wild animals (26 mammals, 9 birds and 3 reptiles) are considered threatened as per the National Parks and Wildlife Conservation Act, 1973. All of them are included in the CITES appendices except striped hyena, and common crane.

The new legal regime on protected areas has also ensured a benefit-sharing mechanism. Thirty to fifty percent of the total revenue generated in the park and reserves will be legally allocated for community development as per the provisions contained in the National Parks and Wildlife Conservation Act, 1973 (amendment in 1993). The Parliament has also recently amended the Forest Act, 1993 (amendment 1999) and has included provisions to invest at least 25 percent of the total income generated in the community forests for the development and management of such forests. The operational forest management plan has also accorded priority to biodiversity conservation.

There is a clear shift in legislative provisions in the protected areas and community forests for species conservation. Emphasis has been given for the development, conservation, management and sustainable use of biological resources. However, the issue of fair and equitable sharing of benefits has yet to materialize by defining these terminologies.

Institutional Framework

Biodiversity has been a "sexy word" and non-professionals have been using this word more than the professionals do. Accordingly, institutions have been established and strengthened at both governmental and non-governmental level for biodiversity conservation.

HMG has established two prominent institutions for biodiversity conservation. The Ministry of Forests and Soil Conservation (MFSC), which is involved in conserving wild species, and the Ministry of Agriculture (MOA) which deals with domesticated species. MFSC has ensured *in situ* conditions by establishing a network of protected areas at about 16.5 percent of the total area of the country. Wild species are also conserved in the zoo, botanical gardens and conservatories. MOA has focused its activities in farmland and genetic resources for their *ex situ* conservation.

Ministry of Population and Environment (MOPE), a government institution was established in 1995 exclusively for environment-related functions - both green and brown sectors. The responsibilities

constitute, *inter alia,* environmental conservation including biodiversity conservation, pollution control, policy analysis and legislation, environment and social impact assessment, environmental standards, and cooperation with other institutions in executing their programs and activities on environment. Since the Environmental Protection Council (EPC), an advisory and policy coordinating body, is housed at MOPE, MOPE can effectively oversee and coordinate CBD implementation within its resource limitations.

HMG established a National Biodiversity Steering Committee in July 1997 for inter-sectoral coordination. The Committee comprise of representatives from the forestry organizations, agriculture, and environment at the government sector, INGOs and national NGOs. The Committee oversees CBD implementation at the national level. The National Biodiversity Unit, housed in the Ministry of Forests and Soil Conservation, serves as the Secretariat of the Committee.

Various organizations involved in biodiversity conservation, inventorying and scientific research, cataloguing, and management are enumerated in Annex 3. A number of academic institutions, NGOs and CBOs are also actively involved in this endeavor.

At the community level, over six thousand community user groups are involved in managing forests and wild biodiversity. User groups have also been formed for buffer zone management and watershed conservation.

Human Resources

Nepal has a moderate number of knowledge-based human resources for species conservation. MFSC and MOA are the two professional and technical institutions in HMG for policy and decision-making. Both institutions have staff trained in developed countries that are competent to deal with this subject.

Human resources mobilization, however, is a challenging task in the bureaucracy. Mycologists deal with sometimes issues related with phycology, and opinions and suggestions of the non-

professionals are rewarded in the program planning and decision-making process.

Another policy level organization is MOPE, which has a conservation mandate, but has shortage in manpower.

National Biodiversity Action Plan

HMG has continued the implementation of various programs for biodiversity conservation. The forestry and agriculture institutions implement several projects and programs. HMG has drafted the National Biodiversity Action Plan (NBAP) with the objective of providing a systematic and strategic approach to biodiversity protection in accordance with the Convention on Biodiversity. In order to meet the objective, a number of priority programs have been proposed in the areas of agriculture, community forests, livestock genetics, rangeland, wetland, non-timber forest products, protected areas and special areas (Annex 4). NBAP calls for the management of forests, agriculture, livestock, water resources and rangeland for biodiversity conservation.

NBAP proposes special programs particularly to address the cross-sectoral issues on biodiversity. Similarly, NBAP programs are proposed for implementation in three different phases with sets of priority programs. It is hoped that the implementation of the proposed programs through stakeholder participation will ensure the conservation and sustainable use of biodiversity in the spirit of the Biodiversity Convention.

Gaps on Initiatives

The current approach of wildlife protection by declaring an area in the form of national park, wildlife reserve, hunting reserve or the conservation area has individually or collectively guaranteed species conservation. However, wildlife density, habitat requirements and a species action plan, particularly for endemic and endangered species, are lacking. Plant species in the protected area network are protected not because they merit conservation but because they provide habitat for wild animals.

Most of the biological species are conserved without knowing their requirements, ecological behavior, and their role in maintaining the varied ecosystems. Nobody knows how many plant and animal species are in a given area and which of the species deserve serious attention for protection. In this regard, the policy seems silent. The policy has not recognized the ecosystem as a unit for species conservation.

With regard to agriculture biodiversity, emphasis is given on utilizing some highly valued species thereby promoting the possibility of genetic erosion and transformation through developing hybrid varieties.

Legislation on forestry and protected areas are adequately enforced in Nepal. Various provisions contained in the legislation are directed to penalize the individual(s) who do not comply with the law. Laws are not applicable to persons who enforce the law. The Forest Act provides a person an opportunity to function as development facilitator (implementor), a police and a judge at the same time.

The Environment Protection Act has been enforced since 1997. Lack of supportive databases, infrastructure, and internalization problems has hindered its effective implementation. Biodiversity and environmental conservation have otherwise gotten new impetus with this new of legislation.

There is also a problem that the law enforcer sometimes does not know the technicality of the biological species. For example, scientifically a single species is traded in different local names. If one fails to identify the biological species, the question is how to enforce the legal provision. Other legislation that favors species conservation is grossly inadequately enforced in Nepal.

Government, academia and the non-governmental organization are working in isolation. There is an inadequate flow and sharing of information. Research findings are generally technical in nature and they are not adequately utilized in decision-making processes. Academic courses are traditional and obsolete and so are the teaching methods.

Recommendations

Although biodiversity conservation has been a priority concern of the government, NGOs, CBOs and people at large, efforts have yet to be institutionalized to meet the obligations of the Biodiversity Convention. Nepal should still expand policy measures, amend or enact legislation, strengthen institutions, mobilize and develop human resources and implement conservation-friendly activities for the management of endemic, endangered and threatened biodiversity. Species conservation should be emphasized in such a way that it really contributes to maintain the genetic diversity and improve the socio-economic status of the rural people who still depend on these resources for living.

Based on the discussion in the previous sections, the following recommendations have been suggested in the spirit of the Biodiversity Convention in Nepalese context.

Policy and Legal Measures

Both *in situ* and *ex situ* conservation of biodiversity can be enhanced through adopting policies for the continuation and expansion of:

- exploration and identification of biological species, both wild and domesticated;
- declaration of endemic, rare, endangered and threatened flora and fauna at the least at national basis, both wild and domesticated species, based on scientific information and their importance value;
- identification of biodiversity rich areas and implementation of selected programs with stakeholders' participation;
- commercialization and/or conservation farming of highly valued native plant and animal species;
- preparation and implementation of a separate scientific and management action programs for rare, endangered and endemic wild and domesticated biological species;
- institutionalization of a benefit-sharing mechanism, and utilization of funds generated for species conservation;

- mobilization of existing man-power and human resources development, integration of biodiversity conservation aspects in the decision-making process, and launching of public awareness activities;
- promotion for *ex-situ* conservation for highly valued wild species; and
- periodical analysis to measure the implication of the existing policies on species conservation, sustainable use and benefit sharing.
- developing databases and institutionalizing information exchange systems;
- Facilitating the enforcement of Environment Protection Act to deal better with biodiversity conservation;
- developing a system to value biodiversity and indigenous knowledge;
- enacting legislation to deal with agriculture biodiversity; and
- enforcing the environmental assessment of proposals planned for implementation in biodiversity rich areas

Institutional Strengthening and Coordination

HMG's Business Allocation Rules provide institutions with an opportunity to expand activities and strengthen institutions. MFSC and MOA have well-established networks of institutions from centre to local level. These institutions should work in collaboration and the institutions will be strengthened as biodiversity conservation more work expands. In the present context, the institutions could expand the implementation of biodiversity conservation effectively. Similarly, MOPE has the mandate and unique institutional mechanisms such as EPC and a strong environmental legislation to coordinate and oversee environmental concerns; it should utilized.

There is no lack of mechanisms for national coordination on biodiversity conservation. The National Biodiversity Steering Committee, aimed at national coordination with the representation of different stakeholders, can solve the coordination issues, if any. If further coordination is needed, the Environment Protection Council has also been legally established for national coordination for environmental matters, including biodiversity conservation. However, there is a need for establishing functional linkages among

the implementing, research, educational organizations, NGOs and CBOs.

Capacity Building

The government institutions absorb significant human resources. The basic problem, however, is the mobilization of the resources appropriately. It is therefore desirable to:

- make modifications in curriculum to incorporate biodiversity conservation issues in basic applied sciences at different levels;
- advise research organizations to documenting and developing indigenous conservation practices and sharing of information and technologies;
- identify and strengthen institutions in order to conduct a nationwide survey of plant and animal genetic resources and inventorying and cataloguing of ecosystems and genetic diversity by allocating adequate funds;
- advise organizations involved in hybridization who utilize indigenous gene base to ensure the conservation of parent genes;
- domesticate commercially valued species and avoiding degeneration due to biological contamination;
- utilize research findings in policy and program formulation;
- improve and strengthen existing organizations such as MOPE;
- involve local NGOs and the CBOs in implementing conservation prescriptions; and
- redefine roles and responsibilities of the organizations involved in biodiversity conservation.

In conclusion, Nepal must proceed towards the sustainable use of biodiversity and equitable sharing of its resources. Mechanisms are also required to ensure a "back-flow" of income for conservation purposes. It is highly expected that the integration of the above recommendations in policy, planning and implementation will contribute to biodiversity conservation, and thereby to successful implementation of the CBD.

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UN Convention to Combat Desertification
(An Overview of Issues Policy and Legislation)

*M.P. Wagley**

Introduction

Desertification is basically a land degradation process, which outrages the earth for its natural resources. It begins in small patches and progresses to huge areas formina a desert like environment. It is a result of a deterioration of land resources that are used beyond their carrying capacity for sustained production.

Desertification starts from the impact of various environmental stresses on natural resources, which develop from both natural processes as well as human activities. Prolonged draught, heavy rainfall, flooding, erosion, landslides, deforestation, overgrazing, abuse of marginal land, water logging, salinization etc. are some of the factors responsible for the development of desertification. However more basic reasons for land degradation and desertification are due to human activities, with climate being only a supporting factor.

The consequences of desertification are decreased production capacity of the land, increasing poverty and eventually the threat to the socio-economic development of people.

The concerns on desertification issues were intensified at the UN Conference on Environment and Development (UNCED 1992). Its declaration emphasised combating desertification through formulating and executing various plans, policies and programmes, as reflected in Agenda 21.

* Director General, Department of Soil Conservation & Watershed Management, Babar Mahal, Kathmandu, Nepal

Issues

Desertification issues are the major issues of concern of many developing countries of Asia and Pacific region. Poverty has been shown to be one of the root causes for desertification in many of the developing countries in the region, However, in many çases poverty and desertification are inter-related: one is responsible for developing other. Because of poverty, people are often driven to get as much out of the land as possible in a very short period, which, in turn, aggravates the situation. In many countries of the region, the poorest are incredibly marginalized, socially and economically. They live in the geographically most remote and least visible areas with the harshest climatic and environmental conditions, struggling with the challenges of sustaining themselves. The global assessment of human-induced land degradation has indicated that about 849 million ha. of land (24% of the total land area of the region) in Asia and Pacific region are affected by the degradation process. Thirteen percent of arable land in the region is severely degraded, 41 percent is moderately degraded and 46 percent is lightly degraded (WRI/ UNEP/UNDP/WB 1996). The different causes of land degradation in the Asia-Pacific region associated mainly with human activities are illustrated in Table 1.

Table1: Causes of Land Degradation in Asia – Pacific

S.No	Human Activities	Area of land degraded (million ha) in region	Percent share by the activities
1.	Removal of vegetation	310	37%
2.	Overgrazing	280	33%
3.	Agricultural Activities	212	25%
4.	Over-exploitation	46	5%
5.	Industrial activities	1	-

Source: UNEP (1997)

Many of the developing countries in the region have similar causes and consequences of desertification. In Bangladesh, population growth, unplanned logging, deforestation and faulty cropping pattern

have resulted in serious problems of land degradation. About 1,504,000 ha. of agricultural land (15% of total agr. land) are affected by water erosion in Bangladesh (UNEP 1997). In China, high population pressure, physiographic features and frequent natural disasters are primary causes for desertification. More than half of the land resource of India is categorized under wastelands. The extensions of wastelands in India are due to drought, floods, soil erosion and deforestation. As in other asian countries, Pakistan and Sri Lanka are also facing serious problems of land degradation. Poverty, indiscriminate use of natural resources, erosion, and floods, shifting cultivation, encroachment and deforestation are the major causes for desertification in these countries. In Pakistan, it is estimated that about 24.6 million ha of land is affected by water and wind erosion, salinity, water logging or flooding.

The percentage of areas of agricultural land affected by water erosion in certain countries in South Asia are given in Table 2:

Table 2: Areas Affected by Water Erosion in South Asia.

Country	Total areas affected (thousand ha.)	Total as % of Agr. land
Bangladesh	1,504	15
Bhutan	40	10
India	32,773	18
Nepal	1,592	34
Pakistan	7,204	28
Sri Lanka	1074	46

Source: UNEP (1997)

The deforestation rates in South Asia countries are increasing alarmingly. In South Asia, the annual rate of reduction of forest area is about 141,000 ha/year (0.2%). Information on change in forest area from 1990-1995 in some South Asian Countries is illustrated in Table 3:

Table3: Change in Forest Cover (1990 - 95)

Country	Total forest area (thousand ha.)		Total change (thousand ha.)	Annual change (thousand ha.)	Annual Change (%)
	1990	1995	1990-1995		
Bangladesh	1,054	1,010	-44	-9	-0.8
Bhutan	2,803	2,756	-47	-9	-.0.3
India	64,969	65,005	36	7	-
Maldives	N.A	N.A	N.A.	N.A.	N.A
Nepal	5,096	4,822	-274	-55	s-1.1
Pakistan	2,023	1,748	-275	-55	-2.9
Sri Lanka	1,897	1,796	-101	-20	-1.1
South Asia	77,842	77,137	-705	-141	-0.2

Source: State of the World's Forests, (1997)

In Nepal, desertification problems are mainly associated with deforestation, overgrazing, over cultivation and encroachment of forest and marginal land for cultivation and resettlement. Forests of Nepal are declining both in quality and quantity due to the increasing pressure of human population. The extent to which deforestation has contributed to desertification in Nepal is not available. However, the conversion of productive forest into non-productive shrub lands, wasteland and xerophytic types, the expansion of bare soil surface, erosion, landslides, loss of soil nutrient and the poor condition of soil are some of the evidences that lead us to establish the linkages between deforestation and desertification.

Deforestation in the extremely fragile Siwaliks and Hill slopes has resulted in degeneration of watersheds with the loss of surface cover which upsets the hydrological cycles causing the drying-up of perennial flows, increasing flash floods and sedimentation, loss of water supply and farm production.

Natural meadows, pastures and other grazing land are overused when there is livestock overstocking. This occurs when the herds of cattle, buffalo, sheep and goats exceed the carrying capacity of grazing land. Overgrazing creates the desert-like environment through the expansion of bare soil surface. It has also invited the growth of less productive and low nutritive annual grasses.

There has been a continuous migration of the population from the hills and mountains to Terai. The forest areas have been encroached in the search for more cultivable land and for resettlement purposes. The population density for different ecological regions gives us an idea about the population pressure on the land (Tables 4 and 5):

Table 4 . Population Density in Different Ecological Zones

Year	Population Density (Person/Km^2)		
	Mountain	Hill	Terai
1971	22.0	99.0	128.0
1981	25.0	117.0	193.0
1991	27.9	137.3	253.6

Source: HMG, 1994

Cropland also suffers from the desertification problem. Human activities and a high number of livestock accelerate the problem. Inappropriate land use practices and extension of cropping on marginal and unsuitable terrain have declined soil fertility. Soil erosion and landslides in croplands are also increasing. Soil and nutrient loss are responsible for land productivity decline. Damage to cropland due to erosion and landslides are common in every monsoon. The area of land affected by erosion, floods and landslides is illustrated in Table 6:

Table 5. Change in Forest Area in the Plains by District

Districts	**Fiscal years**		**Change (ha)**	**% Change**
	1978/79	1990/91		
Kanchanpur	51000	38600	-12400	-24
Kailali	109900	93800	-16100	-15
Bardiya	44100	38800	-5400	-12
Banke	72800	63100	-9700	-13
Dang	38000	36400	-1600	-4
Kapilbastu	54300	46600	-7700	-14
Rupandehi	25600	16000	-9600	-37
Nawalparasi	33900	25600	-8400	-25
Chitwan	20900	18500	-2400	-12
Parsa	25700	23200	-2600	-10

Bara	38200	35400	-2800	-7
Rautahat	25400	24100	-1300	-5
Sarlahi	15900	13800	-2100	-14
Mahottari	12800	9400	-3400	-26
Dhanusa	2000	2600	+600	31
Siraha	4100	4300	+200	5
Saptari	5100	3300	-1700	-34
Sunsari	14800	11100	-3700	-25
Morang	31900	26700	-5200	-16
Jhapa	19100	15000	-4100	-22
Total	**645300**	**545900**	**-99400**	**-15**

Source: Forestry Survey Division, 1993

Table 6. Land Affected by Erosion, Landslide and Floods

Year	Land affected (Ha)
1984	1242
1985	1355
1986	1315
1987	18858
1990	1132
1991	283
1992	135
1993	5584
1994	392
1995	41867

Source: HMG, 1996

The precise measure of the extent of desertification in Nepal is not available, However, some consequences of desertification are clearly visible. Many of the watersheds are in a state of desertification due to physical and biological deterioration of their resources. Almost all types of land degradation exist in Nepal. Erosion, flooding, and water logging are identified as three major types of land degradation in Nepal. An old inventory of watershed conditions in Nepal estimates that roughly 7 percent of the total land area (10,000 Km^2) is in the process of desertification. Some experts have predicted that about 20-100 tons of soil each year is removed from badly managed land.

Policy Framework

Soil erosion, landslides and flooding are the major contributing factors for the desertification process in Nepal. Almost all ecological zones are affected by desertification problems. Land productivity has been reduced in all zones.

Awareness of the concerns and the problems of desertification have existed in Nepal for more than two decades. The plan for combating desertification problems was first included in the Fifth Plan (1975-80). Priority has been given by the government to reduce the degradation process in the country since that time until now. The Eighth Plan (1992-97) had also identified the need to cambat desertification issues such as deforestation, soil erosion, loss of bio-diversity, loss of soil fertility, and inappropriate uses of chemical fertiliser, and irrigated water. Based on these issues, the Eighth plan considered environmental issues holistically with special consideration of the linkages between natural resource and development.

The Ninth Plan (1997-2002) has also given due consideration for controlling the desertification problem in Nepal. Policies related to combating land resources degradation in the Ninth Plan include (HMG, 1998):

- The growing practice of farming on unsuitable and marginal land will be discouraged to control the increasing rate of soil erosion in the hilly areas.
- Various conservation and management practices will be created and executed to permit settlement or farming on the basis of the carrying capacity on the land.
- To maintain ground water renewability of the Terai region, priority will be given to the land and watershed conservation programme with people's participation.
- Every agency will be encouraged to select programmes and projects after having sectoral environment impact assessments.

- Assign responsibilities to institutions to implement the Environment Act successfully for environment conservation issues.
- Environment education will be extended to university level from primary level.
- Conducive atmosphere will be created for encouraging NGO's and private sector to engage in environmental activities.
- Institutional and procedural arrangements will be made for adequate management and protection of lakes, swamp, marshlands etc.
- Environmental activities in conjunction with development programmes will be undertaken with the initiative and participation of local women and youth.
- Protection of Siwalik range with a view to conserve soil and to renew water will be given priority and programmes will be launched to protect it.

To enforce the national policy, Department of Soil Conservation and Watershed Management (DSCWM) has set the following implementing strategies (HMG, 1994) :

* Ensure operations of central level and district level soil conservation and watershed management (SCWM) programs in line with the integrated watershed management approach on the basis of watershed conditions and priority watershed areas.

* Ensure linkage and networking among the green sectors (forestry, agriculture, livestock, water resources) and sustainable peoples participation by developing appropriate technology, conservation extension and education, and demonstration.

* Disseminate technically feasible, economically viable and environmentally sound SCWM activities to the local level.

* Conserve, develop and manage land and water resources with watershed areas as a planning and management unit.

* Incorporate income-generating activities in SCWM programs.

* Co-ordinate management services among green sectors (forests, agriculture, livestock, and water resources) at local level.

* Minimize the possible negative environmental consequences caused by the development activities.

* Develop a co-ordination mechanism among land and water management agencies and identify pollution indicators by analyzing environmental phenomena.

Legal Provisions

Virtually, it is difficult to implement any development policy decisions and strategies without appropriate legal instruments. Legal instruments provide legal and authoritative arrangements for enforcing policy. In fact, legal instruments help :

* insuring implementation policy.
* ensuring institutional arrangements at central as well as at grassroots levels.
* enforcing guidelines.
* prohibiting, regulating and restricting the abuses of resources.
* strengthening responsibilities for collaboration, co-ordination and integration among agencies
* encouraging beneficial actions to be taken and discouraging others.
* providing legal status to community-based organizations, or users etc.

In Nepal, various natural resources-related sectoral action plans, policies, Acts and legislation have been promulgated. The Environment Protection Act (1996), Environment Regulations (1997), EIA guidelines (1992), Forest Act (1993), Forest Legislation (1995), Water Resource Act (1992), Water Resource Regulation (1993), Soil and Watershed Conservation Act (1982) and Soil and

Watershed Conservation Legislation (1985) etc are some of the key legal instruments related to natural resources . These are promulgated with a view to establish a policy framework and to plan and to execute the policy in order to meet objectives and goals. However, none of the above Acts and legislation are directly related with the land degradation and desertification problem. They do not have particular functions to specify the needs for combating desertification. They all are scattered in different sectors of government institutions and there are no coherent linkages to each other in terms of controlling desertification process.

At present, only the Soil and Watershed Conservation Act (1982) and Soil and the Watershed Conservation Legislation (1985) are solely related to land degradation and desertification issues in Nepal. Provisions for combating land degradation issues include declaring protected watershed area, classifying the land according to land-use, enforcing the land use system, transferring land ownership to government, providing technical services and financial support to local people, protecting land within a watershed from degradation, prohibiting development work within the watershed where degradation may occur, mobilizing and institutionalizing grassroots and community-based organizations etc. These are the key provisions related with desertification control issues.

Institutional Arrangement /Linkages

A few countries in the Asia and Pacific region have separate national institutions charged with the particular responsibility for combating desertification. However, many efforts have been made to meet the challenges of desertification by establishing linkages and networking among national and regional government or semi-government and non-governmental organizations. In Nepal, various national and governmental institutions are working to deal with the environmental issues. The following institutions, directly and indirectly deal with the environment of natural resources at the national level:

The Environmental Protection Council (EPC) is the main body at the policy level. Its responsibilities include: formulation of national

policy & plans, co-ordination with other agencies, monitoring the issues and issuing directives.

The Ministry of Population and Environment (HOPE) is the body responsible for monitoring plans, programmes, preparing guidelines, conducting research & studies and contacting and co-ordinating all aspects of Environment. The Ministry of Forest and Soil Conservation is the apex body responsible for implementing the plans and programme related to forestry and land degradation or desertification. The Ministry of Water Resources has partially played the supportive role in combating resource degradation issues.

King Mahendra Trust for Nature Conservation is also playing significant role in conserving the forest. At the political level, there is a parliamentary committee on Natural Resource and Environment that reviews the actions of government initiated environmental conservation programmes.

In fact, the Department of Soil Conservation and Watershed Management of the Ministry of Forest and Soil Conservation is the only leading government institution which is mandated for combating desertification or land degradation problems in Nepal . Various land rehabilitation and soil conservation programmes have been carried out by this organization. This Department, since its establishment in 1974, has been mandated for planning, implementing and monitoring the land protection and conservation activities with the principle and framework of integrated watershed management in the country. This department has been able to focus on mitigation programmes for land degradation in 55 districts with the development of district level implementation institutions. Other national institutions related with natural resources have also contributed to conserving and protecting, flora and fauna, biodiversity, water-resources etc. Aside from the Department of Forest, Department of Water Resources and Department of Agriculture, other national institutions related with environment conservation have maintained very narrow linkages with the Department of Soil Conservation and Watershed Management.

Issues and Constraints

Policy Level

The present policy for meeting the challenge of desertification and land-degradation problems is not adequate. In the absence of a clear cut and a long-term policy at national and district levels, the problems of land degradation cannot easily be solved.

Often the sectoral and implementation policy of some institutions are overlapped. Repetition overlapping of policies is creating confusion among the institutions.

Implementation of the policy has been very poor in Nepal because of lack of commitment and political will. Resources, especially the financial resources, are inadequate to run the programmes timely and effectively.

- Lack of enforcement of policy exists because of lack of compatible legislation for combating desertification.
- Lack of appropriate knowledge and information about degradation has also made the policy enforcement difficult.
- Lack of inter-sectoral co-ordination, integration and interests has resulted in slow progress in obtaining the policy objectives.
- Lack of integrated planning to combat desertification problems.
- Lack of policy for the sustainable use of local resources and mitigation measures.
- Lack of specific desertification mitigation management plan for desertification prone zones.
- Lack of mechanism to continuously monitor the conditions of the desertification process.

Legal and administration matters

There is a lack of a sound legal instrument particularly for the enforcement of policy and activities. The Soil and Watershed Conservation Legislation (1985) is the only instrument that deal with land conservation and management in Nepal. Unfortunately, this law has not been put into practice except in Shivapuri Watershed. Various weaknesses and problems identified in the legislation are :

- Provision for the declaration of protected watershed is not viable, realistic or a practical approach.
- Acquisition of private property within the protected watershed is not the appropriate provision.
- Politicians have no support to implement the law.
- Government has a lack of resources to compensate for taking privately owned land and property.
- Legislation is not people centred (especially in regards to the resource poor farmers).

Budget allocation and staff resources are often inadequate to implement the programmes efficiently in the district.

Institutional arrangement

Institutional issues are the most difficult issues facing the policy makers. Some of the issues that are not addressed while making efforts for combating desertification problems are:

- How should the programmes be organised & where
- What relationships should be maintained with local agencies
- What responsibilities of the different parts of policy should be given to the local agencies
- How the duplication of sectoral policy and programmes can be avoided
- How to maintain continuous and close linkages with the concerned agencies (GO/NGO)

- How to share information and develop network among stakeholders
- How to avoid conflicting approaches and to integrate and co-ordinate the programmes with other agencies
- How to strengthen the capacity of local and central institution
- How to develop and update the database of degradation information

Recommendations/Suggestions

Problems of watershed degradation and desertification are linked with socio-economic, biophysical and natural factors. Current approaches and efforts to combat the integrated problems will not be sufficient to come to a satisfactory result. Involvement of all sectors directly or indirectly is imperative. Activities related to combating watershed degradation should be considered and prioritised as a national program. There should be national movement, commitment and participation from all (politicians, planners, technicians, villages, communities, and grassroots levels) in all sectors to resolve the problem of desertification. Based on these facts, the following recommendations are proposed:

- A National inventory should be conducted and database created on the state of watershed degradation and the degree of desertification should be developed.

- Based on the inventory, hot spots should be identified, and preventive and rehabilitative programs to combat desertification should be developed;

- Desertification programs should be integrated into the national development plan.

- Policy to provide continuation in assessment, monitoring and mapping of land degradation and desertification should be developed;

- Policy to mobilize active community participation in desertification control programs should be developed;

- Policy to strengthen the capacity of local institutions and village communities in decision-making, program planning, implementation and monitoring should be developed;

- Strengthening the capacity of national cadres to assess, plan, implement and monitor the desertification control program is also imperative;

- Local resources and indigenous technology should be identified and mobilized to make the desertification combating programs sustainable;

- The Department of Soil Conservation should act as a focal point for program co-ordination. It should also develop national, regional and international networks on watershed degradation and desertification condition of the country;

- Long-term integrated programs should be designed for desertification control in such a way that they generate income for the local people and increase land productivity;

- Policy to ensure co-ordination and integration mechanisms at local national levels should be developed;

- Capacity of national research centre on watershed degradation and desertification process should be strengthened;

- Policy to exchange technology transfer at national, regional and international level should be developed; and

- Existing Soil and Watershed Conservation Act (1982) and its Legislation should be amended.

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Management of Persistent Organic Pollutants (POPs)

Puspa Raj Shrestha
Nepal Bureau of Standards and Metrology

Introduction

For the last few decades, we have seen tremendous growth in chemicals manufacturing, use and other activities that result in the release of toxic substances, which pose serious threat to human health and the environment. The challenge is to reduce and manage the risks in an environmentally sound and cost-effective way. Particularly challenging is a group of chemicals known as Persistent Organic Pollutants (POPs).

Persistent organic pollutants (POPs) are hazardous chemicals that resist photolytic, biological and chemical degradation. They are often halogenated and characterized by moderate to low volatility, low water solubility and high lipid solubility leading to their accumulation in living tissues. Their persistence in various media enables them to move long distances to regions where they have never been used. These highly stable chemicals are used as pesticides or in industry. As result they may be found everywhere

Halogenated hydrocarbons are a major group of POPs, and of these, organochlorines are by far the most important group. The UNEP Governing Council Decision 19/13 adopted by governments in Feb 1997 identified twelve POPs (DDT, Aldrin, Dieldrin, Chlordane, Endrin, Heptachlor, hexachlorobenze, mirex, PCB, Dioxins and Furans) for which international actions had been initiated to protect human health and the environment.

Selected organochlorine chemicals have carcinogenic effects and act as strong tumor promoters. WHO had classified aldrin, dieldrin, and endrin as highly hazardous and the International Agency for Research on Cancer has classified remaining eight POPs as

possibly carcinogenic to humans on the basis of their toxicity on experimental animals.

Laboratory investigation and environmental impact studies in the wild have implicated that many POPs have devastating effects on environment and human health. POPs damage the immune system of life forms making them vulnerable to sickness, ailments and eventual death. Some POPs are also known for disrupting endocrine systems and affecting fertility in humans and wildlife. It had been reported that in Costa Rica, hundreds of young people who have been exposed to these organochlorine pesticides for long have become sterilized and robbed them of becoming parents and having the joys of their own family (Zumbado 1998). Hence POPs are considered dangerous chemicals capable of threatening entire population of the world.

Humans are exposed to POPs through diet, occupational accident and the environment (including indoors). The human exposure to POPs is mainly attributed to food chain. Contamination of food occurs through environmental pollution of air, water, and soil, or through previous or unauthorized use of organochlorine pesticides on crops. A number of incidents of acute toxic effects in humans including death have occurred as a result of contaminated food. Edible oils and foods of animal origin are most often involved (Stober 1998).

Persistent Organic Pollutants (POPs) in South Asia. An overview of Environmental issues widespread contamination of POPs in Asia and particularly in the South Asia sub-region is a very serious challenge faced not only by the region but also by the world community as a whole. This situation has been created as a result of irresponsible corporate behaviour, ignorant and indifferent governments and shortsightedness of the lending and donor agencies.

Abundance of stockpiles of obsolete pesticides including POPs in Pakistan (800 MT POP), Nepal (35 MT POP) and Bangladesh (300 MT POP) have been reported (Tahir 1999, Palikhe 1999 and Harmandez and Jayraman 1998). There are no confirmed reports of

the stockpiles of POPs in India although it is among four known manufacturers of DDT in the world and exports nearly 800 MT of POP pesticides including BHC, Chlordane, aldrin and HCH to a number of countries where their usage is banned. The use of pesticides in Sri Lanka, Maldives and Bhutan is reported to be relatively small.

The continued production and formulation of POP pesticides in India is the most important POP related problem for the country and region as a whole. It is believed that barring a few pesticides that do not have market, old pesticide stocks in India would have been released into the market in the form of substandard formulation particularly into Nepal and Bangladesh. Smuggling of POPs has been widely reported in this sub-region, for example Pakistan receives its DDT from China and Iran; Nepal and Bangladesh from India. BHC and Aldrin are smuggled to Nepal and Bangladesh through the porous open border.

The conditions of stockpiles of obsolete organochlorine pesticides in these countries are very serious and need urgent national and international attention. Reports allege that spillage of pesticides from the storage places have led to cattle and deer fatalities in Nepal. In Pakistan, significant quantities of these stockpiled pesticides have disappeared either due to pilferage or loss to the environment. It is estimated that nearly 65000 litres and 70 tons of various pesticides have been lost through leakage and container deterioration in one of the stockpiles in Pakistan.

The securities of these stockpiles are also very much vulnerable to unscrupulous people. There are reports that stolen DDT from Chitgong Chemical Complex came to the open market during the 1994 plague outbreak in India. The stockpiles in these three countries have been cited as time bomb that can only lead to a big catastrophe if not corrected.

Hardly any serious debates about whether these obsolete pesticides stockpiles have damaged the environment and human health were heard of in Nepal and Pakistan. Surprisingly it is also not debated

who should be made responsible for their disposal. It has been already decided that the local people bear the cost for the crime they have not committed. It is sad that neither the multinational chemical companies which supplied the neither poison nor donors/ aid agencies have come forward with any assistance. The government of Nepal and Pakistan are taking loans from international financial institutions/banks to dispose the stockpiles.

Besides organochlorine pesticides, Dioxins, Furans and PCB (industrial chemical) are other POPs that are identified for action under the UNEP process. These POPs are hardly considered issues in the region. The region is still preoccupied with DDT and other POP pesticides, whereas such chemicals producing technologies are rapidly expanding in the region.

The major primary source of dioxins include inefficient combustion processes used in incineration of municipal and medical wastes, industrial processes such as chlorine bleaching in the paper and pulp industries, chlorination in the manufacture of chlorinated pesticides and PVC. Incinerators and PVC manufacturing units are expanding rapidly in South Asia. The environmentalists refer PVC factories as dioxin factories since PVC poses the threat of producing dioxins and furans at every stage of its life cycle. Dioxins were classified as known carcinogens by WHO in 1997 and are considered twenty thousand times more lethal than DDT.

Most of the small and medium scale industries in the region employ outdated technology and equipment resulting in greater pollution. The widespread use of bleaching processes and the lack of adequate waste treatment facilities, coupled with very weak monitoring mechanisms, are attributed as main source of POP pollution in the region.

DDT and other chlorinated pesticides are being used in this region for controlling plant pests and vector borne diseases like malaria and kaalajar since the late 1940s in India and the 1950s in the rest of the sub-regional countries. The green revolution in India and the introduction of high yielding rice varieties and agricultural intensi-

fication programs in other countries of the region in late 60s and early 70s have significantly increased the use of such pesticides. At present the region is considered as one of the greatest consumer of pesticides in the world.

At the time when these dangerous chemicals were used, the general awareness on environmental issues was very minimal and people were not told about their negative effects on human health and the environment. People just saw the miraculous effect on malaria and pest control. People, especially illiterate farmers, started to call pesticides medicine. The governments also encouraged the use of such pesticides.

Intensive promotion of DDT as the pesticide of choice for controlling mosquito and other vector borne diseases, led to large donations of this chemical to the South Asian countries. Nepal, in particular, received DDT for its malaria eradication programs from the early 1950s from USAID. The USAID program was stopped in the 1980s; nearly a decade after the chemical was banned in the USA. Unfortunately both DDT and BHC continued to be sent to Nepal in increasing quantities through the 1980s. As recently as 1997, DDT has been imported in Nepal.

Greenpeace has reported in 1998 that hundreds of miniature Bhopal accidents are happening in slow motion across South Asia. Sporadic cases of fatal pesticide poisoning have been reported in most of the national dailies of the region. Exceptionally high levels of B-HCH (4.37-8.87 ppm) in breast milk were evident in some parts of India. Infants taking breast milk in these areas exceed the Allowable Daily Intake (ADI) by 11-20 times. In recent years, scientific evidence has shown that elevated concentrations of DDE, a breakdown product of DDT are associated with reduced lactation by human mothers.

Some of these POPs have been in use for more than forty years in almost all the countries of South Asia. Because of their persistent nature, there is a great risk of food contamination by these compounds. A survey carried out by FAO during 1981-84 indicated

that organochlorine pesticide was found in 48 food composites in Pakistan (Tahir 1999). A report published by the Central Food Research laboratory in Nepal has shown that cereals, vegetable, meats, milk, fish and oil seeds, contain DDT residues higher than the acceptable level prescribed by WHO (Joshi 1988).

DDT/BHC are used on dried fish to increase its shelf life in Bangladesh. A study carried out by Institute of Food Radiation Biology of Bangladesh reported 50-100 ppm of DDT in many of the locally marketed dry fish (Sarkar 1998). Similarly in Nepal, aldrine, metacid, and demeton-methyl are used as fishing bait in some western districts (Kandel and Mainali 1993). In Bangladesh, PCBs are reportedly used a balm as medicine for curing joint pains and to impart colour to mustard oil which is used for cooking. These dangerous practices are becoming serious public health hazards.

The agricultural run-off of pesticides has proved a potential source of surface and groundwater contamination. Ali and Jabbar (1991) reported that shallow ground water in cotton belts of Pakistan, where organochlorine pesticides have been extensively used for increased cotton production, are found to be contaminated with Endrin (2 ppb), BHC (1-13 ppb) and Aldrin and dieldrin (2- 31 ppb). There are reports of soil contamination in cotton growing areas of Pakistan and India where DDT have been detected in the lower 2-3 feet layers of the soil.

Scientific studies on POP pollution have not been carried out in most of the countries of the region due to the lack of infrastructure facilities. Much information on the presence of POPs in the environment in Asia and particularly in this region is not available. However, if deduced logically, it could be said with certainty that South Asia is putting their people and environment at risk with producing, using and keeping obsolete POP pesticides.

Scale of POP problem in Nepal

Nepal has received nearly 400 MT of highly toxic pesticides including POP from the US and other developed and developing

countries in the form of aid and trade during the last four decades. For various reasons, large quantities of these pesticides were not used in a timely manner and have since accumulated in government warehouses scattered throughout the country.

Nepal's most visible problem is these stockpiles. The amount of obsolete organo-chlorine pesticide stored is 35 MT, most of which are banned and no longer exist in the market. The amount of POP listed pesticides is nearly 8 MT. The stock of POPs is not large compared to other Asian countries. However safe disposal of these stockpiles is a complex regulatory and environmental issue. Though there are environmentally sound techniques available, they are quite expensive and needs technological capabilities for which Nepal does not possess. Nepal requires financial and technological resources.

Storage and disposal of date-expired pesticides are most acute in the Agricultural Input Corporation (AIC), the only semi-government corporation authorized for supply of pesticides in the country and government farm due to lack of official disposal procedures. The case is not so obvious in case of private dealers. This may be attributed to the absence of restraints on the private sector.

In 1990 the stock of the date-expired pesticides was estimated to be 146 MT. By 1992 nearly 74 MT of expired pesticides were buried or spread over ground, 16 MT were reused and 23 MT were reformulated with the technical assistance of ANZDEC Ltd. ANZDEC Ltd. was the consulting company hired by ADB and UNDP for disposing of the obsolete pesticides. ANZDEC LTD sought to burn 19 MT pesticides in a Heated Cement Factory, which was vehemently opposed by local people and environmentalists. The incineration process was deemed unfeasible because Nepal lacked proper incineration equipment and mechanism for monitoring gas emission.

Review of the disposal of these pesticides carried out by ADB indicated that Amlekhgunj burial site was a public health hazard.

Management and control of POPs

Existing Policy and Regulatory Practices.

In South Asia, extensive use of POPs in the last four decades in agriculture and health sector and to lesser extent in industry, have resulted in numerous pesticide poisonings, pesticide residue in foods and development of a pest resistance to pesticides. These serious concerns of environment and human health issues associated with the use of POP pesticides prompted the countries to shift to an alternative pest control method. In the mid and late 80s all countries of the region except Maldives and Bhutan adopted an Integrated Pest Management (IPM) as their plant protection policy. The plant protection infrastructure needed to implement IPM in place in most of the countries.

In adopting IPM policy, the long-range goal of many countries included the reduction of actual usage of pesticides. Thus this policy has become the complementary approach for controlling POP pesticides to a greater extent. At present most of the countries are implementing IPM in rice growing areas and slowly expanding to vegetable production.

The United Nation Convention on Environment Agenda 21 also emphasizes IPM as the best tool for 21st century plant protection services. Realizing this potential, His Majesty's Government of Nepal is creating public awareness and implementing IPM through IPM Farmer Field School for proper management of pesticides and hazardous chemicals. Since 1990, most of the work on pesticides has been on the policy making front for promoting better pesticide use. This is reflected in the Eighth Five Year Plan (1992-1997) and Long Term Agricultural Perspective Plan (APP), 1995-2015.

Most of the end users of pesticides are farmers who are poor, illiterate and ignorant of the ill effects of pesticides. IPM enables them to understand local agro-ecosystem and devise techniques accordingly. They become IPM experts. Application of IPM is hardly likely to be successful unless policies of phasing out of oganochlorine

pesticides is also implemented, by substituting POPS with other environmental friendly alternatives.

For sound management of hazardous chemicals His Majesty's Government/ Ministry of Industry developed an Industrial Hazardous Waste Management Policy in 1994 under UNDP assistance. The hazardous waste has been classified into three different categories according to the toxicity and health hazard. It also specifies the preferred management of the waste. However, the government has not yet implemented the policy. This policy is based on both polluter pays principle and market based instruments.

Increased awareness of the hazards posed by the use of these chemicals resulted in initiatives to control their use through regulation and a registration system. To promote environmentally sound management of pesticide, Nepal promulgated The Pesticide Act 1991 and Pesticide Rule 1993, under which it is made mandatory that any pesticide before distribution and importation should be registered at the pesticide registrar's office through official procedures prescribed by the Pesticide Board, and get permission prior to its production, distribution storage and sale. The permission will be awarded to an applicant whose pesticide meets registration requirements. The registration requires the submission of technical and administrative data such as phyco-chemical and toxicological properties, efficacy and residues.

The Pesticide Act 1991 provided for the establishment of a Pesticide Registration office at Department of Agriculture and a Pesticide Board under the chairmanship of the Secretary to the Ministry of Agriculture. The chief executives of concerned government organizations and department heads of Entomology and Plant Pathology departments of the Nepal Agricultural Research Council and representatives of pesticide associations represent the Board.

The Act outlines the functions and duties of the Board which include the formulation of a national policy for pesticides, encouraging private sector in the pesticide trade, coordination

between private and government agencies in the production and distribution of pesticides, and establishment of quality control standards. The Board may, as it deems necessary, constitute sub-committees for the smooth operation of activities relating to pesticide management. Accordingly the Board has constituted two sub-committees: the Technical sub-committee and legal sub-committee.

In implementing the registration processes, the pesticide registrar prepares a list of chemical pesticides to be submitted to the pesticide board for review, and only those pesticides will be allowed to be legally imported, produced, distributed and used in the country. The Board has the power to cancel the registration of gazette chemicals or to suspend them for any specific time by notification in the Nepal Gazette. For effective implementation of the legislation, the pesticide board can issue directives/guidelines, which every stakeholder needs to comply with. So far two guidelines on registration process and safety measures have been issued.

Under the Pesticide Act and rules, the registration at present restricts the trade of highly hazardous pesticides (WHO class IA and IB). Pesticides belonging to class IA and twelve POPs are banned. All pesticides on the prior informed consent (PIC) list except methy-parathoin, monocrotphos and phosphomidon have not been registered.

There is also provision in the Act for appointments of pesticide inspectors to monitor and set penalties for breach of the law. They are made responsible for training, educating trainers and users in pesticide safety. Plant protection officers in the District agriculture development office have been designated as pesticide inspectors for the district. Because of the limited resources, the enforcement of the act and rules seems to be weak.

Private sector participation has been given due importance for effective implementation of the Pesticide Act and rules. The Pesticide Board consists of one representative from the duly recognized Pesticide Association.

The Environmental Protection Act 1996 and Environmental Protection Regulation 1997 made it mandatory to conduct either an Initial Environment Examination or Environmental Impact Study for any type of manufacturing chemicals according to the production capacity and hazardous nature of the chemicals. An IEE is compulsory for import of 1-10 tons of registered pesticide and sale or disposal of 100 kg or more pesticide. An EIA is required to import more than 10 tons of pesticides and to establish any registered pesticide industry. An EIA is also required for disposing more than one ton of pesticide. However the Environmental Protection Acts and regulation do not address the pollution control measures for POP chemicals.

The Pesticide Act and Regulation have the following basic concepts:

- Submission of application to register for pesticide use with required data and other information and draft of a label;
- Formation of Technical Advisory Committee to assist in the evaluation of scientific data submitted for registration;
- Appointment of inspectors to monitor and enforce law;
- Control of imports and restriction on availability.

An application is submitted with relevant data and is reviewed by the Technical committee and then regulatory action is recommended. The data requirement for submission is the usual data on chemistry, efficacy, toxicology and residues. The pesticide registrar office, if it deems necessary, may refer the pesticide to the National Agricultural Council for conducting trials for its efficacy test. At present, decisions made in other country form the basis for regulatory decisions. The environmental impact of pesticide use is rarely carried out, because of lack of expertise.

The labeling requirements of registration system are almost harmonized based on the FAO guidelines.

For controlling the unfair pesticide trade, the pesticide regulation made it compulsory for importers to furnish the particulars of the

pesticides imported within a fiscal year, describing the quantity and price thereof in a prescribed format to the registrar's office. In case the importers fail to furnish the data, their permission will be revoked.

For regulating the judicious use of pesticides, the retailers and pesticide spraying companies have to get licenses from the registrar office. The terms and condition laid down by the registrar must be followed properly. One of the important conditions to get a license for retailers and sprayers is that they must have some form of training on safe handling and storage of pesticides. The registrar office in various districts conducts these training regularly.

There are no separate rules and regulations stating food safety and residue analysis. The pesticide board may refer it to the Central Food Research laboratory or the Nepal Bureau of Standards and metrology. Similarly there is no section to control residual limit or tolerance levels of such items.

Regarding control of waste disposal and empty containers there is no separate rule or regulations. The Pesticide Act and Regulation have not set any rules for disposal of the obsolete pesticides.

Institutional Support Services

His majesty's government Of Nepal has designated Nepal Agricultural Research Council as the competent authority to undertake research activity in the entire agricultural sector. Its farmhouses and entomology and plant pathology laboratories are supposed to provide field and laboratory services for IPM activities.

Institutional facilities for monitoring the quality of pesticides and their residues are completely lacking in the country. It is surprising that the quality standards related to pesticides and their test methods have not been formulated. It seems that the responsibility of formulating standards have not been entrusted to any authority by the act. The institutional support for testing pesticides has not

been delineated in acts and regulation. At present there is not a single competent pesticide-analyzing laboratory in Nepal.

The Nepal Bureau of standards and Metrology, a national Standardisation body, has been designated by the government as a national focal point for the International Forum on Chemical Safety (IFCS) and UNEP ODS phase-out activities. The Bureau is providing information on hazardous chemicals and safety practices to the industry, trade and consumers. It is also developing some safety codes and industrial pollution standards. The Bureau is preparing a POP profile of the country with the assistance of UNEP.

Constraints

The following are the major constrains for proper management of pesticides including POPs.

a) Lack of data on nature, composition, quality and quantity of pesticides including POPs in the country. The policy shift from government control to the decontrolling of the pesticide trade to private sectors has made it difficult to keep statistics on pesticide consumption, type, quality and quantity. Furthermore the problem has been coupled with a weak monitoring mechanism and lack of testing facilities. A recent survey carried out by the Nepal Bureau of Standards and metrology for preparing a POP country profile, revealed that banned, date-expired pesticides have been found in the market. BHC and DDT are freely available in the market. This indicates that the enforcement of the Pesticide Act is weak.

b) Lack of Institutional support for implementing the Pesticide Legislation. Very little effort has been done for the establishment of an environmental monitoring program for POPs, including the development of assessment criteria and the adoption of internationally accepted quality assurance procedures. Institutional support for providing information to industry, trade and users on safe handling and judicious use of POPs and on substitutes and ways and means to reduce pollution by POPs, including best environment friendly

practices, have not been carried out. There have been reports of retailers selling the wrong products to the farmers, as well as advising them to use more than necessary. At present there are no legal requirements for pesticide retailers to have any knowledge about correct pesticide use and safety procedures. POPs like DDT and BHC have been found adjacent to

c) Appropriate regulatory measures and the establishment of facilities for environmentally sound collection and the disposal of hazardous wastes have not been developed. The present Pesticide Act and Regulations do not address the issue of chemical pesticide disposal. The problem of safe disposal of stockpiles of existing obsolete pesticides clearly indicates the absence of regulatory measure for collection and disposal.

d) Lack of regulatory measure for pesticide formulation companies to use environmental sound technology (clean technology) and good manufacturing processes avoiding pesticide residue on foods for the farmers. The existing formulation factories in Nepal have been cited as seriously hazardous not only to the workers but also to the farmers who purchase their products. The working environment, storage, and packaging do not comply with the acceptable standards/ regulation. Every report on the plant status has recommended closure. However, without a proper regulatory mechanism it is difficult to do so. Similarly there is no regulation concerning safe residue levels, and pesticide residue regulation needs strong laboratory backup services.

e) Lack of skilled manpower for effective implementation of the Act and Regulation. It is revealed that the most of the plant protection officers who are designated as pesticide inspectors are not familiar with the Pesticide Acts and Regulation. They are not trained in either practical alternatives to chemical control or field based techniques necessary to carry out IPM effectively. In one recent survey, it was found that JTA /and agricultural officers are still recommending DDT and BHC to the farmers.

f) Lack of awareness among farmers (the user group) about the negative effects of pesticides including POPs on the environment and human health. The majority of the user group is comprised of illiterate and ignorant poor people. Failure on the part of society at large to create awareness regarding safe handling, storage and proper dosing and providing safe alternatives is one of the major impediments for managing and controlling POPs.

g) Lack of cross-functional coordination among various government stakeholders. It is observed that there is serious communication problem between research organizations and regulatory bodies.

h) The important issue that hinders most in the implementation of rules and regulation for controlling POPs is the adoption of inappropriate policy instruments-particularly economic instruments. Pesticide is relatively underpriced and they're cost to society in terms of yield losses and environmental damages are not counted. The low price encourages the overuse of pesticides and apathy towards non-chemical alternatives.

Most of the pesticides including banned ones are imported or smuggled from India, where heavy subsidies are given to the producers.

Suggestions and Recommendation

1. Development of compilation and maintenance mechanism of inventories of the source, release and identification of sinks of POPs for pollution control measures.

2. Development of hazardous waste management policy and regulation that delineate comprehensive national programs of action for reduction and/or elimination of hazardous waste discharges and where applicable from source. The program should include targets and timetables and sector specific measures for industry, agriculture and health sectors.

3. Development of appropriate regulatory measures and the establishment of facilities for environmentally sound collection

and disposal of POPs. The present law does not address the disposal issues.

4. Establishment of environmental monitoring program of POPs including the development of assessment criteria based on internationally agreed quality assurance practices.

5. Development of awareness programs to promote the informed use of POP pesticides especially emphasizing good agricultural practices to limit the use of pesticides. IPM programs must be institutionally strengthened.

6. Establishment of institutional support services for information services for industry and agriculture on the safe handling and use of POPs, and environmental friendly technologies to prevent, reduce or eliminate POP pollution.

7. Strict enforcement of the present Pesticide Act and Rules for controlling POPs. The present regulations have some serious omissions with regards to pesticide residue and development and enforcement of standards. A competent organization with adequate facilities should be entrusted with these responsibilities, including the monitoring POPs.

8. Establishment of an effective mechanism for ensuring the implementation of relevant bilateral, regional and international decisions, recommendations, and agreements by assessing regularly whether specified measures to reduce POP pollution are being accomplished and strengthened as appropriate, such as institutions to deal effectively with the POP problem.

9. Establishment of a good network for information about lists of registered pesticides and POPs, from SAARC member countries RENPAP, UNEP, IFCS and other international agencies.

10. Adoption of appropriate policy instruments including regulations and conic instruments for phasing out POPs. These could be achieved through substitution with environmentally sound substances and best environmental practice. For this capacity building and awareness programs must be strengthened.

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Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal

Ashok Ratna Tuladhar
Consultant-Environment Specialist
PEIP- Project, Pokhara

Background

The 1989 Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (commonly known as "Basel Convention") is the first international attempt to deal with the global control of hazardous wastes and their disposal. The Preamble to this Convention, which entered into force in 1992, recognizes that:

- the most effective way to protect the human health and environment posed by hazardous and other wastes are to minimize their production in quantity and/or hazard potential.
- Countries should take measures to ensure that management and movement of wastes is consistent with the protection of both human health and environment, regardless of the disposal place.

The Convention also provides that:

- wastes should as far as possible be disposed of in the country of their generation with environmentally sound and efficient management,
- transboundary movement of wastes should only be permitted under conditions which do not endanger human health or the environment, and which conform with the provisions of the Convention.

In the context of developing countries, the Convention further recognizes:

- the increasing desire for the prohibition of transboundary movements of hazardous wastes and their disposal in other states (especially developing countries), and to reduce such movements to a minimum,

- the limited capability of developing countries to manage hazardous and other wastes, and

- the need to assist developing countries in environmentally sound management of hazardous and other types of wastes they may generate by way of technology transfer.

Overview of the National and Sub-regional Environmental Development Scenarios/Issues Relating to the "Basel Convention"

National Level

In Nepal, the Solid Waste (Management & Resource Mobilization) Act- 1987 for the first time defines "Hazardous wastes", refers to their categorization and prohibits their storage, dumping or improper disposal at any public or private places.

The Environment Protection Rules-1997 makes it mandatory for industries or businesses producing any types of hazardous wastes to conduct "Initial Environmental Examination (IEE)" and/or "Environmental Impact Assessment", depending upon their production capacity or hazard potential. EIA is compulsory for the construction of any hazardous waste management facilities such as waste management plants; waste resources recovery plants; landfill or disposal sites; waste storage facilities and waste treatment facilities in regard to lethal wastes, EIA is compulsory for:

- the management and disposal of any radioactive substances with a life period of more than 25 years,

- the management and disposal of any toxic chemicals with a minimum lethal dose of 50,

- the management and disposal of infectious biological wastes generated by health care institutions such as hospitals, health centers or nursing homes etc. with minimum 25 beds, and

- incinerating or reusing of any dangerous wastes requiring a minimum area of 1 ha. and energy accordingly.

Nepal's membership in the United Nations, affiliations with other international and regional organizations, and other influences and internal initiatives have helped Nepal to become a party to a number of international environmental instruments.

Protection of Biodiversity, Habitat and National Heritage

By now, Nepal has become a signatory to a number of treaties relating to the protection of biodiversity, habitat and national heritage. The four main treaties in this regard are:

1) Convention on Wetlands of International Importance Especially as Waterfowl Habitat ***(Ramsar Convention***- entered into force in 1975). Nepal acceded to this convention on 17. April 1988.

2) UNESCO Convention Concerning the Protection of the World Cultural and Natural Heritage ***(World Heritage Convention*** - entered into force on 17. December 1973)

3) Convention on the International Trade in Endangered Species of Wild Fauna and Flora ***(CITES***- entered into force on 1. July 1975). Nepal became a contracting party to the convention on 18. June 1975.

4) Convention on Biological Diversity (entered into force in December 1993). Nepal ratified it in September 1993.

Protection of the Global Atmosphere

Although many small countries like Nepal are least responsible for

contributing to ozone depletion and greenhouse effect, Nepal has ratified the ***Vienna Convention, Montreal Protocol*** and ***Convention on Climate Change*** in early 1994.

Environmental Protection (in general)

In addition to the above-described treaties, the following is a list of treaties to which Nepal is a party, together with an account of the obligations under the treaty and the incorporation (if any) of their provisions in Nepalese Legislation:

1) ***Plant Protection Agreement for the South East Asia and Pacific Region:*** Nepal became a party to this agreement on 12. August 1965.

2) ***Geneva Convention on High Seas:*** Nepal became a party to this convention 27. January 1963.

3) ***Treaty Banning Nuclear Weapons Tests in the Atmosphere, in Outer Space and Under Water:*** Nepal became a party to this treaty on 7. October 1964.

4) ***Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space Including the Moon and Other Celestial Bodies:*** Nepal became a party to this treaty on 10. October 1967.

5) ***Treaty on the Non-Proliferation of Nuclear Weapons:*** Nepal became a party to this treaty on 03. February 1970.

6) ***Treaty on the Prohibition of the Emplacement of Nuclear Weapons and Other Weapons of Mass Destruction on the Seabed and Ocean Floor and the Subsoil Thereof:*** Nepal became a party to this treaty on 18. May 1972.

7) ***International Tropical Timber Agreement:*** Nepal became a party to this agreement on 03 July 1990.

8) ***Bangkok Agreement on the Network of Aquaculture***

Centres in Asia and the Pacific: Nepal became a party to this agreement on 04. January 1990.

9) ***Convention on the Control of Transboundary Movement of Hazardous Wastes and their Disposal, (Basel Convention):*** Nepal ratified the Basel Convention in 1994, but has not as yet taken any specific steps to implement it through legislation.

10) ***Convention on Combating Desertification in those Countries Experiencing Serious Drought and/or Desertification, particularly in Africa:*** Nepal ratified this convention in 1994, but has not as yet taken any substantive steps to implement it to date.

Sub-Regional Level

In different regions of the world, a number of collaborative programs on environmental protection at the regional levels have also been instituted. The main advantage of regional forms of interstate cooperation is that it is often easier for close states to reach an agreement at the regional level, where there is usually less diversity of socio-economic characteristics between the particip ating parties than at the broader international level. For the region to which Nepal belongs, a South Asian Co-operative Environmental Program (SACEP) has been set up involving Afghanistan, Bangladesh, India, Iran, Maldives, Nepal, Pakistan and Sir Lanka. A ministerial meeting of these nations held in 1981 adopted a 6-point "Colombo Declaration on the Environment" for the sub-region, which has established a program for, inter alia:

- environmental impact assessment,
- environmental quality standards,
- watershed conservation,
- social forestry,
- wildlife protection,
- environmental legislation and
- environmental education and training.

An effective regional environmental effort is also expected from the South Asian Association for Regional Cooperation (SAARC) which proclaimed 1992 as the "Year of Environment" for its member states. There are already some successful cases of regional environmental cooperation on a simple bilateral basis. Followings are some of the examples.

- The Indus River Agreement between India and Pakistan is an example of a framework agreement enacted earlier between some of the South Asian countries.

- The 1987 agreement between Nepal and China to create huge protected area along part of their common border, embracing the existing Lamtang and Sagarmatha national parks in Nepal with the Qomolangma Nature Reserve in Tibet. In addition, Nepal has proposed to extend eastwards the Sagarmatha Park to double its current size to provide for a continuous protected zone along the northern flank of the Himalayan crest.

- Bi-lateral cooperation has also occurred with regard to wildlife conservation. Much of Nepal's wildlife is migratory, extending throughout much of South Asia and elsewhere. Twenty-five per cent of Nepal's bird species are migratory, and since 1987, Nepal and several other regional neighbors have participated in an international waterfowl census sponsored by the International Waterfowl Research Bureau (IWRB).

However, Nepal has yet to establish any major environmental accords and to improve the cooperation on transboundary environmental problems with its neighbors, despite the fact that ecological processes in the Himalaya clearly transcend international boundaries. For example, the devastating annual floods in the Ganges and Brahmputra basins might have been influenced by extensive deforestation and intensified land use in the Northern mountain watersheds. On the other hand, the So2-emissions from heavy industries in the nearby Indian states of Uttar Pradesh and Bengal

might have possibly generated acid rain over much of southern Nepal. India currently operates some nuclear power plants with a few more under construction. The 1986 Chernobyl accident has clearly demonstrated the dangers of radioactive fall-out, which can be widespread and unpredictable.

Existing Legal/ Institutional/ Administrative/ Management Measures for Implementing each Regime

In Nepal, there are a number of steps that need to be taken at the national level for a treaty to become binding on the signatory for implementation.

Legal Measures

Legal measures for the ratification and implementation of treaties in Nepal can be divided into the following two main categories:

- procedures relating to constitutional provisions and
- statutory implementation measures.

Constitutional Provisions

Under the Constitution of the Kingdom of Nepal 1990, the following three types of treaties require certain procedures for their ratification or acceptance:

1) A treaty that requires the ratification of, accession to, acceptance of or approval of a majority of two-thirds of the members present at a joint sitting of both Houses of Parliament. According to Article 126(2) of the Constitution, such treaties are categorized as relating to:

   i. peace and friendship,
   ii. defense and strategic alliance,
   iii. boundaries of the Kingdom of Nepal, and
   iv. natural resources, and the distribution of their uses, which is not ordinary in nature and which may affect the nation extensively, seriously or in the long-term.

2) A treaty or agreement that requires the ratification, accession to, acceptance or approval of a simple majority of members present in the House of Representatives. This procedure applies to treaties that fall under sub-classes (i) and (iv) Article 126(2), in which the treaty or agreement is of an ordinary nature that does not affect the nation extensively, seriously or in the long-term (Article 126(2)).

3) A treaty that does not require an act of ratification for its commencement. This may occur only if a treaty or agreement does not fall into the four categories of treaties or agreements under Article 126(2) of the Constitution (see (1) i - iv above).

Statutory Implementation Measures

Once a treaty has been approved or acceded to, usually through parliamentary processes, the state must incorporate and internalize the treaty obligations into domestic law. Formal implementation of treaty obligations may be in the form of legislation and/or policy measures. Some legal systems regard treaties as automatically part of domestic law by virtue of ratification; others require separate implementing legislation.

1) Section 9(i) of the Nepal Treaty Act (NTA), 1991 deals with all matters in a treaty to which Nepal is a party by having ratified, acceded to, approved or accepted the treaty by Parliament, and specifies that when a matter in a treaty is inconsistent with the existing domestic laws, these laws shall be void to the extent of the inconsistency, and the provision of the treaty shall prevail as the law of Nepal, thus explicitly providing for the primacy of international treaties over national law.

2) Section 9(ii) of NTA also states that when any treaty to which Nepal has become a party, but which has not been ratified, acceded to, approved or accepted by Parliament, creates an additional obligation or burden on the Kingdom or HMG

that requires the enactment of legal provisions, HMG shall, for the implementation of such a treaty, initiate timely processes to enact such laws.

Transformation of Treaties in Nepal

There is no systematic approach to the adoption of treaties into the municipal law. There are no consistent methods for incorporating treaties into national legislation. However, some of the more common methods can be described as follows:

- Statutory incorporation of a complete text with reference to the treaty,
- Statutory incorporation of a complete text without reference to the treaty,
- Partial incorporation or adjustment of treaty provisions in a statute without reference to the treaty, and
- Incorporation of treaty provisions in delegated legislation (regulations) without reference to the treaty.

A systematic approach for transforming international environmental instruments into internal law is poorly developed in Nepal. No effective legal and administrative implementation measures have been taken to fulfill the obligations of international environmental treaties, conventions etc. to which Nepal is a party.

Status of Treaty Provisions in National Courts

Notwithstanding the Nepal Treaty Act (NTA)-1991, Nepal's practice in implementing treaty provisions is still developing. The majority of treaty provisions are not correctly incorporated into national laws, and also have ineffective implementation processes.

Theoretically, unless otherwise provided in the constitution or national law, a treaty cannot be invoked before the courts for the purpose of conferring rights on individuals. Therefore, an unincorporated treaty has no formal standing before the court. In principle, once a treaty is incorporated into domestic legislation, it is recognized as being applicable by domestic courts. However, a

treaty may be invoked on a collateral issue, which the courts may have to determine before adjudicating the rights of the parties to the case. To date, the Constitution of the Kingdom of Nepal and the prevailing law do not include provisions that allow an individual to invoke treaty provisions before the courts.

Institutional/ Management Measures

Appropriate and effective institutions are fundamental to the implementation of environmental policies, legislation and international environmental instruments. The institutional development measures in this regard can be described as follows:

1) The National Commission for the Conservation of Natural Resources (NCCNR), to be established pursuant to Section of the Soil & Watershed Conservation Act, 1982 under the Ministry of Forest and Soil Conservation with the minister as chairman, never became functional.

2) The need for a high-level multidisciplinary body for the formulation of environmental policy and for overseeing the implementation of these policies prompted the creation of the Council for the Conservation of Natural and Cultural Resources (CCNCR) in 1990 under the auspices of the National Planning Commission. The main functions of CCNCR are:

   - to prepare national policy related to the conservation of natural and cultural resources,
   - to oversee the implementation of national policy related to the conservation of natural and cultural resources through governmental and non-governmental organizations and the private sector, and
   - to monitor and follow-up the progress and effectiveness of the program and provide necessary advice to the related agencies.

However, a major shortcoming during the establishment of CCNCR in 1990 was the lack of environmental policy at the national level.

3) A specific environmental policy was for the first time formulated by the government in 1992. The Eighth Five Year Plan included a separate chapter on 'Environment and Resource Conservation', which suggested the establishment of a high-level Environmental Protection Council (EPC) to formulate policies, issue directives and establish inter-sectoral coordination and monitoring related to environmental management. The EPC was established in 1992 under the chairmanship of the Prime Minister, with representation from government ministries, the Natural Resources Committee of the House of Representatives, the National Planning Commission (NPC), NGOs and the Federation of Nepalese Chamber of Commerce and Industry. The EPC is primarily a staff agency with the following functions:

- determining national policy for environmental planning, pollution control, EIA and national heritage conservation,

- assessing the environmental and social impacts of projects likely to have significant effects on the environment in order to adopt appropriate mitigation measures,

- ensuring inter-sectoral coordination between different government ministries with respect to environmental issues,

- monitoring international efforts for environmental protection and sustainable development,

- reviewing or conducting periodic studies of existing provisions in environmental law, making necessary reforms and enacting new laws as and when required, and

- developing a national system of pollution control, establishing environmental standards and ensuring their implementation.

These functions are broad enough to enable any organization to work successfully towards preventing environmental degradation and promoting sustainable development. The EPC has carried out several important activities, including initiatives for tabling international environmental instruments through sectoral ministries, in Parliament. Despite a broad mandate, the EPC had not been able to work as effectively as it could, due to several shortcomings. As it was established only by an executive decision, it lacked the authority of a statutory body.

After the establishment of Ministry of Population and Environment in 1995, the Ministry undertook this responsibility. In late 1996, after several years of negotiation and redrafting, the Environmental Protection Bill was tabled in Parliament and passed into law. At present, the Ministry of Population and Environment serves as the secretariat for the EPC.

4) The Constitution of the Kingdom of Nepal-1990 provided for the establishment of a "Natural Resources and Environment Committee" in the House of Representatives. The Committee has existed since July 1991. The Environment Protection Act -1996 provides for the EPC to be established as a statutory body and makes EIA, pollution prevention and control, and environmental conservation measures mandatory. As multi-party democracy matures in Nepal, the efficacy of such parliamentary committees is expected to improve.

5) Certain ministries and departments have set up environment units to oversee environment-related policies and programs and activities. Ministries/ departments with an environment unit include:

- Ministry of Forest and Soil Conservation,
- Ministry of Industry, and
- Ministry of Housing and Physical Planning.
- Department of Roads.
- Department of Industry.
- Nepal Electricity Authority

Adequacy or Inadequacy of the Existing Arrangements

It is apparent that there is a significant gap between international environmental instruments and their domestic implementation in Nepal. The present legislation (Environment Protection Act, 1996) has not been effectively enforced, and further legislation is required as a basis for adequate implementation of the international instruments so far ratified by HMG. In addition, the ministries responsible for implementing international environmental instruments have not taken the state's commitment seriously. Since no specific agency is responsible for overseeing domestic implementation of such instruments, international treaties are often overlooked.

For instance, Nepal ratified the ***Basel Convention*** in 1994, but has not yet taken any specific steps to implement it through legislation.

Legal/ Administrative Arrangements

Notwithstanding Nepal's inconsistent approach to implementing the obligations of international treaties in domestic legislation, there is evidence of a growing national awareness of domestic environmental problems. As a result, there are many national legal measures that relate to international environmental law, albeit many of them are ineffective, either because of inadequacies in their drafting or because of lack of resources to adequately implement them, or both.

Only a central environmental policy-making body at national level should be responsible to incorporate international environmental treaty obligations, which exert some specific influence, into national environmental policy. This body should also be able to recommend amendments to the existing legislation, write drafting instructions for new laws, and monitor the implementation of policies and the compliance of legislation. However, the implementation of such policies and legislation should be the responsibility of the sectoral ministries and departments.

Institutional/ Management Arrangements

Appropriate and effective institutions are fundamental to many

shortcomings in the present institutional structure in Nepal. So far as the adoption of international environmental instruments and their implementation at the national level is concerned, there is a need for a high-level cross-sectoral policy-making body, mainly because many international environmental instruments are both specific and cross-sectoral in nature. Institutional strengthening by linking agencies at both vertical and horizontal level, between the EPC, NPC and Ministry of Population and Environment on one hand, and between the sectoral ministries and departments on the other, has yet to evolved.

Although the EPC now has statutory backing of the Environment Protection Act 1996, the shortcoming of the current framework is that EPC's functions are not adequately spelled out in the legislation. Its advisory status impedes the EPC from taking effective measures for implementing international environmental instruments and environmental conservation measures. HMG may constitute the Environment Protection Council, having the representation of environmental experts and political parties recognized as national party, to provide:

- policy guidance and advice to His Majesty's Government and
- coordination among various agencies in the area of environment protection and conservation.

These legal and institutional issues certainly need to be resolved if the government is committed to constructive and efficient environmental conservation in the Kingdom and the fulfillment of its obligations to international environmental instruments.

Recommendations for Enhancing the Effectiveness and Efficiency of the Implementation of Each Regime

As HMG is bound under the Nepal Treaties Act to take measures for the implementation of treaties to which Nepal is a party, the following recommendations need to be taken into consideration to enhance the effectiveness and efficiency of implementation of each regime.

Legal/ Administrative Measures

Reinforcement of Legal Measures

National enforcement mechanisms must be developed and enforced by the state as required by the international instruments in order for the state to fulfill its international treaty obligations. In this regard the following recommendations deserve due consideration:

- Strengthening the role of the judicial system in environmental policy disputes. At the local level, give greater recognition to the role of community-based dispute resolution processes. At the national level, establish a specialist environmental court or tribunal to handle regional and national disputes. Remove barriers to public interest litigation and to the provision of environmental legal aid.

- Streamlining administrative dispute resolution and law enforcement procedures so as to overcome current jurisdictional overlaps and inconsistencies.

- Providing for more stringent penalties for violation of environmental laws: economically debilitating fines and heavy goal sentences. For less serious offenses, use of environmental community-service orders (e.g. planting trees, or cleaning up rubbish).

- Ensuring strict liability to those who deplete natural environment & resources or damage ecosystems or human health.

- Making compensation payable to victims of environmental damage.

The Government should take legislative and administrative measures to implement the "1989 Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal."

Institutional/ Management Measures

Strengthening Institutional Arrangements at the Central Level

Major recommendations for the institutional strengthening of a central autonomous environmental protection agency are:

- The agency should serve as the apex body to oversee the implementation of international environmental instruments across all sectoral ministries.

- The agency should be adequately supported with its own secretariat.

- The regulations under the Environment Protection Act, 1996 should give a specific mandate to the agency in relation to the implementation of international environmental treaties.

- The membership, functions and administration of the agency should be spelled out in detail in regulations under the Environment Protection Act 1996.

Institutional Strengthening at the Ministry/ Department Level

Consideration should be given to adopting the following recommendations at the ministry /department level:

- Sectoral ministries should be required by law to follow the directives of the central agency, both in terms of the implementation of international environmental treaties, as well in relation to all aspects of the implementation of the Environment Protection Act.

- AS HMG is committed to set up environmental units in all relevant ministries /departments to integrate environmental concerns into the planning and development process, the precise role of these units detailed so as to fit into the existing institutional framework.

Capacity Building and Awareness

The changing nature and dimensions of environmental problems at the national, regional and international level will require the development of a more sophisticated environmental capacity building programme and awareness among the population.

Community Participation

In the changed context of today, community participation in the policy process can help change societal values towards a greater appreciation for the environment. Political participation is the foremost instrument of civic education. An individual's ability to participate in public debate is closely linked with economic and political power. However, a potential danger in the participatory strategy is the possibility for the major benefits of any development program to be captured by local elites. Having the political knowledge and power to influence outcome in their favor, it is often the traditional rural elites who are best able to participate. In general, women, low-caste and various ethnic groups are significantly disadvantaged in terms of socio-economic status. Thus, any process of legal and institutional reform has to be linked to a broader strategy of social change.

Procedures for community participation in all phases of environmental planning and management are to be provided at all levels of government.

Environmental Information

Recommendations are to:

- Enhance facilities and management capability to monitor environmental conditions and to make use of available information.
- Improve the environmental capacity of government agencies and institute an adequate system for the storage and exchange of environmental information between authorities.

Environmental Education

Recommendations are to:

- Emphasize environmental legal education of lawyers and introduce a course on "Environmental Law & Policy" at the university level.

- Provide for on-going environmental training of administrative personnel so that they can translate policy objectives into reality and effectively manage multi-dimensional environmental programs.

- Ensure the participation of women and of minority group representatives in environmental law and policy education programs.

To effectively integrate opposing environmental and economic considerations in policy development necessitates that the affected interests are able to make educated value choices. The diversity of values involved in policy formulation requires a close interaction between affected individuals and communities whereby the implications of their preferences become clearer and they are encouraged to understand the concerns and values of other interests. The overall emphasis should be upon establishing a framework for rational dialogue, mutual education and joint problem solving.

The international community as a vital prerequisite to the achievement of an environmentally sustainable societal has recognized the importance of providing for greater community participation in environmental policy making. The IUCN argues that building support for sustainability involves more decentralized, small-scale and community-based close cooperation with local people and being adapted to local environmental conditions. The World Conservation Strategy for the 1990s argues in favor of "empowering of communities" in environmental policy-making. The Strategy calls for the development of process of "Primary

Environmental Care" (PEC), "by which local communities organize themselves and strengthen and apply their own capabilities for the care of their environments and satisfaction of their own needs." A number of "priority actions" for community empowerment are identified to:

- ensure that communities and individuals have access to natural resources and security of tenure.
- support a community system of property rights and resource management.
- provide communities and individuals with access to financial resources and incentives for sustainable practices.
- develop environmentally sound technologies with the communities that will use them.
- develop an information partnership with communities.
- enhance community capacities to organize and participate in decisions.
- enhance community capacities to influence development priority policies and projects.
- support the development of infrastructure for the exchange of information and technical assistance among communities.
- provide communities with the opportunity to prepare local strategies for conservation or sustainable development.

Chronology of Environmental Legal - Institutional Developments in Nepal Since 1950

1950 Establishment of first school of forestry.

1951 Ministry of Forestry set up.

1952 Royal Land Commission formed to promote national land reform.

1952 Department of Archaeology established for the maintenance, renovation and preservation of archaeological, historical and cultural sites.

1956 Ancient Monuments Protection Act enacted to provide for the protection of ancient monuments and the control of trade in archaeological objects.

1957 Commencement of national economic planning with first Five-Year Plan (1957-62).

1957 Land Reform Act promulgated.

1957 Private forest Nationalization Act enacted to nationalize all privately -owned forest without payment of compensation.

1957 Founding of Royal Nepal Academy to encourage, protect and publicize Nepalese literature, art and culture.

1958 Wildlife Conservation Act passed (enforced until 1962).

1958 Land Related Act.

1961 Forest Act introduced to encourage decentralized forestry management through the Panchayat system.

1961 Land Acquisition Act.

1961 Aquatic Animals Act enacted to safeguard fishery resources.

1962 Second periodical development plan (1962-65) commences, with emphasis on land reform, food production and transport-communications infrastructure.

1962 Land (Measurement) Act promulgated for the measurement and categorization of land resources.

1964 Guthi Corporation Act introduced to establish the Guthi trust.

1964 Land Related Act enacted to make provision for land holding, land revenue and land ownership arrangements.

1965 Nepal Association of Fine Arts established with a view to encouraging local artists.

1965 Third Five-Year Plan (1965-70) launched, giving emphasis to increased food production, land reform, forest management and cultural heritage conservation and urban sanitation.

1967 Rapti Doon Development Area, Land Management (Sale Distribution) act enacted to facilitate land distribution and resettlement of landless people in that region.

1967 Land Administration Act enacted, providing for institutional development, land registration, cultivation and revenue collection.

1967 Irrigation, Electricity and Related Matters Act enacted to prohibit activities that create soil erosion, floods or landslides, as well to maintain the quality of water supplies.

1967 Forest Conservation (Special Arrangements) Act introduced to control forest-clearing activities and to provide for the judicial settlement of disputes.

1970 Fourth Five-Year Plan (1970-75) was formulated giving emphasis to the development of special areas of national priority. Regional development planning concepts emerged.

1971 Jhara Area related Act promulgated.

1972 Plan Protection Act enacted for the restriction of the export and import of plant and plant products that may carry disease through quarantine stations.

1973 National Parks and Wildlife Conservation Act promulgated for the conservation of important ecological areas and the protection of endangered wildlife.

1974 Department of Soil and Water Conservation established.

1974 Public Road Act provides for land acquisition during road construction and to promote revegetation of roadsides.

1975 Fifth Five-Year Plan (1975-80) launched with emphasis on land-use planning and development.

1978 Panchayat Forest, Panchayat Protected Forest Rules and Leasehold Forest Rules promulgated in order to promote decentralized forest management and encourage community participation forestry conservation.

1978 Tourism Act instituted.

1979 Mountaineering Rules promulgated under the Tourism Act, with environmental controls on mountaineering activities.

1980 National commission for the Conservation of Natural Resources organized with the object to coordinate the development of environmental policy among government authorities.

1980 Department of National Parks and Wildlife Conservation set up.

1980 Sixth Five-Year Plan (1980-85) commenced with greater consideration of environmental policies and programs.

1982 Environmental Impact Study Project established to study the environmental sequence of selected development projects.

1982 Soil and Water Conservation Act enacted in order to promote environmental equal of selected development projects.

1982 King Mahendra Nature Conservation Trust Act establishes the organization of that title with the mandate to promote conservation and management of natural areas and wildlife.

1982 Nepal Environment Conservation Group established as a non-government organization to promote community environmental awareness.

1983 International Center for Integrated Mountain Development founded to address mountain development issues of its member countries.

1983 International Union for the Conservation of Nature and Natural Resources establishes a project office in Nepal.

1984 Nepal Electricity Act enacted.

1985 Seventh Five-Year Plan (1985-90) initiated.

1985 Nepal Heritage Society founded.

1985 National Main Policy issued containing several environment - related policies.

1985 Nepal Forum of Environmental Communicators established.

1986 Jarajuri Trust created to recognize and support local initiatives in the field of soil and water conservation.

1986 Pashupati Development Trust established.

1986 Annapurna Area Conservation Project inaugurated, administered by the King Mahendra Trust for the Conservation Nature.

1987 Solid Waste (Management and Resource Mobilization) Center Act enacted for the collection, transport and disposal of urban solid waste materials.

1987 Two environmental NGO's, Leaders Inc. and Forum for Environmental Lawyers established.

1987 Environment and Resource Conservation division established within the National Planning Commission Secretariat to provide for the inclusion of environmental factors in development planning.

1987 Environmental Camps for Conservation Awareness established as an NGO.

1987 National Conservation Strategy document endorsed in principal by His Majesty's government of Nepal.

1987 Basic needs program highlighted the need for soil conservation, potable drinking water and environmental sanitation.

1988 Environment Management Unit organized within the Department of Roads to undertake environmental impact assessment studies for various road construction projects.

1988 Master Plan for the Forestry sector endorsed in principal by government with an institutional proposal for a National Authority for the protection of the Environment to be headed by the Prime Minister with coordinating and enforcement powers.

1989 Eight Five-Year Plan (1990-95) prepared, with a major objective to promote environmental management and natural resources conservation.

1989 Forestry Bill drafted to provide for the implementation of the Forestry Master Plan.

1990 Policy Guidelines of the Interim Government issued with the requirement that no new major development projects are to proceed which have potential adverse environmental sequel.

1990 Panchayat system abolished by the Interim government which in place introduces the Municipality Act, District Development Committee Act and Village Development Committee Act. New administrative units given various environmental management responsibilities.

1990 Council for the Conservation of Natural and Cultural Resources established.

Organization of Government Ministries and Departments with Their Environmental Responsibilities

MINISTRY	DEPARTMENTS	ENVIRONMENTAL ISSUES
Agriculture	Agrarian production, Agriculture Marketing Services Livestock Development and Animal Health	Animal husbandry, soil agro-technology, and plant quarantine.
Communication	Information Radio Nepal, Nepal Television	Reporting and coverage of environmental news.
Defense	Surveillance of national parks.	
Education and Archaeology Culture	Nepal Central Library Regional Directorates	Ancient monuments, museums, archives, art, education-general.
Finance		Allocation of funds, coordination of foreign aid.
Forestry/Soil Conservation	Forests Medicinal Plants National Parks and Wildlife Conservation Soil Conservation and Watershed Management	Forestry management, herbariums, protection of ecosystems and endangered wildlife, soil and wildlife, conservation.
Housing and Physical Planning	Housing and Physical Planning	Urban Planning and development, Housing
	Resettlement	design, sewerage, sanitation and pollution control, and rural settlement.

Industry	Industrial development	Cottage and Village Industry mining and technology.
Land Reform and Management	Land Reform Geodetic Survey Land Revenuel	Reform of land tenure, land surveying and mapping.
Local Development		Community-integrated rural development, rural labor markets and decentralization.
Supply		Sale and Distribution of forest timbers.
Tourism	Tourism Civil Aviation	trekking and mountaineering activities. Hospitality industry,
Water Resources	Irrigation and Hydrology Electricity	Utilization of surface and ground water irrigation works, electricity, flood control and meteorology.
Works and Development	Roads Transport	road, rail and bridge construction Land/water transport,

Other Government Agencies and Statutory Bodies with Environmentally relevant Responsibilities

Agricultural Development Bank	Provides financial assistance to small farmers.
Guthi Sansthan	A religious trust responsible for the maintenance and protection of temples and other religious sites.
King Mahendra Nature Conservation Trust	Administers the Annapurna Conservation area Project and wildlife conservation programs.
National Planning commission	Located in the Cabinet Secretariat, this advisory body is responsible for the formulation, evolution and monitoring of periodic national development plans.
Royal Nepal Academy of Science and Technology	Fosters scientific and technological development.
Solid Waste Management Resource Mobilization Center	Responsible for the collection and disposal of solid wastes in the Kathmandu Valley.
Water and Energy Commission	Located within the Water Resources Ministry that is responsible for formulating policy on utilization of water resources and alternative energy supplies.

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Session IX

Compliance and Enforcement And Application of Economic Tools for Environmental Management

Dr. Jagadish C. Pokharel

The purpose of rules and laws is to control or change human behavior. In the environmental regime this implies changing individuals or groups' resource using behavior such an consumption, of water, land, air and others. Two behavioral dimensions are involved in changing human behavior-change in existing behavior and introducting new behavior.

Studies show that it is easier and less costly to introduce new behavior but changing the current behavior, which is rooted in the past, is difficult. This has very important implication for the effectiveness of enforcement of rules and regulations in any society.

Every regulation implies cost of enforcement and also the cost of changing behavior. Such cost can be immediate and in the longer term and it can be tangible and intangible. An effective and appropriate rule for a particular society is the one that imposes least cost in both dimensions.

Humans change, their behavior only when they are **willing to** or **forced to.** The willingness is strong when the benefit for the actor is direct and immediate in changing behavior. This benefit is reflected in the interest of the individuals concerned. Therefore, an approach that enhances willingness of the humans for environmental protection is considered effective. IN economic terms this willingness comes from positive incentives such as tax rebate, subsidies, and other benefits to he actor. There are other approaches, which help enhance the willingness through behavioral changes. These are education, awareness, moral lessons, enhanced value systems, and other intangible activities that target behavior of an individual.

The second way to change behavior is by forcing the actor through some kind of section. In this approach, the actor should feel the pain or loss for not changing behavior. Legal provisions for penalty and liability are such approaches. The effectiveness of such an approach in changing behavior depends on the strength and commitment with which the enforcer tries to enforce the rules.

The behavioral change of an actor is also a matter of its ability to resist the applied force. The resistance of an actor is a total force process that the actor applies to not change its behavior. The resistance is a dynamic process. It can change over time and with changing context. When the total resistance power is greater than the force applied for change then the rules do not make any effect on the actor. If for example, the polluting actor does not feel the burden of penalty or can get away with it easily then it will ignore the rules nada continue with current behavior. The source of such ability to resist originates from material source such as money the actor possesses and also mental sources such as has the determination or commitment of the actor to take the brunt of pain which increases the actors ability to bear the cost and ability to wait and buy time. If the actor can demonstrate its ability to bear the pressure for a long time then the applied forces (rules) are useless to achieve the change. Any tool for behavioral change, therefore, should be such that it makes the actor believe that its best option now and in the longer terms is to abide by the rules. In other words the actor should have *no better alternative to comply with the rule*. For any tool to change the behavior of the actor either it should make the actor realize that it is beneficial for the actor to change the behavior or should make the actor realize that to comply with the rule is the only best option.

Economics of Environment

In economics the environment is viewed as a composite asset that provides a variety of services. It provides the life support systems that sustain over very existence. Likewise, environment provides the economy with raw materials, which uses this transformation. So, if he environment is defined broadly enough, the relationship

between the environment and a closed system. This has led to the development of a policy of sustainable development promoted by World Commission on Environment and Development, which has been widely adopted by governments around the world.

In this scenario, need or economic efficiency has been felt necessary in our development vis-à-vis pollution abatement activities. According to the benefit cost criteria, the aim of public investment in pollution control should be to maximize the present value of net benefits accruing to the to the community. In principle, investment in pollution abatement should expand to he point where the marginal benefits of abatement equal to the marginal costs. It has been argued therefore that direct regulations are economically inefficient, and that poorly designed systems of direct regulations can and do result in high costs of compliance.

Economics (market based) instruments if various kinds are currently in use to manage the environment. In general, it has favored and adopted tradable permits, while some European and Asian Countries have tended to use effluent charges. Many other countries have used increased taxes on inputs that cause pollution. In most cases some form of direct regulation has invariably supported the use of economic instruments. Generally, the use of economic instruments has been favored for the following reasons:

- It is proactive than reactive
- It often uses positive incentives than coercive
- It is cost effective
- It encourages investment in clean technology
- It is easier to administer
- It encourages fair competition in market

Direct Regulations and Economics Instruments

Direct Regulations, known as " Command and Control" regulation, typically set environment standards, discharge limits or other prohibitions (either technology - or performance based) for all

regulated sources. Direct regulations usually specify technologies in case where it is difficult to monitor performance. Effluent standards may be set for a given industry to establish minimum efficient quality requirements.

Economic instruments try to remove market barriers, which encourages competition and efficiency in the market.

Effluent/Emission Charges: An emission /effluent charge is a fee, collected by government levies on each unit a pollutant emitted into air, water or land. The total payment any source would make to the government could be found by multiplying he fee times the amount of pollution emitted. Emission charges reduce pollution because the pollution costs money to a firm. With an emission charge system the firm. With an emission charge system the firm saves money by adopting cheaper new technologies. Thus the emission charge stimulates technological advances in emission reduction. This too is effectively used in controlling industrial and vehicular pollution in the developed countries and some developing countries.

Transferable Emission Permits and Tradable Permits: Under this system, all sources are required to have permits. Each permit specifies exactly how much the firm is allowed to emit. The permits are freely transferable. The control authority issues exactly the number of permits needed to produce the desired emission level.

This leads to the equalization of marginal abatement costs. This permit is discharge or effluent limit that once they have been allocated can be traded subject to a set of prescribed rules. Depending upon the system, permits can be traded externally (between different enterprises) or internally (between different discharge points of the same enterprises). As with effluent charges, tradable permit schemes can encourage innovation and flexibility in pollution prevention and control.

Adjustment of Subsidies: this process tries to hold prices of products below private costs of production, through subsidies.

Product Taxes: it can act as a surrogate for emission charges

particularly when emissions cannot be easily monitored. Taxes can be applied to input (e.g. fertilizers, detergents) which lead to pollution from different sources. Product taxes can provide incentives to minimize the use of polluting products and/or to encourage the use of alternative products.

Deposit Refund System: A consumer uses certain services against a guarantee of advance deposit for recycling he product. The method has been effectively used to recycle and reuse certain products such as food container, plastic and domestic appliances.

Transfer of Property Right: Environmental resources have characteristics of common property. When boundaries are delineated and rights over the property are ensured to certain community or individual owner, then there is more efficient management of resources.

Nepal's Attempt to Use Regulatory and Economic Instruments

Nepal's practice for using economic instruments has been very recent and limited to certain sectors only. Globally the promulgation of Environment Protection Act 2053 and subsequent Rules and Regulations 2054 are the beginning of such attempt to change behavior of various actors affecting environment. Both the behaviors - past and present and future, have been the target.

Following are some of the examples of Nepal's attempt to change the behavior using economic incentives and direct regulations.

- Article 8 of the Act gives authority to the environmental inspector to punish the actor Rs. 5,000/- fine.
- Article 17 makes provision for compensation. Any actor who creates nuisance of any is liable or compensation.
- Article 18 makes the actor punishable with up to Rs. 100,00 for their action that go against the process a licensing certain activities.
- An actor who behaves against the laws within this act is punishable with up Rs. 50,000/- for this action.

In Nepal's Environmental Protection Act, the economic tools applied to different actors to influence their behavior are the following:

- All activities require assessment against environmental impact. If any activity is damaging to the environment the actor should devise mitigate measures. Or should pay for such mitigation measures.
- No one can do any action affecting the existing environment significantly adversely.
- There are more detailed provisions for discouraging the polluter by imposing cost on the their actions, such as making the polluter pay the cost of cleaning up ad an addition 25% of the total cost.
- Also it is forbidden to destroy the items included in the national heritage list archeological sites, items, plants, and wildlife. Any such action can be liable in the court.
- An actor cannot have to follow approval processes while using the natural environment fishing, hunting, forest clearing, trading, mining and conducting certain commercial activities.

While the Act is predominantly 'coercive" there are certain provisions which try to influence ones behavior by enhancing willingness through tangible and intangible incentives. Some of these techniques include:

Subsidy: The existing policy discourages use of chemical fertilizers and pesticides by removing subsidies for these items and encourages organic substitutes through subsidy provisions. The government is replacing polluting vehicles such as diesel-run autos with cleaner technologies such as the battery and LPG run autos.

Emission Charges: The environmental protection does permit the government to introduce emission charges and taxes to control industrial and vehicular pollution but it is yet to be introduced.

Market Permit: The government has set a standard for vehicular

emission and a maximum permissible emission level has been fixed for both diesel and petrol run vehicles. However, it is yet to be effectively enforced.

Transfer of Right: The transfer of rights has been quite effectively used in managing the forest and thus affecting the environmental quality. The concept of community forestry, leasehold forestry has been popular. In these cases, the ownership of the property has been transferred from the government to the user community.

The Deposit Refund: Certain producers such as Pepsi, Coke, introduce this system, etc., which is also showing good, results. Consumers do recycle the container to get their advance deposit back.

Other Incentives

- Individuals and institutions who make substantial contribute to environment and national heritage are rewarded with cash prizes.
- Similarly industries that contribute to environmental protection are awarded a special insignia recognizing such contribution.
- Schools and colleges receive special resources from the Environment Protection Fund for certain activities and for introducing school curricula. Similarly special training is organized to influence the behavior of adults and decision makers.

Whereas these tolls are used more or less effectively, other tools are being expl9red for greater effectiveness. They include strategic planning tolls, macro economic planning tools, participatory rule making and consensual approaches, including greater decentralization in planning and rule making. It is assumed that some of the techniques used to involve major stakeholders in these processes will increase compliance and make it easier for enforcement.

Conclusion

Rules and regulations can be effectively enforced when the options available for an actor not to abide by the rules are less attractive than the ones suggested by the rules. In Nepal the options for an actor to not abide by the rules, in most cases, are more attractive than the ones suggested by the rules. This is one of the major factors affecting the compliance rate. Among other reasons, the overall economic condition of the society is an important one. The Nepalese society is just entering into the market system. Some of the basic rules for effective functioning of market tools do not apply. This affects both the enforcement of market incentives by the state and also the willingness of the actors to comply with these rules. This suggests a constant refining and revisiting of these tools. The existing practice is only the beginning.

Session X

Prior Informed Consent Convention

Uttam K. Kunwar, Ph.D,
Nepal Bureau of Standards and Metrology

Summary: *Since long time, the World community has addressed a number of issues regarding the trans-boundary movement of hazardous chemicals and their management. Two recent efforts that stem from the 1992 UN Conference on Environment and Development (UNCED) are the negotiation of the convention on prior informed consent (PIC), which was signed in September 1998 and the convention forbid to export or import the listed chemicals under this convention from or to a non member to the convention. At the moment this is placed with the Secretary General of united Nation to be rectified by 50 countries before it comes into force. The basic objective of the convention is to safeguard human life and environment against the improper use of hazardous chemicals and pesticides.. The sharing of information on banned or severely restricted chemicals assures environmentally safe management for the protection of human life and environment.*

Background

In the days following the Bhopal tragedy, one senior official with IPS, searched for references to MIC in Encyclopedia on Safety and Health, which has over the past 50 years chronicled chemical dangers and has more than 2,000 extensive articles. The officer was shocked: " You don't even find MIC in there!" Upon further searching it was discovered that this information gap extends for virtually all the intermediate chemicals used in pesticide formulation[1].

The Jan Huismans, the UNEP official responsible for maintaining the International Registry of Potentially Toxic Chemicals (IRPTS) found that when the accident at Bhopal occurred, " MIC was not on our list. In fact none of the intermediary chemicals were on it

[1] The Bhopal Syndrome, David Weir; Earthscan Publication Limited, London; 1987

because the governments themselves don't know them.

When the century begins, neither human numbers nor technology has the power to alter the planetary system. As the century closes, not only do vastly increased human numbers and their activities have that power, but major, unintended changes are occurring in the atmosphere, in soils, in waters, among plants and animals, and in the relationships among all of these[2]. One of the major contributors to bring about these unwarranted changes is the extensive use and misuse of chemicals in one form or another.

Between 1950 and 1985, the world cereal production outstripped population growth, increasing from around 700 million tonnes to over 1.8 billion tonnes, an annual growth rate of about 2.7 percent. And the UN Food and Agriculture Organization (FAO) were forecasting record-breaking cereal supplies of over the coming years. This growth in food production is due largely to a 'phenomenal rise in productivity. One of the main reasons amongst other is the extensive use of pesticides and similar chemicals. "Pesticides once were called **"Wonder drugs"** in the United States and it was the **"Medicines for food"** in the developing world. They stimulated crop yield undreamt of by our ancestor farmers, and today, it is a common belief that we cannot grow food without them.

Growth in international trade of chemicals for industrial use or chemicals formulation for pesticides during the 19960s and 1970s led to global concern over their use. The gravity of situation was very high particularly in developing countries that lacked the expertise or infrastructure to ensure their safe use.

What Led to the Elaboration of the Prior Informed Consent (PIC) Convention?

Recognizing the need for urgent action, the world community put the issue of hazardous chemicals and chemical formulation for pesticides in its agenda. This concern prompted the development of

[2] Our Common Future, The 'Brundtland Report' Explained (A reader's Guide); IIED/Earthscan, 1989

the "International Code of Conduct for the Distribution and Use of Pesticides" by the Food and Agricultural Organisation of the United Nation (FAO) and the "London Guidelines for the Exchange of Information on Chemicals in International Trade" by United Nations Environment Programme (UNEP)

International Code of Conduct for the Distribution and Use of Pesticides

"Information Exchange and Prior Informed Consent (PIC)" procedure is included in Article 9 of the "International Code of Conduct for the Distribution and Use of Pesticides". It was adapted by the 25th session of the FAO conference in November 1989. Participation in PIC procedures requires that countries that take action to ban or severely restrict the use or handling of a pesticide for health or environmental reasons should notify FAO. Thirty-four percent of developing countries responding to this question in 1993 reported that their country never notified the FAO [2].

London Guidelines

"London Guidelines For the Exchange of information on Chemicals in International Trade" (Amended 1989). This set of Guidelines was addressed to Governments with a view to The voluntary procedure of PIC procedure was included in assisting them in the process of increasing chemical safety in all countries, through the exchange of information on chemicals in international trade [1].

In 1989, both instruments were amended to include the voluntary Prior Informed Consent (PIC) procedure to help countries to make decisions on the import of chemicals or chemical formulation for pesticide that have been banned or severely restricted

Managed jointly by the FAO and UNEP, the PIC procedure is a means for formally obtaining and disseminating the decisions of

[1] London Guidelines for the exchange of Information on Chemical in international Trade, Amended by decision of 15/30 of the governing council of UNEP on 25 May, 1989

[2] Amended to include PIC in Article 9 as adopted by the 25th session of the FAO conference in November, 1989

importing countries on whether they wish to receive future shipments of such chemicals. The aim is to promote a shared responsibility between exporting and importing countries in protecting human health and the environment from the harmful effects of certain hazardous chemicals being traded internationally. The voluntary PIC procedure is designed to:

- help participating countries learn more about the characteristics of potentially hazardous chemicals that may be imported;
- initiate a decision-making process on the future import of these chemicals; and
- facilitate the dissemination of these decisions to other countries.

Genesis of PIC

Delegates to the 1992 United Nations Conference on Environment and Development (UNCED) recognized that the use of chemicals is essential to meet social and economic goals, but also acknowledged that a great deal remains to be done to ensure the sound management of chemicals. Chapter 19 of Agenda 21, the programme of action adopted by UNCED, contains an international strategy for action on chemical safety. Paragraph 19.38(b) calls on States to achieve by the year 2000 the full participation in and implementation of the PIC procedure, including possible mandatory applications of the voluntary procedures contained in the amended UNEP London Guidelines for chemicals and the FAO International Code of Conduct for pesticides.

In November 1994, the 107th meeting of the FAO Council agreed that the FAO Secretariat should proceed with the preparation of a draft PIC Convention as part of the FAO/UNEP Programme on PIC in cooperation with other international and non-governmental organizations. In May 1995, the 18th session of the UNEP Governing Council adopted decision 18/12, which authorized the Executive Director to convene, together with the FAO, an Intergovernmental Negotiating Committee (INC) with a mandate

to prepare an international legally binding instrument for the application of the PIC procedure for pesticides. A diplomatic conference for the purpose of adopting and signing such an instrument was originally to be convened in 1997.

What was the Procedure Adapted to draft the PIC Convention?

Between March 1996 and March 1998, delegates met five times as an Intergovernmental Negotiating Committee (INC) to draft the Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Chemical formulation for Pesticides in International Trade (PIC convention). Participation varied from more than 194 delegates from 80 governments, the European Commission, a number of specialized agencies, IGOs and NGOs at INC-1 to over 300 delegates from 102 countries at INC-3. The INC agreed upon the text of the PIC Convention that was presented to the Diplomatic Conference in Rotterdam, in 10 -11 September 1998. It also developed a draft resolution on interim arrangements before the Convention's entry into force. At the Conference of Plenipotentiaries on the PIC Convention in Rotterdam, Ministers and senior officials from nearly 100 countries adopted the Final Act of the Conference, the PIC Convention and the resolution on interim arrangements. Sixty-one countries signed the PIC Convention, while 78 countries signed the Final Act. The Convention will remain open for signature at United Nations Headquarters from 12 September 1998 to 10 September 1999. It will enter into force 90 days after receipt of the 50th instrument of ratification.

The PIC Convention is a means for formally obtaining and disseminating information so that decisions can be made by importing countries as to whether they wish to receive future shipments of certain chemicals and for ensuring compliance with these decisions by exporting countries. The Convention promotes shared responsibility between exporting and importing countries in protecting human health and the environment from the harmful effects of such chemicals and provides for the exchange of information about potentially hazardous chemicals that may be

exported and imported. A key goal of the PIC Convention is to provide technical assistance for developing countries and countries with economies in transition to develop the infrastructure and capacity necessary to implement the provisions of the Convention. The PIC Convention will initially cover 22 pesticides and five industrial chemicals **(Annex I)**, but it is expected that many more will be added as the provisions of the Convention are implemented. Governments have agreed to continue to implement the voluntary PIC procedure during the interim period using the new procedures contained in the Convention until the Convention formally enters into force.

Overall, completion of the PIC Convention is a small but significant step towards a more comprehensive and sustainable international chemical management framework.

The PIC procedure is voluntary - it has been unanimously accepted by member countries of FAO and UNEP and is supported by the leading chemical industry associations and a variety of non-governmental organizations.

Chapter 19 of Agenda 21, the programme of action adopted by UNCED, contains an international strategy for action on chemical safety. Paragraph 19.38(b) calls on States to achieve, by the year 2000, the full participation in and implementation of the PIC procedure.

What is Prior Informed Consent (PIC)?

PIC is a procedure that:

- helps participating countries learn more about the characteristics of potentially hazardous chemicals that may be shipped to them,
- initiates a decision making process on the future import of these chemicals by the countries themselves and
- facilitates the dissemination of this decision to other countries.

The PIC procedure is a means for formally obtaining and disseminating the decisions of importing countries as to whether they wish to receive future shipments of such chemicals. The aim is to promote a shared responsibility between exporting and importing countries in protecting human health and the environment from the harmful effects of certain hazardous chemicals being traded internationally. PIC is not a recommendation to ban or severely restrict the use of chemicals.

What is the important Definition for the purpose of PIC Convention?

1. **Chemicals:** Substances whether by itself or in a mixture or preparation. It consists of the following categories: pesticide (including severely hazardous pesticide formulations.
2. **Banned chemicals:** Chemicals all uses of which has been prohibited by final regulatory action, in order to protect human health or the environment.
3. **Severely restricted chemicals:** Chemicals virtually all use has been prohibited by final regulatory action in order to protect human health or environment, but for which certain specific uses remain allowed.
4. **Severely hazardous pesticide formulation:** Chemical formulated for pesticidal use that produces severe health or environmental effects observable within a short period of time after single or multiple exposures, under conditions of use.
5. **Final regulatory action:** Action taken is a party that does not require subsequent regulatory action that party, the purpose of which is to ban or severely restrict a chemical.
6. **Regional economic integration organization:** Organization constituted by sovergin states of a given region to which its member has transfeered competence in respect of matters governed by this convention and which has been duly authorised, in accordance with its internal procedures, to sign, ratify, accept, approve or accede to this convention.

Who runs PIC?

The Prior Informed Consent procedure is being implemented jointly by FAO and UNEP through the FAO/UNEP Joint Programme on Implementation of PIC. The Plant Production and Protection Division of FAO is the lead agency for pesticides and **UNEP** Chemicals **(IRPTC)**, is lead agency for other chemicals. A Joint Group of Experts on PIC has been established to provide guidance and advice to the **FAO/UNEP** Secretariat on the development and implementation of the PIC procedure.

Designated National Authority

According to Article 4, each participating country needs to nominate a Designated National Authority **(DNA)** with sufficient resources to perform its function efficiently as required by the convention. The DNA acts as a focal point for the operation of the PIC procedure. The need to designate one or more authorities is dependent upon the administrative and legislative organization in each country.

Some countries have nominated one authority for all chemicals while others have designated two, one with responsibility for pesticides and a second for other chemicals. The DNA is generally a governing department or office responsible for broad policy decisions with the authority to decide which chemicals may be used in the country. In the case of pesticides, the registration authority or equivalent is generally nominated to serve as the DNA.

Which type of chemicals can be included in the PIC procedure?

Industrial and consumer chemicals that have been banned or severely restricted for health or environmental reasons by the participating governments can be included in the PIC procedure. In addition severely toxic pesticide formulations, which present a hazard under the conditions of use in developing countries, may also be included.

Certain specific groups of chemicals such as pharmaceuticals, radioactive materials are excluded from the PIC procedure. For chemicals used in food additives the FAO -Codex Allimantarious Committee has developed a comprehensive system for the exchange of information between exporter and importers.

Other specific group of hazardous chemicals used in Chemical Weapons and their precursors, and hazardous wastes are also excluded from the PIC procedure recommended by the Convention. Chemical Weapons and its precursors are covered by "Chemical Weapon (CW) Convention" and Hazardous Wastes by "Basel Convention " of 1989.

There is also exclusion for small quantities of hazardous chemicals used for research purposes and small quantity for his or her own personal use.

How are chemicals identified for inclusion in PIC?

Article 5 provides the methodology for inclusion for banned or severely restricted chemicals in the **ANNEX III " Chemicals Subject to the Prior Informed Consent Procedure".**

Country that has adapted the final regulatory action provides information to the Secretariat on control actions to ban or severely restrict chemicals through completion of a Notification of Control Action form. However, the party who has already submitted notification of final regulatory action under the Amended London Guideline for hazardous chemicals or the FAO International Code of Conduct for Pesticides" need not to re-submit those notification.

The secretariat after verification of information forward to all parties the summery of information received. The validated control actions are entered in a database maintained by the Secretariat. The secretariat forwards the information along with the information collected by it to the Chemical Review Committee. The Chemical Review Committee after reviewing the information as per the criteria setout recommends to the conference whether the chemical in

question should be made subject to the PIC procedure and accordingly listed in the List of chemical subject to the PIC procedure.

Procedure for severely hazardous pesticides formulation

Article 6 provides the procedure for inclusion of severely hazardous pesticide formulation in the list of PIC procedure. When a country experiences problem with pesticide formulation under condition of use in its territory may propose with required information to the secretariat the listing of such pesticide in the list of PIC procedure. It is the responsibility of the secretariat to forward such proposal along with submitted information and information collected by the secretariat independently to the Chemical Review Committee (CRC). It is the duty of the CRC to review all the information submitted by the secretariat and recommend to the conference of the parties whether the proposed chemical formulation for pesticide should be made subject to PIC procedure by including it in the list of chemicals for PIC procedure.

It is recognized that these criteria would not necessarily identify those pesticides to be included in the PIC procedure, which present a hazard under the conditions of use in developing countries or country with its economy in transition. These are generally acutely toxic pesticides in WHO Recommended Classification of Pesticides by Hazard, Class 1a (extremely hazardous), with typical chemical formulations, which also fall into WHO Class 1a. It has been agreed that such chemical formulations for pesticides should be included in the PIC procedure where there is evidence of serious risk to human health.

What is the Modus Operandi of PIC?

Article 10 deals with the obligation of a party of convention in relation to import or export chemicals listed under PIC procedure. For each chemical subject to the PIC procedure a Decision Guidance Document (DGD) is developed and circulated to DNAs. The DGD is intended to help governments assess the risks connected with the handling and use of the chemical and to make

more informed decisions about future import and use. It is essential that government must take into account of all aspects of local condition. The information contained in the DGD is by no means exhaustive. It is essential that DNAs use the DGDs as a basis for informed decision-making, seeking further advice if necessary and consulting other national interests, rather than simply prohibiting import of PIC chemicals without considering the consequences under their particular conditions of use.

Importing Country

The DNA prepares an Importing Country Response (ICR) form and forwards it to the FAO/UNEP Secretariat. In completing the Importing Country Response (ICR) form, countries decide whether to accept import, refuse import or allow import under certain conditions. It is also possible to make an interim decision regarding import with a request for additional time, technical assistance, or further information. The FAO/UNEP Secretariat summarizes these import decisions and a compilation of importing country responses is distributed to DNAs every six months.

It is the responsibility of the importing country to ensure that national import control authorities (customs departments), importers and, as far as possible, users are informed on a regular basis of all notifications and responses received under the PIC procedure.

A country that takes a decision not to consent to import of a chemical or consent to import under specific condition, shall be restricted to

- import of the chemical from any source
- domestic production for domestic use.

Exporting Countries

Exporting countries should ensure that PIC decisions made by participating importing countries are immediately communicated to their exporters, industry and any other relevant authorities, such as the Department of Customs. Exporting countries are also obliged

to take appropriate measures, within their authority and legislative competence, to ensure that exports do not occur contrary to the decision of participating importing countries.

If a banned or severely restricted chemical by a party is exported from its territory, it is the responsibility of the exporting party to provide an export notification to the importing party. The notification shall contain:

- Detail information on chemical,
- DNA responsible in both country;
- Precautionary measures to reduce the exposure and
- Chemical category and its for-seen use.

Amongst other things, it is the binding on the exporting country not to export from its territory to any importing party that failed to transmit a response or transmitted conditional response. However, the export may proceed:

- if the chemical under question is registered as a chemical in the importing country
- evidence shows that it has been previous use as chemical
- there is no regulatory action to prohibit its use in the importing country
- if there have been previous shipments to that country or if the chemical is approved in that country and the regulatory situation has not changed.

The obligation of party to provide notification to importing party cease when:

- Chemical has been listed in the list require PIC procedure,

- The importing party has provided Import Country Response (ICR) form to the secretariat for the import of chemical.

What are the Provision at National and Sub - Regional Level for Hazardous Chemical and Chemical Formulation for Pesticides?

National Level

Chemicals: The country has no well defined Act and Regulation to regulate the import and purchase of hazardous chemicals. Under the .....Act provision has been made to get the permission of the office of the Home Ministry for the importation of the chemicals of certain category. The group of chemical comprises strong acids, anhydrides, cyanides, pyridines, organic solvents etc. and requires permission of the Office the Home Ministry to import. Free import of these chemicals is controlled, not because of its damaging effect on human health and environment but because of security reason alone

Pesticides: Nepal Malaria Eradication Programmme (NMEP) introduced first pesticide in Nepal in the 1950s for Malaria Control. It was mostly supplied by USAID. It was only in 1960s the Department of Agriculture; HMG/Nepal initiated the application of chemical pesticides for crop protection. The consumption of pesticides for plant protection, seeds and stored products has steadily increased since then. Annually country imports over US $ 1.5 million worth pesticides annually. Main authorized importer of pesticides, with its branches all over the country is the Agricultural Input Corporation (AIC). Increasing demand for chemical pesticides resulted in the setting-up of sales and distribution dealers as private enterprises, particularly in big towns. In 1977, the Nepal Pesticides and Chemical Industries Pvt. Ltd. (NEPCIL) was established in Bahadurgunj to supply BHC dust, *Malathion* (50 percent), *Nepcil* Parathion, *Cephos* etc. locally[2].

The local representatives of foreign manufacturers in India such as BASF (Germany), ICI (Britain), Ciba-Geigy (Switzerland) are the main suppliers of pesticides in Nepal.

[2] A Study on Pesticide Pollution in Nepal, IUCN - The World Conservation Union, 1994

Before 1991, there was no law regarding the control on quality, quantity and distribution of pesticides in Nepal. Therefor, reports on imports, marketing, distribution and use of pesticides in Nepal are inadequate. Quantities of pesticides to be procured by AIC used to be estimated using the projection techniques similar to seeds and fertilizers.

Nepal is a member of the FAO Regional Project GCP/INT/457/ JPN: implementation of "International Code of Conduct on the Distribution and Use of Pesticides".
As compliance to the aim of the FAO Code of Conduct, HMG has gazated the Pesticide Act 2048 and Pesticide Regulation, 2050 to regulate the import, distribution, formulation and use of chemical formulation for pesticidal use in the country.

The Article 3 of the Act deals with the establishment of a Pesticide Committee, whose functions and duties include the formulation of national policy for pesticide, coordination between private and government sectors in the production and distribution of pesticides, and to set quality control standards.

The Article 7 deals with the establishment of the Pesticide Registration Office. The Pesticide Registration Officer of the Registration Office is given the task of formulating the process of implementing the Pesticide Regulation 2050. It is the responsibility of the pesticide registration office to prepare the list of chemical pesticide to be imported and submit to the Pesticide Committee for approval and gazetting. Only these listed chemical pesticide are allowed to be legally imported, exported, produced and distributed in the country. As per the Article 11 of the Act, no one is allowed to import any pesticide not registered in the Act.

Although the Nepal is the member of the Regional Project of FAO on "International Code of Conduct on the Distribution and Use of Pesticides" the prohibited pesticides as Chloradane, Lindane, Parathion Methyl, Phosphamidon, Mercury compounds etc. requiring PIC procedure, are freely available and used in

the country. Bihar Mineral Industries, Krishi Rasayan Bihar and other Multinational Companies in India manufacture these pesticides.

In 1997, the working group of the Workshop on "Implementation of the Pesticides Regulatory Framework ADB TA No. 2808-NEP" recommended:

- FAO guidelines should be followed for import of pesticides
- Ban on import of WHO class Ia and Ib hazardous pesticides.

Sub-Regional Level

At Sub-Regional level regarding the control of hazardous chemicals and pesticides the situation is not different from one country to another. The control over availability and use of the hazardous chemicals is due to security reason alone. Very little attention is paid on damaging effect of these chemicals on the human health and environment. Country of the sub-region like India, Pakistan, and Bangladesh has their own multinational Pesticides and hazardous chemical or its precursor manufacturing industries.

In order to protect human health and environment at the national as well as regional level from the uncontrolled purchase, formulation, use and disposal of hazardous chemicals and pesticides a regional coordination and cooperation is essential. The first step in this direction should be:

1. the ratification and implementation of the convention as sub-regional economic integration organisation,
2. uniform decision on sub-regional basis on the consent to import pesticides and chemicals is essential. The difference in consent given to different chemicals or pesticides by different countries of the sub-region (ANNEX II) shows the lack of cooperation and understanding. Especially for countries of the region, except Sri Lanka and Maldieves, due to poros nature of border it will be difficult to control the use of pestices/chemicals for which country has not given the consent to import.

3. take measures to adapt and implement as may be necessary at the sub-regional level to establish and strengthen national infrastructure and institutions of the member states for effective implementation of this convention for the protection of human health and environment of the region.
4. Develop a procedure to exchange of scientific, technical, economic and legal information concerning the chemicals within the scope of this convention. Such cooperation should include information on toxicology, eco-toxicology and safety.
5. Cooperate in promoting technical assistance for the development of the infrastructure and the capacity necessary to manage chemicals to enable implementation of this convention.

What are the other International Conventions Where PIC Procedure is Included?

Basel Convention (March, 1989)

The Basel Convention "On the Control of Trans-boundary Movements of Hazardous Waste" was adopted in March 1989 after a series of toxic cargoes from industrialized countries provoked world outrage when they were dumped in developing nations. The Basel Convention places on exporting and importing states a shared responsibility for environmentally sound management and disposal of such waste. While affirming the sovereign right of any state to prohibit import"

The Article 4 of the convention prohibits export of hazardous waste to any state without its Prior Consent in writing to specific import.

Convention on Biological Diversity (1992)

According to paragraph five of Article 15, access to genetic resources is also subject to the prior informed consent (PIC) of the Party providing the genetic resources. This means that prior to a potential user gaining access to genetic resources under the jurisdiction of the State, it must obtain the consent of the government.

Prior informed consent in this case may be described as:

1. Consent of the Contracting Party, which is the genetic resource provider.
2. Based on information provided by the potential genetic resource user,
3. prior to consent for access granted

Contrary to PIC convention and Basel convention, Biological diversity convention does not require restriction on the use of genetic resources per se. Instead, it merely affirms that a government has authority to determine access

Conclusion

The Prior Informed Consent Convention is a dynamic and flexible global agreement on management of hazardous chemicals and pesticides with an inbuilt capacity for further development. It is a unique forum where governments of the world discuss and negotiate and develop solutions to the problem related to the management of hazardous chemicals threatening human life and environment.

The Prior Informed Consent Convention is meant to establish a global regulatory regime for the environmentally sound management of hazardous chemicals and pesticides. The uniqueness of this instrument is:

- obligation of the parties to the PIC convention not to export to or import listed hazardous chemicals and severely hazardous pesticide formulation for which Prior Informed Consent procedure is necessary, from non-parties to the convention;
- the exchange of scientific, technical, economic and legal information concerning the chemicals included in the scope of this convention and availability of such information to the public;
- cooperation and assistance in promoting technical assistance for the development of the infrastructure and the capacity necessary to manage chemicals to enable implementation of this convention.

Annex - I

Chemicals Subject to the Prior Informed Consent Procedure

S.N.	Chemical	Category
1.	2,4,5-T	Pesticide
2.	Aldrin	Pesticide
3	Catafol	Pesticide
4	Chlordane	Pesticide
5	Chlordimeform	Pesticide
6	Chlorbenzilate	Pesticide
7	DDT	Pesticide
8	Dieldrin	Pesticide
9	Dinoseb and dinoseb salts	Pesticide
10	1,2- dibromoethane (EDB)	Pesticide
11	Fluroroacetamide	Pesticide
12	HCH (mixed isomers)	Pesticide
13	Heptachlor	Pesticide
14	Hexachlorobenzene	Pesticide
15	Lindane	Pesticide
16	Mercury compounds, including inorganic mercury compounds, alkyl mercury compounds and alkyloxyalkyl and aryl mercury compounds	Pesticide
17	Pentachlorophenol	Pesticide
18	Monocrotophos (soluble liquid formul-ations of the substance that exceed 600g active ingredient/l)	Severely hazardous pesticide formulation
19	Methamidophos (soluble liquid formulations of the substance that exceed 600 g active ingredient/l)	Severely hazardous pesticide formulation
20	Phosphamidon (soluble liquid formulations of the substance that exceed 1000 g active ingredient/l)	Severely hazardous pesticide formulation
21	Methyl-Parathion	Severely hazardous pesticide formulation
22	Parathion	Severely hazardous pesticide formulation
23	Crocidolite	Industrial
24	Polybrominated biphenyl's (PBB)	Industrial
25	Polychlorinated biphenyl's (PCB)	Industrial
26	Tris (2,3-dibromopropyl) phosphate	Industrial

Annex - II

Sub-Regional Level Importing Country Response submitted Previously under Procedure of Prior Informed Consent.

S.N.	CHEMICALS / PESTICIDES	IMPORT DECISION						
		Bangla desh	Bhutan	India	Maldives	Nepal	Pakistan	Sri Lanka
1.	Aldrin	NC	NC	NC	*THERE ARE NO IMPORT DECISION FROM THIS COUNTRY*	C	NC	C
2	Chlordane	C	-	NC		NC	NC	C
3	Chlordimeform	C	-	NC		NC	-	NC
4	DDT	NC	C	C		C	NC	NC
5	Dieldrin	C	NC	C		C	NC	C
6	Dinoseb & Dinoseb Salts	-	NC	C		NC	-	NC
7	EDB (1,2 dibromoethane)	-	-	C		NC	NC	NC
8	Fluoroacetamide	-	NC	NC		NC	NC	NC
9	HCH (Mixed isomer)	-	C	C		C	NC	NC
10	Heptachlor	NC	-	NC		NC	C	NC
11	Mercury Compound	-	-	-		NC	NC	NC
12	2,4,5,T	-	-	NC			NC	-
13	Captfol	-	-	C			NC	-
14	Chlorobenzilate	-	-	C			NC	-
15	Crocidolite	-	-	C			-	-
16	Hexachlorobenzene	-	-	NC			-	-
17	Lindane	-	-	C			NC	-
18	Pentachlorophenol	-	-	NC			NC	-
19	Polybrominated Biphenyls (PBB)	-	-	C			-	-
20	Poly Chlorinated Biphenyls (PCB)	-	-	C			-	-
21	Poly Chlorinated Tri-phenyls (PCT)	-	-	C			-	-
22	Tris (2,3,dibromopropyl) phosphate	-	-	C			-	-
23	Hexachlorobenzene	-	-	-			NC	-
24	Methamidophos	-	-	-			NC	-
25	Methyl Parathinion	-	-	-			NC	-
26	Monocrotophus	-	-	-			NC	-
27	Parathion	-	-	-			NC	-
28	Phosphamidon	-	-	-			NC	-

LEGEND : **C : CONSENT**
NC : NO CONSENT

Annex - III

Designated National Authority to PIC Procedure

Bangladesh
CP

The Director General
Department of Environment
House No. 2, Road No. 16
Dhanmondi R/A
Dhaka-1206

BHUTAN
C:

The Honourable Minister
Ministry of Trade and Industries
Thimpu

P:
The Secretary
Ministry of Agriculture
Thimphu
tel: 2129/2168
tlx: 211 MAGFOTPU BT

INDIA

C:

Joint Secretary
Department of Chemicals and Petrochemicals
Ministry of Chemicals and Fertilizers
Shastri Bhavan
Rajendra Prashad Road
New Delhi, India
Tel: 91 11 3385131
Fax: 91 11 3382176

P:

The DirectTor/Deputy Secretary
Plant Protection Division
Department of Agriculture & Co-operation
Room No. 224-A
Krishi Bhuvan, New Delhi

MALDEIVES

There are no PIC import Decisions from this country.

NEPAL

CP:
Chief
Plant Protection and Industrial Entomology Division
Department of Agriculture Development
Ministry of Agriculture
Harihar Bhavan
Lalitpur
Nepal

PAKISTAN

CP:
Director General
Ministry of Environment, Urban Affairs, Forestry and Wildlife
U.B.L Building, 7th Floor
Jinnah Avenue, Blue Area
4400 Islamabad

SHRI LANKA

C:

The Director General
Central Environment Authority
Maligawatte.

P:

Registrar of Pesticides
Pesticides Registration Office
P.O. Box 49
Getambe, Peradeniya

LEGEND: C: CHEMICALS
P: PESTICIDES

Annexes

Annex - 1

Biodiversity Conservation-friendly Policies

Plan	Major Policy Concepts
First Plan (1956-61)	Develop a policy for the conservation and sustainable utilization of forest resources
Second Plan (1962-65)	Approach to long-term development of forestry resources, and allocate hill forests to local body for management
Third Plan (1965-70)	Emphasize wildlife conservation, conduct survey for economically valuable plants
Fourth Plan (1971-75)	Manage and develop forests scientifically, strengthen wildlife conservation activities
Fifth Plan (1976-80)	Implement forestry working plans, promote existing PAs and establish new ones, conserve forests and rare wildlife, initiate commercial farming of medicinal plants
Sixth Plan (1981-85)	Enhance community participation in forest management, emphasize wildlife conservation and establish national parks, introduce tourism for economic benefits
Seventh Plan (1986-90)	Enhance people's participation in forest and natural resources conservation, expand commercial farming of medicinal plants
Eighth Plan (1992-97)	Develop PAs for ensuring biodiversity conservation and promotion of natural sites, involve people and communities in forest development and management, formulate practical rules for the utilization of forest products, establish a trust fund for benefit sharing accrued from PAs. Emphasize diversification and commercialization of agriculture and industrial crops.
Ninth Plan (1997-2002)	Adopt measures for attaining self-sufficiency in PAs (utilize revenue for conservation), expand PAs for biodiversity conservation considering representation of ecological zones, ensure people's participation in buffer zone management and introduce income generating activities, implement ecosystem-based biodiversity conservation activities and promote eco-tourism, develop appropriate technologies for the conservation, and farming of endangered plant species, particularly the medicinal plants; provide training on commercial farming of medicinal plants for employment and income generation.

National Plan/ Strategy	
National Forestry Plan, 1976	Obtain maximum contribution from forests by preserving wildlife, forest and vegetation, establish parks and reserves for wildlife protection, including natural vegetation, save threatened wildlife species from extinction, regulate hunting of wildlife species other than protected ones, and undertake research and publicity on educational, scientific and cultural values of wildlife.
NCS, 1933 (Prospectus)	Develop seed bank, promote zoos, conserve agriculture diversity, protect endangered and endemic plants and animals
NCS for Nepal, 1988	Adopt principles of wise-use, protection, preservation and restoration of biodiversity, ensure strict protection of Churiya and Bhabar forests, protect areas containing essential habitats of mammals, migratory birds or fresh-water fish, promulgate rules for the management and harvesting of medicinal plants and minor forest products, assess genetic resources of livestock, introduce EAs, etc.
MPFS 1989	Ensure forest management with people's participation, conserve ecosystems and genetic resources
NEPAP, 1993	Strengthen institutional capacity, ensure ecosystem management, involve local people in PAs management, promote private and public institutions for biodiversity inventory and conservation
Agriculture Perspective Plan	Focus in-country research on cereals, cash crops and conservation of genetic diversity of agriculture crops and livestock.
Environmental Guidelines	Consider biodiversity conservation while preparing and approving EA reports. National EIA Guidelines, 1993, EIA Guidelines for Forestry and Industry Sector, 1995 favor for assessing impacts on species

Note: PAS = protected areas (national parks, wildlife reserves, hunting reserves and conservation areas etc.)

Annex - 2

Legal Measures for the Conservation of Biological Diversity

Acts and Orders	Articles and Provisions
Aquatic Life Protection Act, 1961,	3. Punish a person involved in using poisonous, noxious or explosive materials into water bodies with intent to catch or kill aquatic life. 4. Prohibit catching, killing, and harming aquatic animals by notification in the Nepal Gazette. 5. Construct fish ladder to ensure movement of aquatic life, if fish ladder is not possible, establish hatchery or nursery for artificial breeding.
Plant Protection Act, 1972	3. Regulate export or import of plants or plant products, establish check points and quarantine offices, and prohibit import of bacteria, microbes, spiders or snail and their transmission.
National Parks and Wildlife Conservation Act, 1973	3. Declare protected areas and buffer zones5. Prohibit actions related to hunting, extraction of forest and forest products, damage to forests and wildlife 10. Prohibit hunting of legally protected wildlife (as included in Schedule 1) 15. Obtain permit to collect samples of biological species 25. Offer rewards to informer who informs of possession of wildlife products of protected species; allocate 30 to 50 percent of the total revenue generated in PAs for community development 26. Punish person(s) involved in killing, selling, buying products of protected wildlife.
Soil and Watershed Conservation Act, 1982	3. Declare a protected watershed area 10. Prohibit damage to natural vegetation, and discharge or disposal of wastes in declared watersheds.
King Mahendra Trust for Nature Conservation Act, 1982	9. Implement activities for the conservation, promotion and management of wildlife and other natural resources, and conduct scientific study and research on wildlife.

Forest Act, 1993	23. Declare a part of national forest as protected forest having environmental, scientific or cultural importance or of any other special importance. 30. Utilize at least 25 percent of the total income generated in the community forest for the development, conservation and management of community forest 49. Prohibit actions, inter alia, related to deforestation, ploughing or cultivation, fire, cutting or damaging trees or vegetation, and hunting in national forests 68. Use any parts of all types of forests for implementing national priority projects, if it does not adversely affect the environment 70. Prohibit collection, felling, utilization, transportation, sale or export of forest products from prescribed forests for the conservation of biodiversity and environment.
Environment Protection Act, 1996	10. Maintain an environment conservation area in any place containing ... rare wildlife, biodiversity, plant...
Shivapuri Watershed and Wildlife Reserve Development Board (Formation) Order, 1984	4.1 Conserve Shivapuri watershed and wildlife reserve, and promote conservation of water sources, and develop it a recreational area.
Central Zoo Development Board Order, 1989	3.1 Develop zoo for the demonstration and conservation of endangered birds and wildlife, and carry out research on birds and wildlife

Source: various legislation

Annex - 3

Summary of Institutional Mandate and Working Areas on Biodiversity Conservation

Institutions	Major Working Areas
Ministry of Forest and Soil Conservation	Policy, planning and monitoring related to species conservation and utilization
Department of National Parks and Wildlife Conservation	Program implementation in national parks and wildlife reserves, coordination on research activities in specified areas, scientific authority for wild animals
Department of Forest	Responsible for the scientific management and conservation of forest areas and utilization of forest products outside PAs
Department of Plant Resources	Responsible for exploration, identification, scientific research, development of bio-technologies, and *in situ* and *ex situ* conservation of endangered, threatened, rare and endemic plant species and scientific authority for plant resources and housing of plant specimen
Department of Soil Conservation	Conservation of flora and fauna and habitat improvement in watershed
Department of Forest Research and Survey	Research and development of agro-forestry technology and silvicultural methods for forest management, and forest inventory.
Ministry of Agriculture	Mandated for crop research and survey, propagation and breeding of agriculture plants, livestock, and fish, regulate export and import of plant products

Department of Agriculture	Research on hybrid plants, and production of crops, vegetables, fruits and fishes; plant genetic diversity conservation
Department of Live-stock Services	Livestock genetic resources conservation.
Ministry of Population and Environment	Focal node for national and international organizations and implementation of conventions by preparing strategy; identify and implement conservation areas.
Corporate Bodies	**Working Areas**
Central Zoo Development Board	*Ex situ* conservation of endangered wild animals, particularly the mammals and birds and breeding for increasing wildlife population.
Herb Production and Processing Company	Utilization of medicinal and aromatic plants (MAPs) and commercial farming or domestication of medicinal plants
Forest Products Development Board	Forest utilization and plantation activities
National Agriculture Research Council	Research and development on crops and horticulture plants, and livestock and fisheries, conservation and utilization of plant genetic resources and/or germplasm exploration and monitoring of genetic erosion

Education, Research & NGOs	Working Areas
Tribhuvan University	Provides higher education on basic science, and agriculture and forestry as applied sciences; three institutes offer biodiversity conservation related courses in under-graduate, graduate and post-graduate level.
Institute of Science	Offers basic science courses on plant, animal and microbial organism, and their life cycle, physiology and biodiversity conservation
Institute of Forestry	Offers courses on various aspects of forests and wildlife management
Institute of Agriculture	Conservation of genetic resources (domesticated plants and animals) and agriculture ecosystems.
Kathmandu University	Offers basic courses on plant and animal sciences and environmental biology.
Research Organization	
RONAST	Research and development for utilizing natural resources
RECAST	Monograph preparation of commercially valued species
Natural History Museum	Collection, preservation, documentation and exhibition of plant and animal species.
Local NGOs/CBOs	Program implementation and management
IUCN	Generate scientific information for species and ecosystem management
WWF	Generate funds for research, HRD, and program implementation
ANSAB	Research and awareness on sustainable use of biodiversity components
TMI	Fund generation and program implementation

Annex - 4

Selected Biodiversity Conservation Programs in NBAP

S.N.	Biodiversity Areas	Programs	Objectives
1 1.1	Agriculture	National genetic resources programs	Maintain food security by conserving agriculture biodiversity
1.2		In situ conservation of agricultural biodiversity	Promote agricultural biodiversity without loss of on-farm biodiversity
1.3		Establishment of a plant genetic resources conservation and utilization centre	Ensure that indigenous germplasm for crop improvements is available and ex situ germplasm collections are adaptive
2 2.1	Community Forestry	Biodiversity policy and baseline information	Append the biodiversity in the forest policies and incorporate into operational plan
2.2		Model for sustainable use of biodiversity	Develop a model to demonstrate sustainable use of biodiversity in the Mid hills
3 3.1	Livestock	National livestock conservation and breeding policy	Develop a legislation and institutional arrangements
3.2		Survey of livestock genetic resources	Prepare an inventory of domestic animal resources and prioritize management strategies according to their population status

3.3		Indigenous live-stock improvement	Develop a long-term management plan to increase the population and productivity of *yak*, *lulu* and *achhame* cattle
3.4		Ex *situ* conservation of indigenous livestock breeds	Establish a national data bank of indigenous breeds and implement a genetic improvement program
4 4.1	Non-Timber Forest Products	National register for plant species	Develop a policy on genetic resource access and intellectual property rights
4.2		Harvesting: key issues of collectors and users	Ensure that collectors receive an equitable share in the benefits
4.3		Marketing NTFPs on a sustained yield basis	Strengthen ban and control mechanisms of NTFPs, and encourage domestication of medicinal and other plants
4 4.1	Protected Areas	Priority habitat studies	Develop a nation-wide system of habitat monitoring and adopt ecosystem approaches
4.2		Priority species assemblage studies	Determine existing assemblage of fauna with PAs
4.3		Priority species conservation	Long-term conservation of endangered or threatened mammals
5.1	Rangeland	National rangeland policy	Develop a national rangeland policy

5.2		Conservation of rangeland biodiversity	Protect and conserve rangeland biodiversity through baseline information, training, education and awareness building
6 6.1	Special Areas	Conservation of unprotected forest with high biodiversity	Implement conservation measures to protect biodiversity in High Mountains, Mid-Hills and Mahabharat Range
6.2	Wetland	Addressing intellectual property rights	Develop national visions and strategic directions for addressing intellectual property rights
6.3		Natural resource accounting and evaluation of biodiversity	Develop a national accounting system and promote sustainable use and evaluation of biodiversity
7 7.1		National wetland policy	Develop a national wetland policy to safeguard wetland biodiversity
7.2		Wetland priority actions on critical sites	Address conservation issues to maintain critical wetland sites and Ramsar Site
7.3		Understanding ecological aspects of wetlands and human activities relating to wetlands through integrated management planning	Implement integrated management plan by understanding ecological processes and human activities

Source: Draft National Biodiversity Action Plan (unpublished). May 1998.