REGIONAL ENVIRONMENTAL & NATURAL RESOURCES INFORMATION CENTRE

ADB ASSISTED PROJECT

REPORT

OF

WORKSHOP 1

HELD AT AGRARIAN RESEARCH AND TRAINING INSTITUTE

COLOMBO, SRI LANKA

21ST - 23RD FEBRUARY 1991

SOUTH ASIA CO-OPERATIVE ENVIRONMENT PROGRAMME

NO. 84, LORENSZ ROAD

COLOMBO 4

SRI LANKA

REGIONAL ENVIRONMENTAL & NATURAL RESOURCES INFORMATION CENTRE

REPORT OF

RENRIC WORKSHOP I

FEBRUARY 1991

SOUTH ASIA CO-OPERATIVE ENVIRONMENT PROGRAMME

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REGIONAL ENVIRONMENTAL AND NATURAL RESOURCES INFORMATION CENTRE
RENRIC WORKSHOP I
21 - 23 February 1991
Colombo - Sri Lanka

REPORT

1. INTRODUCTION

The first workshop of the Regional Environmental and Natural Resources Information Centre was held in Colombo Sri Lanka on the 21st, 22nd and 23rd February 1991.

2. ATTENDANCE

The RENRIC Workshop I was attended by Representatives from the following Member Countries viz. Bangladesh, Bhutan, India, Pakistan, and Sri Lanka.

Representatives from the following organisations also participated. Asian Development Bank (ADB), United Nations Environment Programme (UNEP), South Asia Co-operative Environment Programme (SACEP), National Energy Environmental Research Laboratory (NEERL), Hawaai, World Food Programme (WFP), Central Environmental Authority (CEA), Sri Lanka, National Aquatic Resources Agency (NARA), Sri Lanka, Ministry of Lands Irrigation and Mahaweli Development, Sri Lanka, Post Graduate Institute of Management, University of Sri Jayawardenapura, Sri Lanka, Institute of Engineers, Sri Lanka, University of Colombo, Sri Lanka, Agrarian Research and Training Institute of Sri Lanka, National Engineering Research Development Centre (NERD) Sri Lanka, and Sri Lanka Environment Congress.

A list of participant is at Annex 1.

In the work plan of the Inception report, a Workshop was scheduled for the end of the Project period viz in June 1991. However, after the commencement of the Project it was felt that the Focal Points had to be sensitized about the objectives of the RENRIC project in order to get their fullest involvement in the project. In consultation with the Asian Development Bank, a Workshop was organised in mid-term (February 1991) with the twin objectives of briefing the Focal Point members of their obligations to the RENRIC, and to elicit their views regarding inputs desired by them from RENRIC & contributions to be made in return. This report therefore forms a useful document for the mid term review of this project in accordance with the progress report of the Project (Annex V).

3. INAUGURATION

The inaugural session was held at the Agrarian Research and Training Institute on 21st February 1991. Given below is the Agenda of the Inaugural Session.

Lighting of the Traditional Oil Lamp
Welcome Address by Mr. G F Farrukh - Chairman, SACEP Consultative Committee
Address by the ADB Representative, Mr. Ali M Azimi
Address by the UNEP Representative, Dr. M R Amini
Keynote Address by the Minister of Environment and Parliamentary Affairs, Hon. Vincent Perera
Vote of Thanks by Mr. A M S Hoque Director, SACEP

Please see Annex II for extracts of their statements.

4. ELECTION OF OFFICE BEARERS

The following office bearers were elected for the sessions.

Chairman -	Mr. Harjit Singh, India
Vice Chairman -	Mr. Daw Tenzin, Bhutan
	Mr. Ashraf Zahid, Pakistan
Rapporteur -	Mr. Sanaul Hoque, Bangladesh

5. WORKSHOP SESSIONS

Commenced at 13.30 hrs on 21st February 1991 and the Work Schedule is found in Annex III.

The following country experiences were presented.

a) Dr. A N S Kulasinghe - Sri Lanka
b) Mr. Harjit Singh - India
c) Mr. Daw Tenzin - Bhutan
d) Mr. Ashraf Zahid - Pakistan
e) Mr. Sanaul Hoque - Bangladesh

Please see Annex IV for their presentations.

6. RECOMMENDED COURSE OF ACTION

The participants welcomed the initiative taken by SACEP for the formulation and implementation of the RENRIC Project with the assistance from the Asian Development Bank. The suggestions contained in the Inception Report and the need for further strengthening of the project were endorsed by the Workshop. This will enable RENRIC to meet specific information requirements of member countries and also collectively of the sub-region. Taking into account the activities of the international organisations such as UNEP, FAO etc. in the field of environmental information, it was suggested that RENRIC would work in close co-operation with these organisations and seek their assistance and co-operation whenever required so as to avoid any duplication. RENRIC would thus emerge as an effective supplementary mechanism for meeting specific information needs of SACEP countries.

Country presentations other than that of India indicated very strongly that their countries do not possess an adequate environmental information gathering and dissemination mechanism. In this context the participants felt that, RENRIC could play a very crucial role in strengthening the existing information nodes in the individual countries, and eventually create an effective network among these nodes. The role played so far by RENRIC has galvanised member countries of the need to establish an information network as it constitutes an important parameter in the activities contemplated in the areas of environment and development by the respective countries.

The participants were unanimous in their requests for RENRIC to seek assistance from various sources for the establishments of "nascent cells" in their member countries as the "germ" for a comprehensive network. Participants were of the view that if such initial "seed" funding should be found for such a unit for the acquisition of basic equipment such as a computer, printer, and possibly support for at least one professional, the countries themselves would then be able to provide the required office equipment, office space, furniture and the support staff to initiate the working of the cell. It was emphasized that the creation of the information cells at the focal points, would facilitate both the collection and dissemination of information within the country, support the RENRIC network and other networks in or outside region.

While it was felt that the hardware/software could be purchased with relative ease, the training of the professional staff could pose a problem. The Indian delgate informed that his country had adequate facilities for training purposes. Participants suggested that the Indian Regional Service Centre of INFOTERRA should be requested through INFOTERRA PAC, Nairobi to organise a training programme/workshop out of funds already allocated by UNEP.

In order that RENRIC could emerge as a viable unit for effective collection and dissemination of information, the participants were unanimously of the view that the duration of the project should be extended five years. In this context reference was made to the observation made by the Hon. Minister of Environment and Parliamentary Affairs of the Government of Sri lanka in his inaugural speech. After detailed discussion and keeping in view norms applied by international donor agencies, it was considered that assistance be sought for a minimum period of two years (that is July 1991 to June 1993). This would enable the member countries to operate these information centres on the completion of this two year period with their own resources. This will also provide the opportunity to the countries concerned to evaluate the usefulness of this exercise and to make necessary provisions in their nationl plan/budget. It was recommended that SACEP should similarly provide funds within its budget for the continuation of the project after the second phase.

The participants appreciated the efforts of RENRIC in bringing out the following monographs:

1. Database - Environmental Expertise
2. Database - Environmental Training/Research Institutions
3. Database - Environmental Legislation (Under print)

The participants commended this activity and urged that this be continued and that additional monographs be brought out on specific topics of information relevant to the countries. The participants desired that the presentation made by Dr. A N S Kulasinghe for the utilisation of renewable energy resources such as biomass, wind and solar be printed for distribution among the member countries as some of the devices were not adequately known in other countries in the region. Similarly experience of the Environmental Information System of India (ENVIS) presented by Mr. Harjit Singh was recommended by the participants for publication as a monograph, as it would provide a guideline framework for similar efforts in the member countries of SACEP.

It was considered that RENRIC should take necessary initiatives to obtain the services of consultants from resources of other international agencies for this project. It was suggested that SACEP also should be an avenue through which member countries could obtain consultancy services for the establishment of the information network and other information activities. Money could be allocated from the RENRIC project so that member countries could release experts on request by other countries within the region on the payment of a nominal honorarium. This would be a very cost effective method of obtaining pertinent expertise. It was suggested that the SACEP Newsletter be used for publishing the activities of RENRIC without initiating a separate Newsletter for this RENRIC Project.

The participants and the Director, SACEP commended the work done by the International Consultant and the Senior Consultant in getting this project implemented given the number of constraints encountered and the unavoidable problems common in the commencement of a new project. It was specifically stated by the delegates that the joint experiences both nationally and internationally of the two consultants is invaluable for further implementation of the project.

The delegates wanted to place on record their appreciation of the financial assistance given by UNEP Regional Office for Asia and Pacific in meeting part of their travel cost. Participants concluded by thanking RENRIC and SACEP for the excellent arrangements made for this Workshop and ADB for the generous support given to the SACEP countries.

This Advertisement appered in the DAILY NEWS of 21 February 1991 ... which will continue to appear periodically

INFORMATION
KEY TO DEVELOPMENT

Regional Environmental & Natural Resources Information Centre (RENRIC) is a Project funded by the Asian Development Bank in collaboration with the UNEP funded INFOTERRA sub regional centre of South Asia situated in New Delhi and in association with our data bank will attempt to answer all queries on the following subject matter areas related to the environment.

ENERGY AND TRANSPORT
TOXIC WASTE
LEGAL ASPECTS
POLLUTION CONTROL
URBANIZATION
FOREST AND WILD LIFE
COASTAL MANAGEMENT
HUMAN SETTLEMENT
AGRICULTURE
POLLUTION

OR

any other in the field of environment.

This service is rendered free of charge. Please send your queries with a self addressed stamped envelope to;

DR. LESLIE HERATH – SENIOR CONSULTANT
RENRIC PROJECT
SOUTH ASIA CO-OPERATIVE ENVIRONMENT PROGRAMME
84, LORENSZ ROAD
COLOMBO 04.
FAX 589369

If the queries have to be referred to the Infoterra Centre in New Delhi it would take approximately six weeks to get your answers.

ADB / SACEP - PROJECT

THIS IS A CLEAR INDICATION OF RENRIC'S CLOSE ASSOCIATION WITH INFOTERRA AND OTHER SUBREGIONAL NETWORKS

ANNEX I

ANNEX 1

LIST OF PARTICIPANTS

COUNTRY PARTICIPANTS

BANGLADESH

Mr. Shah Mohammed Sanaul Hoque - Assistant Secretary,
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SRI LANKA

Mr. W P W Weerawardene	-	Senior Assistant Secretary (Administration) Ministry of Environment & Parliamentary Affairs 6th Floor, Unity Plaza Building Colombo 4 Tel. No. - 588302
Mr. Sunil Sarath Perera	-	Senior Assistant Secretary (Media & Information) Ministry of Environment & Parliamentary Affairs 6th Floor, Unity Plaza Building Colombo 4 Tel. No. - 588302
Mr. K A K Jayathilake	-	Assistant Secretary Environment (Technical Field) Ministry of Environment & Parliamentary Affairs 6th Floor, Unity Plaza Building Colombo 4 Tel. No. - 588302

OTHERS

Dr. R D Deshpande	-	International Consultant RENRIC
Dr. Leslie Herath	-	Senior Consultant RENRIC
Mr. Ali M. Azimi	-	Senior Environment Specialist Asian Development Bank Manila
Dr. M R Amini		Senior Environment Officer United Nations Environment Programme Regional Office for Asia and Pacific Bangkok

Mr. P M Neil Fernando	-	Senior Consultant Post Graduate Institute of Management University of Sri Jayawardenepura
Mr. A N S Kulasinghe	-	Chairman National Engineering Research & Development Centre
Mr. D D A Danforth	-	Chief Engineer National Energy & Environmental Research Lab (NEERL) Hawaii
Ms K S Menike	-	Environmental Programme Officer Central Environmental Authority
Dr.(Mrs.) Padmini de Alwis	-	Head/Environmental Study Unit National Aquatic Resources Agency
Mr. S Medawewa	-	Director Ministry of Lands, Irrigation and Mahaweli Development
Mr. P A Dayananda	-	World Food Programme
Mr. S M K B Nandaratne	-	Research Officer Agrarian Research and Training Institute
Mr. D L O Mendis	-	Past President Institute of Engineers Sri Lanka
Mr. A R Weerasinghe	-	Instructor Institute of Computer Technology University of Colombo
Ms. E Ramya Rodrigo	-	Features Editor Sri Lanka Environment Congress

Mr. H H de Silva	-	Head/Department of Alternative Fuels National Engineering & Research Development Centre
Mr. K G Perera	-	Head/Department of Solar Energy National Engineering & Research Development Centre
Mr. M W Leelaratna	-	Principal Research Engineer National Engineering & Research Development Centre
Mr. A M S Hoque	-	Director/SACEP
Mr. P N Dias Abeygunawardene	-	Consultant/SACEP
Ms. K G R Kariyawasam	-	Analyst/Programmer RENRIC

SACEP SECRETARIAT

Ms. Marlene Pereira	-	Administrative Assistant/SACEP
Ms. Shelaan de Silva	-	Secretary/SACEP
Ms. Bushra Ismail	-	Secretary/SACEP

ANNEX II

ANNEX II

SUMMARY OF ADDRESSES AT THE INAUGURAL SESSION

WELCOME ADDRESS by Mr. G. F. Farrukh, Chairman, SACEP Consultative Committee

Mr. Farrukh in his address said that threats to the environment is a continuing menace and that remedial action is necessary at several different levels. The stress on the environment is greater in this sub-region due to significant increases in population, problems of poverty, limited economic growth and the heavy utilisation of natural resources. These factors, he said, has now led to a wide range of environmental problems such as soil degradation, desertification, air pollution, urbanisation etc. He mentioned that SACEP was established in 1981 and outlined some of the major programmes of this organisation such as South Asia Seas Programme, planting of trees, the popularisation of Environment Impact Assessment, environmental awareness programmes etc. Mr. Farrukh explained genesis of the RENRIC Project and its main functions to act as a clearing house of information. He hoped that this Workshop would evaluate the experience of this Project so far and make a necessary improvement on this basis.

ADDRESS BY DR. M R AMINI, UNEP REPRESENTATIVE

While thanking the organisers for inviting him to participate in the Workshop Dr. Amini pointed out that UNEP was instrumental in the creation of SACEP and has since its inception taken keen interest in its activities. It has also extended modest financial support from time to time. He emphasized that the SACEP countries must mobilise financial resources from their Governments so that SACEP can play an effective role and discharge functions assigned to it by member countries. he also stated that UNEP was not a financing body and can play only a catalytic role. Referring to the INFOTERRA programme of UNEP he stated that RENRIC should closely co-operate with INFOTERRA PAC so as to avoid duplication. It was mentioned that, although UNEP was facing severe financial constraints efforts would be made to assist RENRIC/SACEP to the extent possible. He congratulated the Asian Development Bank for assisting SACEP and other countries of the region in the implementation of environmentally sound development activities. He stated that UNEP would continue to co-operate with ADB in future. Finally he conveyed to SACEP and Workshop participants the greetings of Dr. Mostafa K Tolba, Executive Director of UNEP.

ADDRESS BY ADB Representative Mr. Ali M Azimi

Mr. Azimi explained the need to use scarce natural resources most efficiently and ensure that adverse environment impact are avoided. This required effective social and economic policies for environment management, management of sector policies and ensure that linkages between poverty and environment are properly understood. In these tasks, programmes for increasing public awareness, appropriate training in different field of the environment, and broad-based programmes stemming from increasing global interdependance on environmental issues will be needed. He said that RENRIC Project should provide the required technical information and advice to member countries. Applied research is necessary to fully explore the inter linkages among poverty, population increase and other factors, with the environment. He stressed the need for a partnership between policy and research functions in the fields of science and technology to increasingly use adaptive environmentally benign technologies and halt environmental degradation. He urged environmental management is basic to development and progress. He outlined the assistance provided by ADB for environment projects (The copy of the Address is annexed).

STATEMENT MADE AT RENRIC WORKSHOP - I, 21 FEBRUARY 1991

BY ALI M. AZIMI
ASIAN DEVELOPMENT BANK

Excellency, Distinguished representative, Ladies and Gentlemen,
I am very pleased to have the opportunity to participate in the RENRIC workshop.

The Asian Development Bank understands that there is a pressing need in developing and industrializing countries alike to use increasingly scarce natural resources more efficiently.

The means of so doing will depend on a vastly improved understanding of the long-term consequences and the underlying causes of environmental degradation. Increased effort will be needed to identify appropriate social, economic, and other policy measures for sound environmental management. Tracing through the chain of causality is important but often difficult - as the example of tropical deforestation shows very clearly. Environmental strategy at developing this understanding should be a prerequisite for structural and sector policy reform. This will require training, institutional strengthening, and the transfer of technologies that can help populations to adapt to changing natural resource endowments.

The Bank is therefore very pleased to have provided assistance to SACEP for a Regional Environmental and Natural Resources Information Center (RENRIC) that will establish a clearing-house mechanism to co-ordinate and provide technical information and advice concerning environmental and natural resource topics to member countries.
Improved understanding of the links between poverty and environment remains a priority. While the poor and disadvantaged tend to suffer most from environmental degradation and while poverty is an obstacle to bringing about environmental improvement, it is difficult to generalize about the extent to which poverty is itself responsible for environmental problems. Indeed, some of the most pressing environmental problems facing the planet are those originating in the wealthy countries. Most work on analyzing the relationships between poverty and environmental degradation is needed; with special attention to the extent to which these problems are compounded by population growth. More applied research is required, however, to identify equitable environmental policies at both the national and international level.

The finite nature of the earth's natural resources and its assimilative capacity means that the Bank's efforts must be complemented and paralleled by an international effort; involving industrial countries as much as developing countries.

Not only is there a growing economic interdependence among countries, but there is a growing physical interdependence as well, as exemplified by the "global commons" issues of greenhouse warming and threats to the ozone layer. The developing countries, assisted by external agencies such as the Bank, can do much to improve the management of their environment, often in ways that are also consistent with the objective of economic growth. However, their efforts may be frustrated by policies and environmentally destructive activities beyond their control. A partnership is needed that involves not only policy reform in the industrial countries, but also efforts to improve the scientific basis for decision making such as the prediction of the local and global environmental consequences of activities as well as scientific and technical research designed to adapt to or to avoid continued environmental degradation. Such a global partnership, in which all countries play their part, is essential if enduring gains are to be achieved.

That environmental degradation in its many forms constitutes a significant threat to economic development has become evident during the past decade. Sound environmental management has been recognized as fundamental to the development process, and the Bank now emphasizes the need to achieve environmental concern as an integral part of its activities. ADB recruited its first environmental advisor in 1979 and established an environmental unit in 1982. The unit was upgraded to a division in 1989 and in September of last year established an Office of the Environment.

The Bank's 1990 lending program included 17 environment-oriented loan projects amounting to $708 million and 47 environment-oriented/environment technical assistance amounting to $19.8 million.

I believe if environmental degradation and human depreciation are to be avoided in this region, determined efforts will be required in such key areas as population growth and human resource development, food security, species and ecosystem protection, energy, industry and urban settlement. An information dissemination will play a key role and am confident that RENRIC will be a success with your efforts. Thank You.

KEYNOTE ADDRESS by Minister of Enviornment and Parliamentary Affairs, Hon Vincent Perera

The Hon. Minister in his message stated that the theme of environment and development is important for the 21st century. Referring the RENRIC Project, he stated, the need to consolidate the gains from the project and also accelerate its work to meet increasing needs and expectations. He pointed out the time consuming tasks involved in the project, problems in early phase of project implementation, the nature of work in information, and the need consequently to extend the duration of assistance to fund the project until SACEP countries could support it thereafter. The Hon. Minister said that new kinds of information should be handled by RENRIC such as information on interactive issues development and environment. In this connection he refferred to nine issue areas in the field which are due to come up for discussion at the UNCED Conference in Brazil next year, and that the regional position in this regard had been already examined at the Conference of Environment Ministers of the ESCAP Region in October last year. The Hon. Minister emphasized that RENRIC should give equal attention to ready retrieval, availability and use of information and the needs of hardware, software, user linkage network services and other factors, to discharge these tasks. He urged delegates to ensure with their own governments that suitable working arrangement be made for closer collaboration between SAARC and SACEP, as already evident in two other sub-regional areas. It could be best if follow up action on environmental matters discussed and decided at the last SAARC Heads of STATEs Meeting held in Male be discharged by SACEP, inorder to ensure co-ordinated action and to prevent any duplication of efforts (The copy of his address is annexed).

ADDRESS OF THE HON. MINISTER OF ENVIRONMENT AND PARLIAMENTARY AFFAIRS

YOUR EXCELLENCIES AND DISTINGUISHED DELEGATES, THIS IS INDEED A SIGNIFICANT DAY FOR ALL OF US IN THE SOUTH ASIA REGION. WE ARE ALL AWARE THAT THE THEME OF DEVELOPMENT AND ENVIRONMENT IS NOW FAST ASSUMING A CENTRAL POSITION ON THE AGENDA OF GLOBAL AND REGIONAL ISSUES FOR THE 21ST CENTURY. IF SO, AND AS WE ARE ALREADY IN THIS DECADE OF GLOBAL INFORMATION AND COMMUNICATIONS, THIS WORKSHOP & ITS THEME ASSUMES CONSIDERABLE IMPORTANCE WITHIN THIS PARTICULAR CONTEXT.

ON THIS OCCASION, I WISH TO CONGRATULATE THE SOUTH ASIA CO-OPERATIVE ENVIRONMENT PROGRAMME FOR LAUNCHING THIS PROJECT TO SET UP THIS CENTRE FOR INFORMATION ON REGIONAL ENVIRONMENTAL AND NATURAL RESOURCES. WE ARE ALL HERE TOGETHER TO FIND WAYS AND MEANS OF CONSOLIDATING WHAT WE HAVE DONE SO FAR IN THIS PROJECT, BUT, MORE IMPORTANTLY TO MOBILISE OUR CO-OPERATIVE EFFORTS TO ACCELERATE THE WORK TO BE DONE ON THIS PROJECT TO MATCH OUR INCREASING NEEDS AND ASPIRATIONS.

THE RENRIC PROJECT IS INTENDED TO FUNCTION AS THE NATURAL RESOURCES CLEARING-HOUSE UNIT WITHIN THE SACEP INFORMATION NETWORK, USING THE FOCAL POINTS IN EACH OF OUR COUNTRIES. AS EACH OF THESE FOCAL POINTS HAS AN ASSIGNED SUBJECT MATTER AREA, SUCH INFORMATION IS INITIALLY INTENDED TO BE TRANSMITTED TO THIS CENTRE. THIS IS HOWEVER A TIME CONSUMING TASK. I AM AWARE THAT THERE HAVE BEEN SEVERAL OPERATIONAL PROBLEMS WHICH IS A COMMON FEATURE IN EARLY PHASES OF PROJECT IMPLEMENTATION. IN VIEW OF THIS AND THE VERY NATURE OF THIS PROJECT THE DURATION OF THIS PROJECT HAS TO BE EXTENDED IN ORDER TO GET ANY MEANINGFUL RESULTS. I HAVE NO DOUBT THAT IF ASSISTANCE COULD BE GRANTED TO CONTINUE THIS PROJECT FOR A REASONABLE LENGTH OF TIME, THE SACEP COUNTRIES WOULD ADOPT IT AS ONE OF ITS CONTINUING FUNCTIONS. THIS I THINK SHOULD BE THE LONG TERM OBJECTIVE OF DONORS OF THIS PROJECT.

ALSO NEW KINDS OF INFORMATION SHOULD BE OF USE. THE ESTABLISHMENT OF THE SPECIAL UNIT FOR INFORMATION SHOULD ENABLE SACEP TO EXTEND ITS HORIZONS AND NETWORK TO CAPTURE AND MAKE AVAILABLE TO US SPECIALLY, INFORMATION ON THE INTERACTIVE ISSUES OF DEVELOPMENT AND ENVIRONMENT WHICH ARE OF VITAL CONCERN TO ALL OF US.

LAST YEAR IN OCTOBER, THE MINISTERS OF ENVIRONMENT OF THE ESCAP REGION MET TO DISCUSS THE POSITION OF THE REGION IN REGARD TO THE U.N. CONFERENCE ON ENVIRONMENT AND DEVELOPMENT DUE TO BE HELD NEXT YEAR IN BRAZIL. SEVERAL MAJOR ENVIRONMENTAL ISSUES OF GLOBAL CONCERN WERE EXAMINED BY US. THE NINE ISSUE THEMES IDENTIFIED WERE :

- PROTECTION OF THE ATMOSPHERE; QUALITY AND SUPPLY OF FRESHWATER RESOURCES; THE OCEAN AND COASTAL AREA; AND LAND RESOURCES;
- CONSERVATION OF BIO-DIVERSITY AND MANAGEMENT OF BIOTECHNOLOGY;
- MANAGEMENT OF HAZARDOUS WASTES AND TOXIC CHEMICALS;
- IMPROVEMENT OF THE LIVING AND WORKING ENVIRONMENT OF THE POOR; AND
- PROTECTION OF HUMAN HEALTH AND IMPROVING THE QUALITY OF LIFE.

I WOULD REQUEST THE DELEGATES TO CONSIDER WHETHER INFORMATION ON THESE NINE ISSUE AREAS AND OTHERS OF EQUAL CONCERN SHOULD BE HANDLED BY THIS INFORMATION CENTER. I WOULD CONSIDER THIS TO BE ONE OF ITS TASKS & FUNCTIONS. I AM SURE THAT IT WOULD MEET ONE OF OUR PRESSING NEEDS.

AS WE ARE ALL AWARE, INFORMATION COLLECTION AND STORAGE ON THESE AND OTHER THEMES AND ISSUES IS ONLY ONE PART OF THE EQUATION. ITS READY RETRIEVAL, AVAILABILITY AND USE IS THE OTHER PART. THIS CENTER MUST BE ADEQUATELY EQUIPPED TO DISCHARGE THIS TASK AND FUNCTION EQUALLY WELL. I AM SURE THAT THE DELEGATES WILL BE EXAMINING THE NEEDS OF HARDWARE, SOFTWARE, USER LINKAGE NETWORK SERVICES AND OTHER ASPECTS WHICH ARE PART AND PARCEL OF THE MISSION OF THE RENRIC PROJECT. AS WE ALL APPRECIATE, THE MISSION OF ANY ORGANISATION IS BEST DEFINED BY ITS CUSTOMERS, CLIENTS OR THE MARKET IT SEEKS TO SERVE. THIS SHOULD NO DOUBT BE RELEVANT FOR RENRIC TOO.

THERE IS ALSO ANOTHER RELATED TASK TO WHICH THE DELEGATES FROM SAARC COUNTRIES MAY NEED TO ADDRESS THEIR MINDS WHEN THEY RETURN HOME. THAT IS, TO ACTIVATE YOUR GOVERNMENT TO ENSURE THAT A CLOSER WORKING RELATIONSHIP IS ESTABLISHED BETWEEN SAARC AND SACEP ON ENVIRONMENTAL MATTERS. AS YOU ARE AWARE THE MEETING OF SAARC HEADS OF STATE HELD LAST YEAR IN NOVEMBER AT MALE DECIDED ON SEVERAL ISSUES ON ENVIRONMENT WHICH ARE ALSO OF RELEVANCE TO THIS WORKSHOP, SUCH AS;

- THE NEED TO CO-ORDINATE OUR POSITIONS FOR THE UNCED CONFERENCE IN BRAZIL;

- TO FINALISE THE STUDY AND ACTION PROGRAMME ON CAUSES AND CONSEQUENCES OF NATURAL DISASTERS AND ENVIRONMENT PROTECTION;

- CO-ORDINATE POSITIONS ON CLIMATE CHANGE AND MOBILISE ADDITIONAL FINANCES AND TECHNOLOGY FOR THESE TASKS; AND TO

- CO-OPERATE IN THE FIELD OF BIOTECHNOLOGY AND ESTABLISH GENE BANKS FOR FOOD PRODUCTION AND MEDICAL PURPOSES.

IN THESE TASKS, SAARC SHOULD HAVE A CLOSER WORKING RELATIONSHIP WITH SACEP SO THAT EFFORTS ARE NOT DUPLICATED. OTHER SUB-REGIONAL GROUPS IN THE REGION HAVE ALREADY ESTABLISHED SUCH COORDINATION SPEC WITH SPREP IN THE SOUTH PACIFIC, AND ASEAN WITH ASEP. YOUR GOVERNMENTS MAY NEED TO SEEK A SIMILAR PATTERN OF RELATIONSHIPS BETWEEN SAARC AND SACEP.

IN CONCLUSION, WHILE WELCOMING DELEGATES FROM OTHER COUNTRIES TO SRI LANKA, MAY I WISH YOUR DELIBERATIONS AT THIS WORKSHOP ALL SUCCESS. I AM AWARE OF THE WORK BEING DONE BY THE DIRECTOR AND STAFF OF THE SACEP AND THE LOCAL CONSULTANT TO THE RENRIC PROJECT WITH WHICH MY OWN MINISTRY IS ALSO CLOSELY INVOLVED. I WISH THEIR FUTURE ENDEAVOURS ALL SUCCESS. FINALLY I THANK ALL OF YOU FOR YOUR PRESENCE AND SUPPORT GIVEN FOR THIS PROJECT. PROJECTS SUCH AS THESE NOT ONLY PROVIDE THE CUTTING EDGE TO DEVELOPMENT BUT COULD ALSO SUPPORT OUR ENDEAVOURS FOR A "COMMON FUTURE".

THANK YOU.

VOTE OF THANKS by Mr. A M S Hoque, Director, SACEP

Mr. Hoque thanked the speakers, the participants of the Workshops the agencies supporting projects in SACEP and RENRIC, the distinguished invitees present at the meeting, and the organisers of the Workshop.

ANNEX III

ANNEX III

REGIONAL ENVIRONMENTAL & NATURAL RESOURCES INFORMATION CENTRE
SOUTH ASIA CO-OPERATIVE ENVIRONMENT PROGRAMME

RENRIC WORKSHOP I
COLOMBO, SRI LANKA
21 - 23 FEBRUARY 1991

PROGRAMME SCHEDULE

DAY 1 - 21ST FEBRUARY 1991

09.30 - 10.30 HRS	-	REGISTRATION
10.30 - 11.30 HRS	-	OPENING OF WORKSHOP
12.00 - 13.30	-	LUNCH
13.30 - 17.00	-	PRESENTATION OF SRI LANKAN EXPERIENCE by Vidya Jothi Dr A.N.S.Kulasinghe.

DAY 2 - 22ND FEBRUARY 1991

08.30 - 10.30 HRS	-	PRESENTATION OF INDIAN EXPERIENCE
10.30 - 11.00 HRS	-	TEA
11.00 - 12.30	-	PRESENTATION OF PAKISTAN EXPERIENCE
12.30 - 13.30 HRS	-	LUNCH
14.30 - 17.00 HRS	-	FIELD TRIP TO NATIONAL ENGINEERING AND RESEARCH DEVELOPMENT CENTRE.

DAY 3 - 23RD FEBRUARY 1991

08.30 - 10.30 HRS	-	PRESENTATION OF ANY OTHER COUNTRY EXPERIENCES
10.30 - 11.00 HRS	-	TEA
11.00 - 12.00 HRS	-	DISCUSSION ON THE PRESENTATIONS MADE AND THE FUTURE OF THE RENRIC PROJECT.
12.00 - 16.00 HRS	-	FREE
16.00 HRS.	-	ADOPTION OF THE REPORT AND CLOSING SESSION.

ANNEX IV

ENVIS - A SYSTEM OF ENVIRONMENTAL INFORMATION IN INDIA : A REVIEW

HARJIT SINGH

ADVISOR

MINISTRY OF ENVIRONMENT & FORESTS

PARYAVARAN BHAWAN

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NEW DELHI - 110 003

INDIA

1. The Preamble

Environmental problems are increasing. The global challenges that we face are greater than ever before. Developing countries are facing the obvious life-threatening challanges of desertification, deforestation and pollution and are enduring most of the poverty associated with environmental degradation. Rational management of the environmental is needed and must be based on a Sound knowledge of all the interacting elements within the larger frame work of sustainable development. The knowledge needed for achieving the sustainable development is complex, interdisciplinary, cross-sectoral, wide ranging in scope and rapidly evolving. A crucial area in the quest for such knowledge is the availability of information and reliable information is required as the basis for all Sound decisions. Information is a source, which together with physical, economical, technical and man power resources is needed for national development. Throughout the history of human societies, and even more fundamentally throughout the evolution of man, it has been demonstrated that information (and knowledge in general) is necessary for survival and progress. Creation, procurement, organisation, dessemination and use of information are vital tools for socio-economic development.

All countries have entered the information age. This is true for the more industrialized

countries, where the information has become predominant. (Porat and Rubin, 1977). But this is also true for the developing countries where not only the information sector is growing, but the information revolution is imported from more advanced countries as a result of the decisive role played by information in all activities for innovation and control and the increasing international division of labour (Menon, 1985).

Thus, information in a broad sense, and with various definitions is now considered a vital resource both for national development and international relations (UNESCO, 1979). Sustainable Development requires intelligent environmental decisions. These can only be made with the right information.

2. The role of environmental information

Development poses many questions at many levels, and some of the most important of these concern environmental impact in the long and short term, at community, national and international levels. Environmentally sound decisions cannot be taken in an information vaccum. Solid information is needed to answer those questions and to plan for development that will be sustainable.

Rational management of the enviornment requires an upto date information on various aspects of the environment which control and govern it directly or indirectly. Timely availability of reliable and relevant environmental information is thus very important.

3. The need for a National Information System

Information is a resource, when utilized, leads to knowledge. Like other resources it must be discovered, assessed and processed to become useful. It is vital that all Governments develop their information capability for the development of an effective environmental information system:

The process of environmental policy making is often hampered by inadequate information. The causes of this problem are among others, the scattered distribution of environmental information over many sources and great differences in quality of information from various sources. Information gathering is therefore to often a time consumbing activity (Adriqanse et al. 1988).

Environmental Information being extremely broad and multidisciplinary in scope, it may not be possible for any individual organisation/agency to provide detailed information on all aspects.

It is therefore logical to have co-ordination/ linkage with various organisations capable of providing information on different specialist subjects and thus form a comprehensive, quick, responsive and wide ranging information system. Such system improves the accessibility and use of enviornmental information.

The development of an information system on environment is quite complex and distinct from the development of information system in particular areas of relating to specific projects or problems. The system has to take into account the specific information requirement of each development sector so far as it's relevance to environment is concerned.

4. ENVIS Net Work

Realising the imortance of Environmental Information, the Government of India, in December 1982 established an Enviornmental Information System (ENVIS) as a plan programme. The focus of ENVIS since inception has been on providing environmental information to decision maker, policy planners, scientists and engineers research workers etc. all over the country.

Since environment is a broad-ranging, multi-disciplinary subject, a comprehensive information system on enviornment would necessarily involve

effective participation of concerned institutions/ organisations in the country that are actively engaged in work relating to different subject areas of environment. ENVIS has, therefore, to develop itself with a network of such participating institutions/organisations for the programme to be meaningful. ENVIS Centres in the different subject areas of enviornment constitute the nodes in this network development. A large number of ENVIS Centres have to be established in the network in a phased manner till a reasonable coverage of subject areas of environment is achieved.

ENVIS is a decentralised system with a network of distributed subject oriented Centres ensuring integration of national efforts in environmental information collection, collation, storage, retrival and dissemination, of avoiding duplication of efforts. Presently the ENVIS net work consists of focal point at the Ministry of Environment and to ENVIS Centres set-up in different organisations/ establishments in the country in selected areas of enviornment. These Centres have been set up in the areas of pollution control, toxic chemicals, central and offshore ecology, environmentally bound and appropriate technology biodegradation of wastes and environment management. The list of ENVIS Centres is given at Table I and ENVIS operating links are described in figure I.

4.1.1 Long-term objectives

- to build up a repository and dissemination centre in Environmental Science and Engineering ;
- to gear up the modern technologies of acquisition, processing, storage, retrieval and dissemination of information of environmental nature; and
- to support and promote research, development and innovation in environmental information technology.

4.1.2 Short-term objectives

- to provide national environmental information service relevant to present needs and capable of development to meet the future needs of the users, originators, processors and disseminators of information;
- to build up storage, retrievalf and disemination capabilities with the ultimate objective of disseminating information speedily to the users;
- to promote national and international cooperation and liaison for exchange of environment related information;
- to promote, support and assist education and personnel training programmes designed to enhance enviornmental information processing and utilization capabilities;

- Establishment of a Data Bank containing data on some selected parameters, and computerisation in important application areas of environment;
- identification of data gaps and knowledge gaps in specified subject areas and action to fill these gaps;
- liaison with relevant International Information Systems and other National Information Systems;
- information analysis and development of Environmental Statistics;
- pareparation of a quarterly Abstracting Journal, 'Paryavaran Abstracts';
- Bringing out various other publications on Current Awareness services, etc.;
- organising training and seminars;
- monitoring and reviewwing of ENVIS; and
- assisting the Scientific Advisory Committee of ENVIS with inputs and rendering other secretarial help.

ENVIS Centres

- building up a good collection of books, reports and journals in the particular subject area of environment;
- establishment of linkages with all information sources in the particular subject area of environment;

- responding to user queries;
- Establishment of a data bank on some selected parameters relating to the subject area;
- Coordination with the Focal Point for supplying relevant, adequate and timely information to the users;
- Helping the Focal Point in gradually building up an inventory of information material available at the Centres;
- identification of information gaps in the specified subject area and action to fill these gaps;
- bringing out newsletters/publications in their subject area for wide dissemination.

4.3 Criteria for selection of ENVIS Centres

- ENVIS Centres are to be set up on subject areas of concern and priority;
- ENVIS Centres are to be located in leading Institutions/Organisations in the country in particular subject areas;
- the Institute/Organisation having an ENVIS Centre should have the necessary expertise and capability to run a subject oriented Information Centre and should have the interest and willingness to serve the user community of ENVIS with substative information when required.

5. Potential users

The ENVIS network provides relevant and speedy information to decision makers, Government planning and policy making bodies, individual administrators, executives in industry, research institutions, universities, international organisations, Environmental activists, NGOs, Research workers and social scientists. ENVIS also provides information to many other public and private bodies. A brief description of need based information products is given in fig. 2.

6. ENVIS focal point - the services

The ENVIS has built up a reasonably good information base in the form of publications, reports, reprints, bibliographies, abstracts, data bases etc., as well as numerical data i.e. statistics relating to enviornment. The information base/ repository is being continuously strengthened. This involves regular collection, collation and storage of scientific and technical information on enviornment and related areas. The establishment of several ENVIS Centres, located in different organisations/institutions in the country in selected areas of environment, as part of ENVIS Network has considerably assisted in building up and strengthening of this information base. Brief description of services provided by the ENVIS Focal Point is given below :

6.1 Query/Answer service

The ENVIS network as a whole responds to

various requests for information on diverse areas related to environment from different user groups. Besides receiving several National/International queries ENVIS as the National Focal Point of INFOTERRA/ UNEP and Regional service Centres of INFOTERRA has also been receiving queries from INFOTERRA using and from South Asian sub-region countries. All such queries are responded to by supplying substantive information in the form of bibliographies, photo copies of reprints/reports etc. upto the period ending December 1990, the ENVIS focal point alone handled 4125 national/international queries (Fig. 3). A detailed break up of the number of national and international queries responded by the ENVIS focal point is given in Fig. 4. During the years 1988 and 1989, total No. of queries processed by ENVIS Centres are 1993 and 2251 respectively. out of which National queries are 1872 in the year 1988 and 1987 in the year 1989. The international queries are 121 and 204 respectively during 1988 and 1989.

6.2 Referral service

In some cases where ENVIS focal point is unable to provide substantive information, referral services are provided to users. Referral means receiving requests for information and referring inqueries to the sources most likely to be able to provide the desired information. For responding to the queries, focal point make use of the ENVIS network, INFOTERRA network as well as other potential

sources of information in the country. ENVIS referral procedure is shown in Fig. 5.

6.3 Abstracting service

The Focal Point regularly brings out a quarterly abstracting journal "Paryavaran Abstracts" containing information about the Indian Research inputs in the area of environment. The journal has a circulation of over 2000. More than 500 environment related journals are referred to in the compilation of these abstracts. The abstracts are arranged under 12 major subject categories i.e. Enviornmental Management, Air Pollution, Water Pollution, Noise Pollution, Ecology, Nature and Natural Resources Conservation, Health and Toxicology, Wastes, Forestry & Environment, Wildlife, Energy and Plants & Pollution. For precise retrieval of information, subject key words index is also given at the end of each issue.

6.4 Press Clipping Service

The ENVIS Focal Point also scans all environment related information from the National Dailies and Megazines. About 30 News papers and 10 magazines are scanned regularly and more than 500 clippings related to enviornment are documented every month to ensure easy retrieval.

7. Documentation

The focal point is engaged in collection, storage, retrieval and dissemination of information on various enviornment related areas. The information is collected in the form of books, reports, journals monographs, bibliographies etc. and are classified subjectwise for future retrieval of information. The efforts of information collection are supported by a well equipped Library of the Ministry of Environment & Forests which is also managed by ENVIS. The Library in the Department has a collection of over 16000 books, technical reports/standards & specifications, Conference proceedings etc., on environment and other related areas. In addition, there are over 3000 scientific and technical reports. The Library subscribes to over 150 national/international journals.

7.2 Development of Data Bases

Use of computer has been made in the storage and retrieval of information. ENVIS has been provided with a terminal which is linked to super AT computer installed in the Ministry. In addition, PC/XT and PC/AT are also available. Using the computers, the following data bases have been developed :-

i) A computerised bibliographic data base "Paryavaran Abstracts" containing information derived from Indian research work on environment and related areas has been developed. The information

could be retrieved using author name, journal name, subject key-words etc.

ii) A computerised Directory of the Indian Sources of Environment Information has been developed using CDS-ISIS software.

iii) A data base containing profiles of various Non-governmental Organisations working in the area of environment in the country is also available.

iv) Data on the various subject experts on enviornment & related areas was compiled and is available on computers. However, the information is being revised and updated.

7.3 INFOTERRA/RSC activities

The Focal Point of ENVIS acts as the National Focal Point (NFP) of INFOTERRA network (An international referral system for sources of information) of the United Nations Environment Programme (UNEP). As INFOTERRA-NFP ENVIS Focal Point is creating, maintaining and operating a national information system and connecting it to the international INFOTERRA network. The ENVIS Focal Point is the co-ordinating mechanism for all INFOTERRA activities within India and is concerned both with Policy and operational aspects of environmental information flow.

As INFOTERRA-NFP, the focal point has registered more than 500 Indian Sources engaged in environment related activities for inclusion in the 'International INFOTERRA Directory of Environmental Sources" being published by the UNEP. These national sources are referred to by UNEP for environmental information in their corresponding disciplines. The NFP caters to the environmental information needs of the users from both within and outside the country. Based on the information potential of ENVIS, UNEP has also designated ENVIS Focal Point as the Regional Service Centre (RSC) of INFOTERRA to cater to the environmental information needs of the South Asian Sub-Region countries.

7.4 Net working and Data communications

This is an era of information society. Three factors - technological advances in computers, electronic media and telecommunications mark the coming of such a society. In such a society not just production of information but access to it, the facilities to produce, store, and transmit information become vital to development.

Telecommunications is a modern tool to convey information and hence can be critical to development process. By providing the information links between urban and rural areas, telecommunications can help

in overcoming the distance barrier which hamper rural development itself. Although there is an increasing popularity of broadcasting and telecasting development projects, the momentum is yet to gain for interactive telecommunications using computers.

The basic idea behind data communications is to share information as well as computing resources like storage and Input/Output (I/O) devices etc. The entire operation of data communications could be extended to a transportation network which virtually runs with the help of computers.

The specific data communication facilities which are widely used, are; Electronic mail (E-mail) and buletin board. E-mail is proving to be a cost effective and efficient medium for communication. Most developing countries will be benefited when the rates for computers and telecommunication costs will come down in future.

ENVIS Net work has initiated data communication activities and would be connected to major networking agencies shortly. India link data communication project is described in Fig. 6. Besides ENVIS also maintain close liaison with various other National Information Systems like National Information System on Science and Technology (NISSAT) Biotechnology Information System (BTIS) for exchanging environmental information and to avoid duplication of efforts in the concerned fields.

- In addition the Centre has been responding to specific queries related to toxicology and toxic chemicals received from various users.

8.3 ENVIS Centre at National Institute of Occupational Health, Ahmedabad.

The Centre is engaged in the information activities related to Occupational Health. The activities include the following :-

- Monographs on different toxic substances used in various industries and are hazardous to health have been prepared. These monographs cover History, Production, Labourers involved hazards associated with these chemicals, effective legislation and the precaution to be taken by the workers. The monographs have been prepared on (i) Asbestos - Everybodies problem, (ii) Dye & Dyestuff, (iii) DDT, (iv) Clorine. Monographs on some of the commonly used toxic gasses such as Ammonia, Phosgene and Sulphur Dioxide are being prepared.
- Chemicals safety cards containing common information like formula, physical property, chemical property, hazardous symptoms, prevention and precaution, first aid, spillage, storage and transport, fire and explosion etc. have been prepared.

7.5 Co-ordination with ENVIS Centres

The ENVIS Focal Point Coordinates, monitors and reviews the activities of the ENVIS Centres periodically and provides necessary guidelines to the Centres to ensure effective functioning of the ENVIS net work. Attempts are also being made by the Focal Point to ensure constant inflow of information from the ENVIS Centres, so that a Central repository of environmental information on various subject areas is developed/updated for easy and quick retrival and dissemination. The Focal Point is also responsible for identifying priority areas and potential institutions for setting up new ENVIS Centres.

8. Activities of ENVIS Centres

All the ENVIS Centres are engaged in collection, collation, retrieval and dissemination of information in their respective areas of specialisation. A brief account of the major activities undertaken/ being undertaken by each of the ENVIS Centre is given below :-

8.1 ENVIS Centre at Central Pollution Control Board, New Delhi.

This Centre is engaged in information activities related to Pollution Control (Water & Air).

The activities include the following :-

- Collection of information with regard to the status of effluent treatment plants in various industries in the country. The information has been compiled in the form of a report and a national inventory of water polluting industries and effluent treatment plant status has been published. It contains information about 4000 industries upto 1984. The information is being updated and being computerised.
- The information with regard to the prosecutions launched against the defaulters by Pollution Controfl Board has been collected.
- The Centre has, since October 1988, started bringing out a quarterly newsletter which includes data, reports, news regarding quality of the environment, toxicity of the pollutants, latest developments in the area of pollution control technologies etc.
- The Centre is working in the direction of bringing out a data book on Annual Water Quality Data of Fresh Water Bodies and Wells for the period 1979-88.

- The Centre also responds to specific queries from various users and provides substantive information to the extent possible.

8.2 ENVIS Centre at ITRC, Lucknow

The Centre is engaged in the information activities related to toxic chemicals. The activities include the following:-

- Compilation of toxicity data hand book. So far, four volumes have been published. Volumes 1 & 2 contain information on 109 industrial chemicals, while volumes 3 & 4 contain information on 119 gesticides. The information on these chemicals has been computerised with 228 chemicals on file and the complete data base is proposed to be ready in another two years.
- State of the Art Reports on (i) Environmental Hygiene in India and (ii) Occupational Health in India, have been published by the ENVIS Centre.
- Several bibliographies have been compiled. The major among them include (i) Industrial and Environmental Health, 1945 to 1984, (ii) Pollution problems in Pulp & Paper Industry, (iii) Annotated bibliography of tanning industry in India.

- In addition the Centre has been responding to specific queries related to toxicology and toxic chemicals received from various users.

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- Chemicals safety cards containing common information like formula, physical property, chemical property, hazardous symptoms, prevention and precaution, first aid, spillage, storage and transport, fire and explosion etc. have been prepared.

- Bibliographies on trace metals which are hazardous to human health particularly the workers directly associated with these metals have been prepared.
- In addition the Centre is regularly responding to specific queries related to medical toxicology, occupational health, occupational medicine etc. received from various users.
- The Centre is using the facility of MEDLARS search being provided by NIC-ICMR, Bio-medical Information Centre.

8.4 ENVIS Centre at Centre for Ecological Sciences, Indian Institute of Science, Bangalore

The environmental information related to biological diversity and western ghats is being collected and disseminated to all concerned, by this ENVIS Centre. The major activities include the following:-

- The Centre has made a good collection of documents related to Western Ghats and Nilgiri Biosphere Reserves. The collection on Nilgiri Biosphere Reserve includes the general history of the areas, geology of soil, flora and fauna, climate, hydrology, forest administration, people, agriculture etc. Statistics on holdings, area and yield of different crops, human settlements and

working of forests for the period 1976-1985 has been collected.

- The Centre has been developing an upto date inventory and a computer based system of information for Birds on Western Ghats.
- Check list of plants has been prepared for Karnataka and Nilgiri Biosphere Reserves. An information system for Plants of Karnataka dealing with zones, altitudes, habitat, life farm Phyto geographic affinities have been developed.
- Several reports have been published which include :-
  i) Role of protected areas in conservation
  ii) Bibliography for the Nilgiri Bio sphere Reserve
  iii) Bibliographic distribution of plant species in Karnataka etc.

8.5 ENVIS Centre at EPCO, Bhopal

The Centre is engaged in collection of information with regard to the environmental management in the State of Madhya Pradesh. The information is compiled in the form of reports for dissemination to all concerned. The Centre has broughtout several publications, the major among these are :-

- State of the Art Report on

a) Utilisation of over-burden and fly ash as building material.

b) Environmental status of Amarkantak regions.

c) Environmental status of river Kshipra- Preliminary Study on Problems and Perspectives.

- Report on Environmental Pressure areas and regions in Madhya Pradesh.
- Directory of Non-Governmental Organisation in Environment in Madhya Pradesh.
- The information on forest, tribal areas and water quality has been compiled.
- Information about the status of environmental research in various universities in Madhya Pradesh is being compiled.
- In addition, the Centre is undertaking abstracting service, press clipping service as well as responding to specific queries received from various users.

8.6 ENVIS Centre at Environmental Services Group, New Delhi

The Centre is engaged in collection of information in the areas of (i) Parliament & Environment, (ii) Media and Environment, (iii) Non-Governmental Organisations in the area of Environmental Protection in the country. The information is being disseminated to all concerned. The major accomplishments of the Centre include :-

- Publication of a Directory of Environ-

mental NGOs in India.

- Preparation of Directories on Environmental NGOs in United States and Europe.
- Collection of information related to environmental issues from the proceedings of both the Houses of Parliament.
- Maintenance of profiles of media coverage on different important areas related to enviornment.

8.7 ENVIS Centre at Tata Energy Research Institute, New Delhi.

The Centre functions as a repository of knowledge in the field of energy and environment. The activities undertaken/being undertaken by the Centre are as follows :-

- A biannual journal "Energy Environment Monitor" is being brought out by the ENVIS Centre. The journal also includes information on recent literature in this area.
- The information on recent literature is being computerised in the form of a data base for future retrieval.
- The Centre has good repository of information which is continuously being expanded over the years.
- The Centre attend to users queries and provide substantive information against each of the query to the extent possible.

8.8 ENVIS Centre at Anna University, Madras

The Centre is engaged in collection of information in the area of Biodegradation of Wastes and Environmental Impact Assessment. The information is being disseminated to all concerned. The activities include the following :-

- The Centre regularly brings out environmental abstracts on (i) Bio-degradation of Wastes, (ii) Environmental Impact Assessment.
- Has prepared a report, "Eco-toxicological problems related to the use of household detergents and cosmatics and abuse of chemical pesticides".
- Has been preparing State of the Art Reports on (i) Bio-degradation of Wastes and (ii) Environmental Impact Assessment.
- The Centre has made a good collection of books, journals, reports, thesis etc. on the subject which provide a good resource base for information dissemination.

8.9 ENVIS Centre at Society for Development Alternatives

The Centre is engaged in catering to the environmental information needs in the area of environmentally sound and appropriate technologies. The technologies brief are disseminated to all concerned. The Centre has designed an Environmentally Sound and Appropriate Technology (ESAT) data base

which includes bibliographies as well as numeric data. The major achievements of the Centre are :-

- Creation of an information rich ESAT data base.
- High Quality document collection in thrust areas.
- Operating low cost information system.
- Enhanced speed of response.
- Expanding information network.
- Regional Centre for World Commission on Environment Development (WCED) activities.

8.10 ENVIS Centre at Andhra University, Visakhapatnam

This Centre is engaged in collection, collation, retrieval and dissemination of environmental information in the area of Eastern Ghats. The activities of the Centre are as follows :

- Development of a documentary and numerical information base related to Eastern Ghats.
- Dissemination of information in the area of Eastern Ghats on a regular basis.
- On line information retrieval using DIALOG.
- Reference service, Press Clipping service etc.
- The Centre has also taken up the job of compiling a status report on the State of Environment in India.

8.11 Proposed New ENVIS Centres

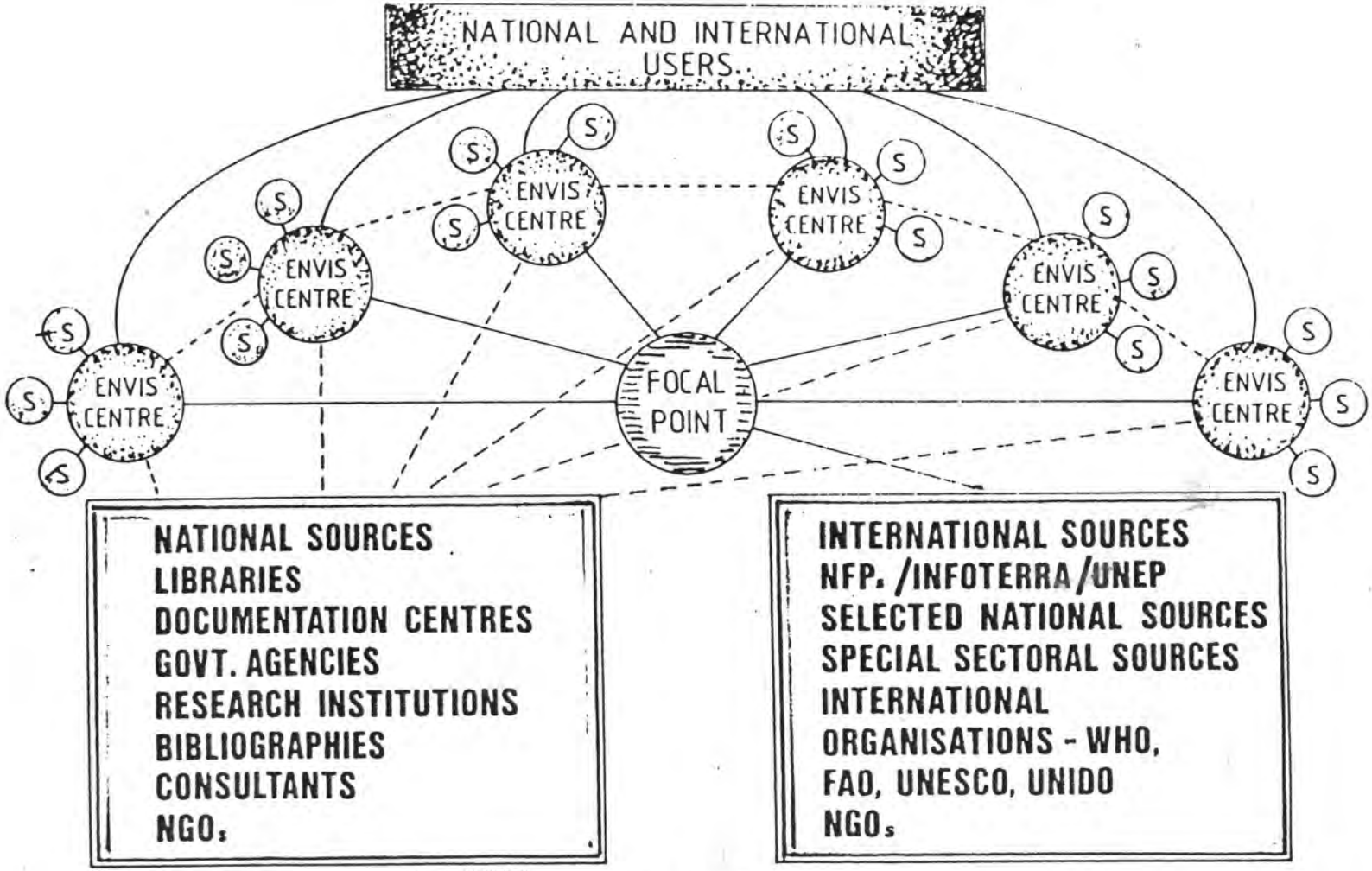
The following new ENVIS Centres in priority areas mentioned below are being approved in principle for setting up during the eighth Five Year Plan in phases :

S.No.	Subject Area	Institute
1.	Plant Ecology	Botanical Survey of India. Calcutta.
2.	Animal Ecology	Zoological Survey of India, Calcutta.
3.	Environmental Problems of Mining.	Indian School of Mines, Dhanbad.
4.	Desertification	Centre Arid Zone Research Institute, CAZRI,' Jodhpur.
5.	Solid Waste including Hazardous Wastes.	NEERI, Nagpur.
6.	Human Settlements	School of Planning and Architecture, New Delhi.
7.	Estuary, Mangroves, Corals and Lagoons	Centre for Advanced Study in Marine Biology, Annamalai University.
8.	Environmental Education	Centre for Environment Education, Ahmedabad.
9.	Environmental Policy & Law	Jawaharlal Nehru University, New Delhi.
10.	Himalayan Ecology	Gobind Ballabh Pant Himalayan Paryavaran Evam Vikas Sansthan.

Table I

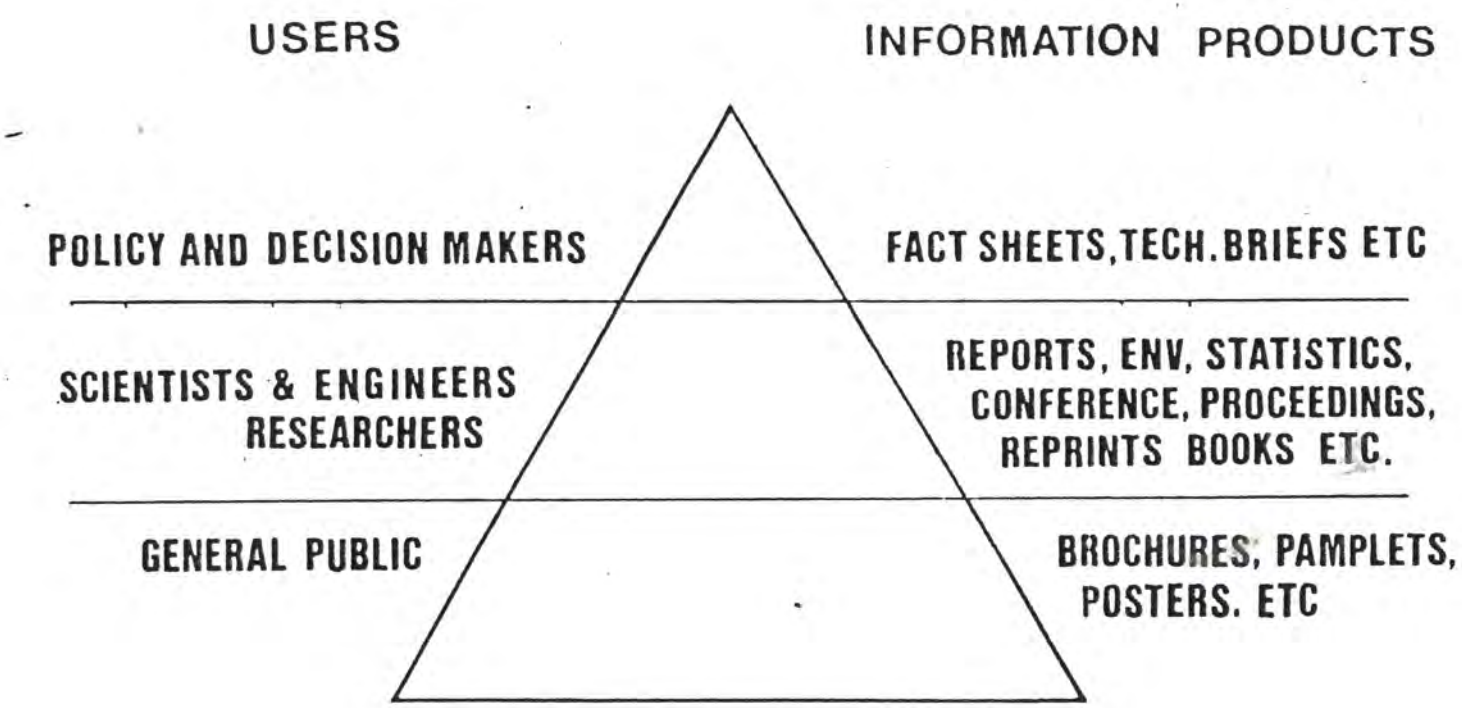
List of ENVIS Centres

S.No.	Area	Institution	Contact Person
1.	Pollution Control (Water & Air)	Central Pollution Control Board, Parivesh Bhawan, CBD-cum-Office Complex, East Arjun Nagar, Delhi-32.	Chairman
2.	Toxic Chemicals	Industrial Toxicology Research Centre, Mahatma Gandhi Road, Lucknow-226 001.	Director
3.	Eastern Ghats	Andhra University, Visakhapatnam-530003.	Director
4.	Environmentally Sound and Appropriate Technologies	Society for Development Alternatives, B-32, Institutional Area, New Mehrauli Road, Hauz Khas, New Delhi-110 016.	President
5.	Biodegradation of Wastes and Environment Impact Assessment	Centre for Environmental Studies, Anna University, Guindy, Madras.	Director
6.	Renewable Energy and Environment	Tata Energy Research Institute, 7, Jor Bagh, New Delhi-110 003.	Director
7.	Western Ghats and Biological Diversity.	Centre for Ecological Sciences, Indian Institute of Science, Bangalore.	Director
8.	Non-Governmental Organisations, Media and Parliament related to environment.	Environmental Services Group B-172, Lodi Estate, New Delhi-110 003.	Director
9.	Environmental Management related to the State of Madhya Pradesh.	Environmental Planning and Coordination Organisation, Paryavaran Parishar, E-V Sector, Arera Colony, Bhopal.	Executive Director
10.	Occupational Health	National Institute of Occupational Health, Meghani Nagar, Ahmedabad.	Director

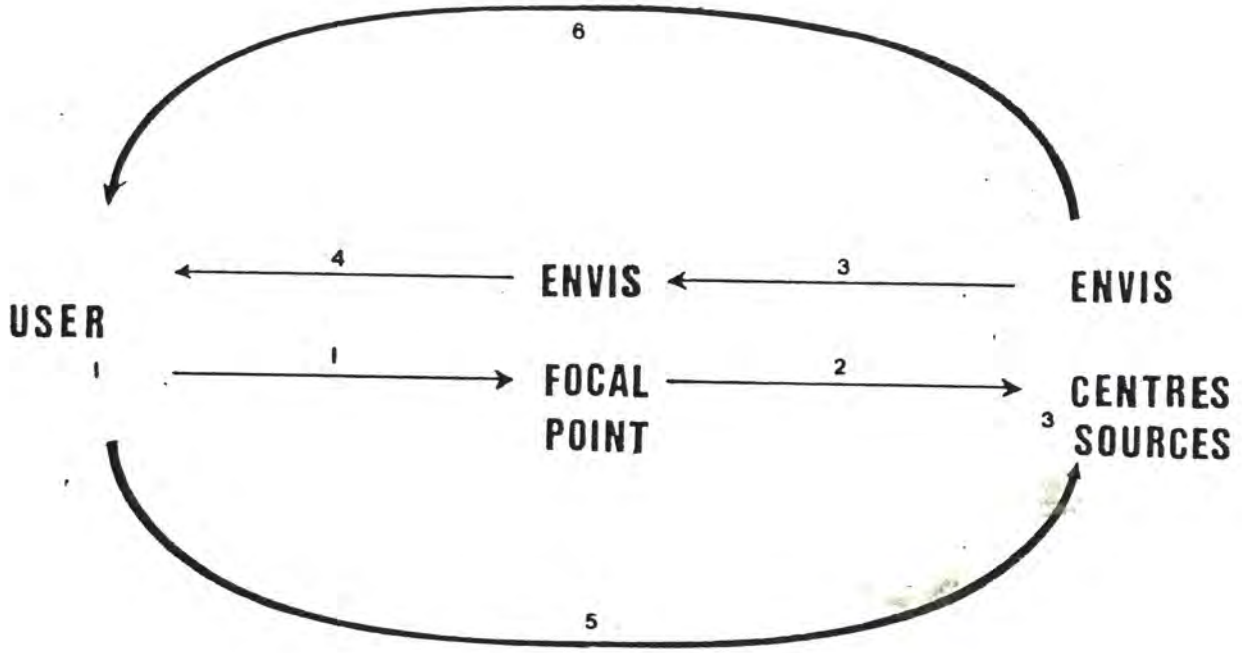


Envis Operating Links

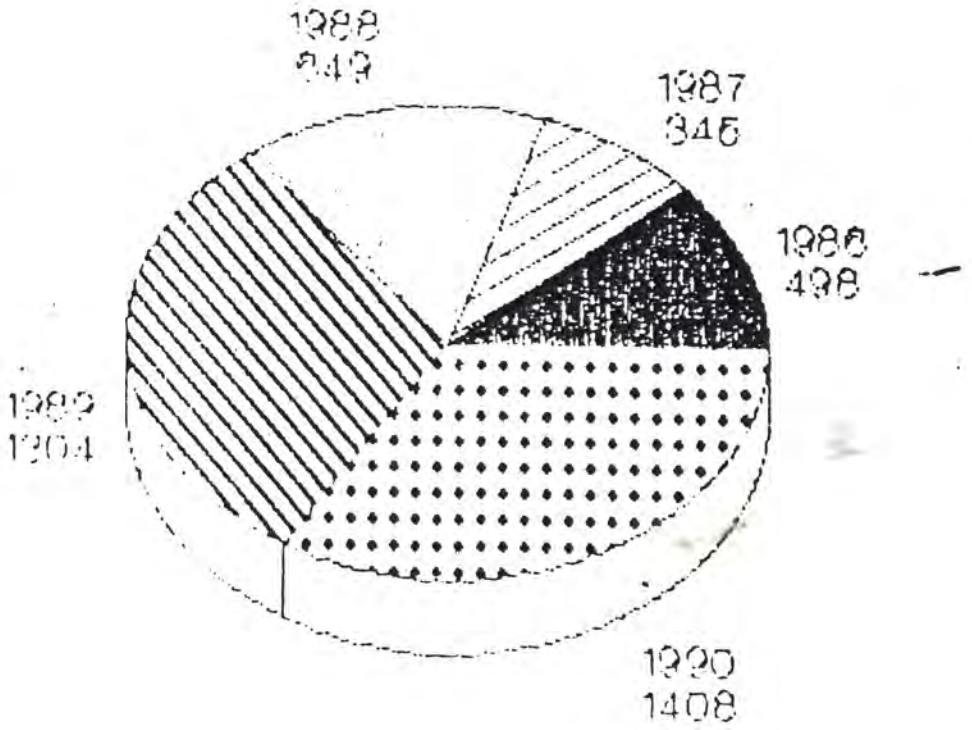
Need Based Environmental Information Products



The Referral Procedure

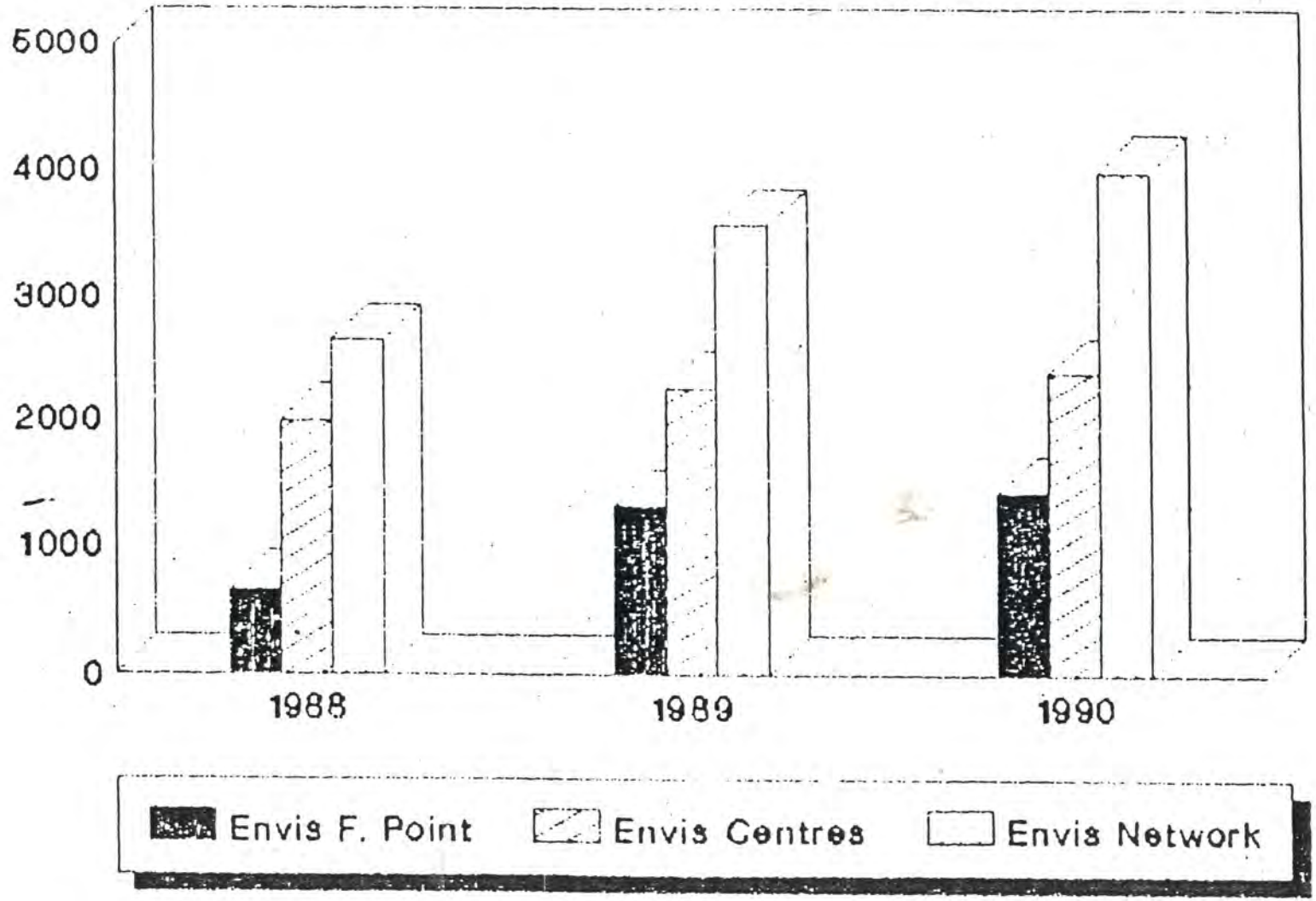


TOTAL NO OF QUERIES RESPONDED BY ENVIS FOCAL POINT SINCE 1986



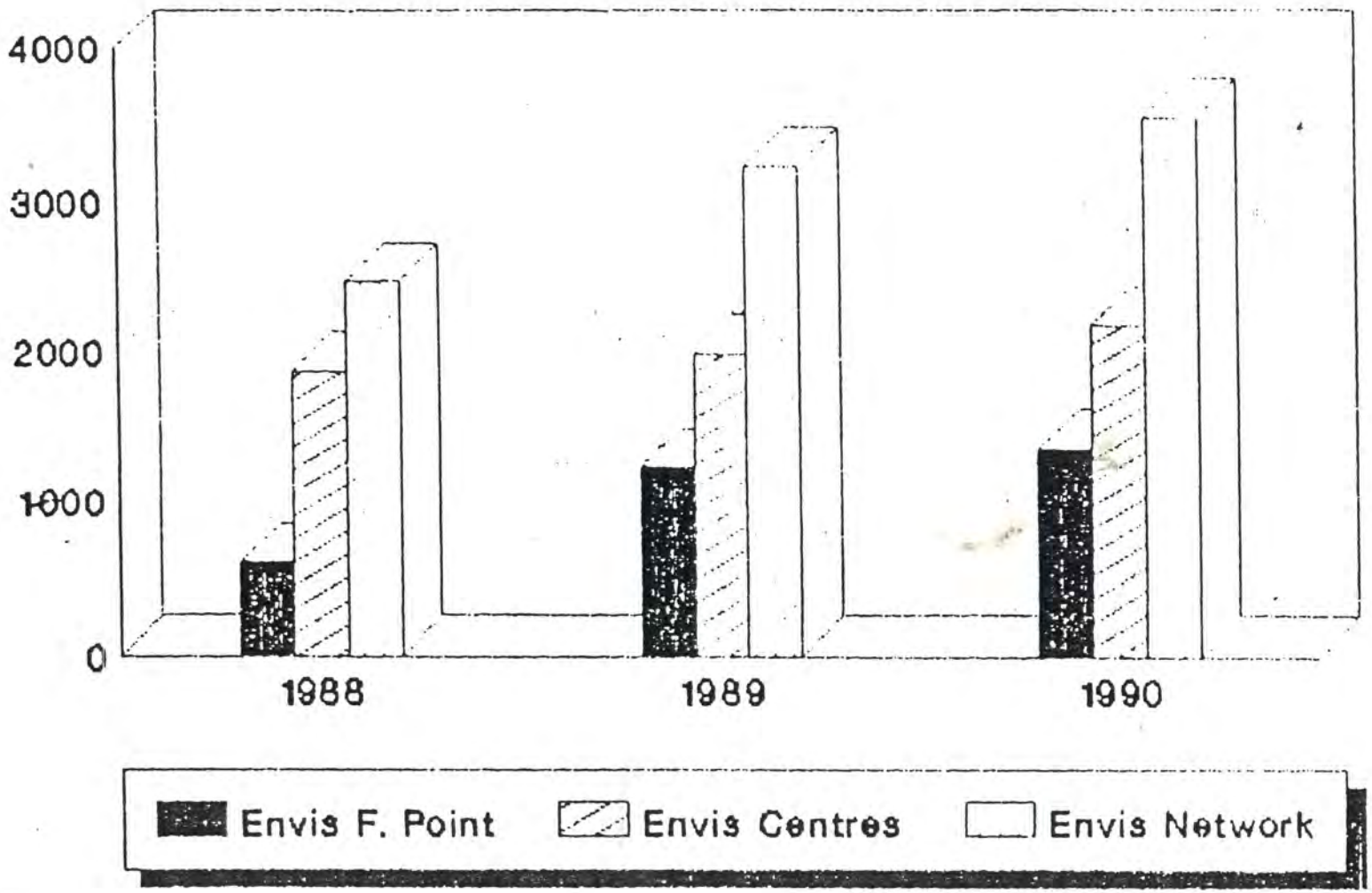
NIC

TOTAL NO OF QUERIES REPSONDED



NIC

NUMBER OF NATIONAL QUERIES RESPONDED



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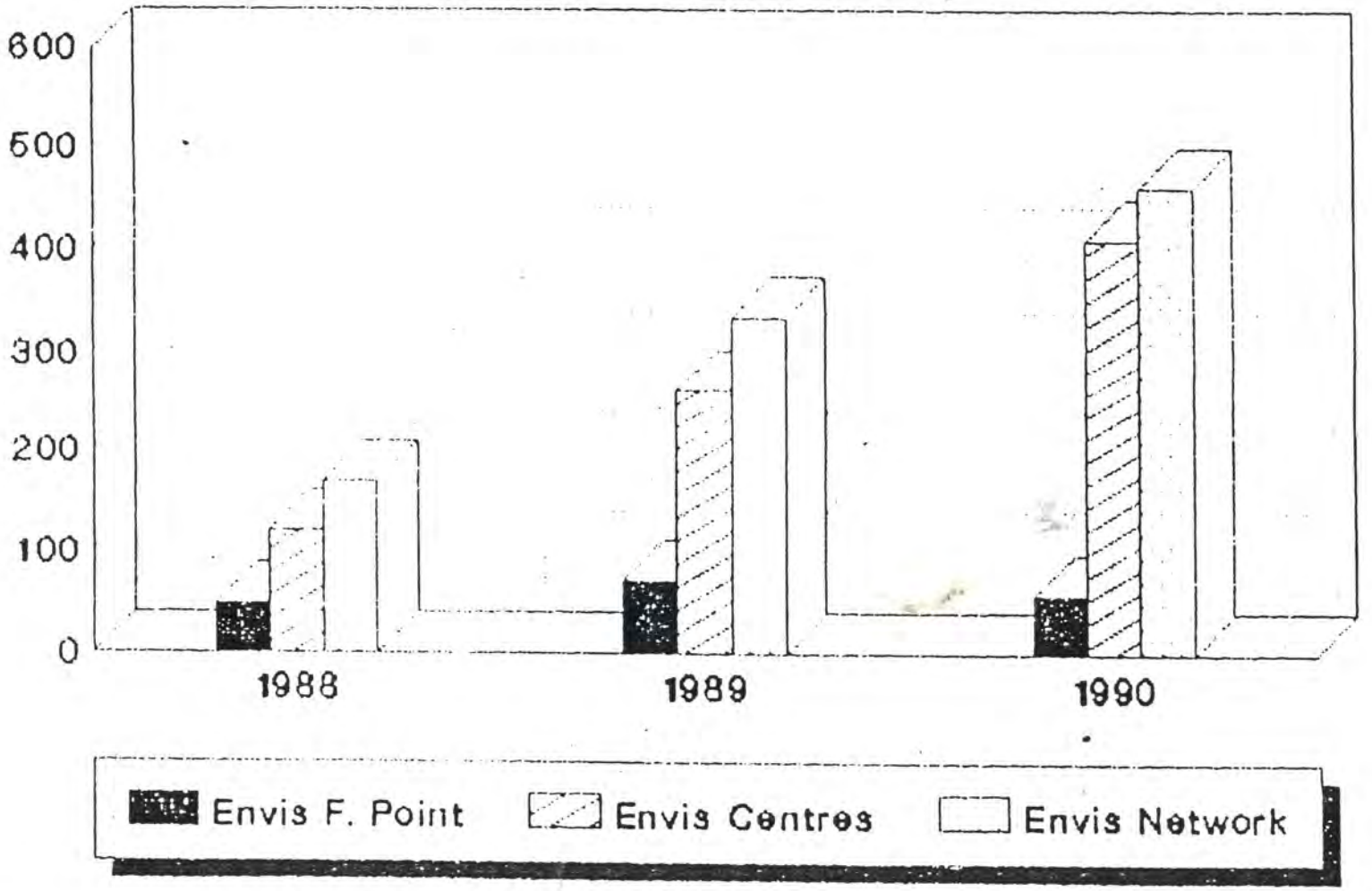
NUMBER OF INTERNATIONAL QUERIES RESPONDED



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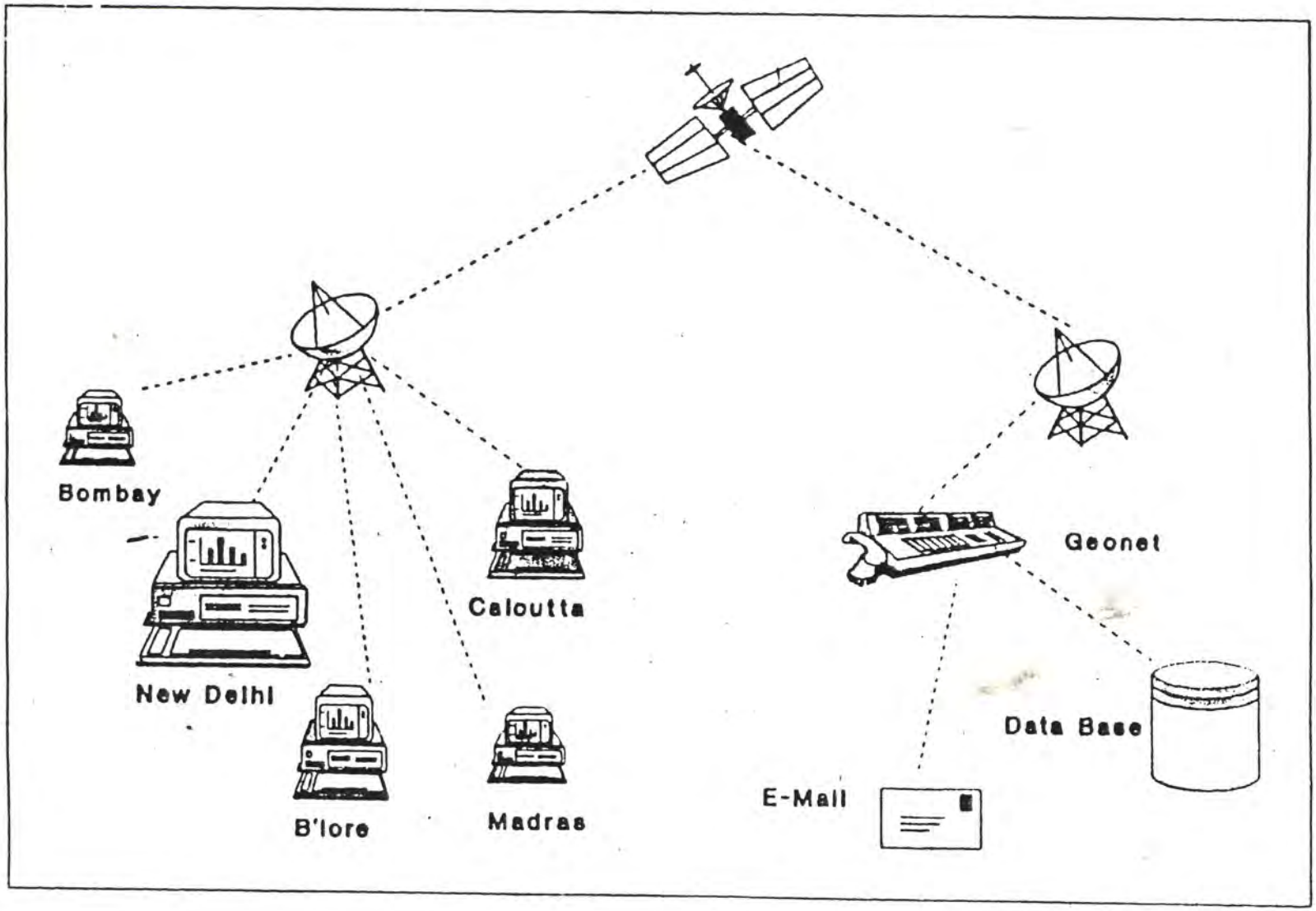
INDIA-LINK Data Communications Project



ROLE OF NON-GOVERNMENTAL ORGANISATIONS IN CREATING ENVIRONMENTAL AWARENESS IN INDIA

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1 THE RATIONALE

1.1 Today humanity is capable of destroying itself and every vestige of life from the face of earth. This can be brought about instantaneously through a nuclear holocaust or gradually by degrading and destroying the environment. It is already known that many species have disappeared from the earth either due to over-exploitation or through destruction of the forest habitat.

1.2 The present day experience is that people tend to act like the proverbial farmer who killed the goose that laid the golden egg by destroying the capital of the natural resources at an alarming rate.

1.3 However, the situation started changing and people have realised that by destroying the environment they can liquidate themselves. With the growth of the environmental concern, many things happened, particularly in terms of institutional development, enacting legislations and regulations and establishment of agencies for environment protection.

2 THE LOGISTIC REQUIREMENT

2.1 An informed public is the 'SINE QUA NON' for the success of environmental protection programmes. The people can be both protectors and destroyers of the environment and their perceptions are extremely important, particularly in a democratic society like India. Such perceptions do not develop by themselves. They have to be consciously developed among all levels by the community. The prime need of the present conditions is to provide clear awareness of the economic, ecological and political interdependence of the modern world as well as imparting a vast range of scientific and technical skills at varying levels of complexity to all members of the community. This, needless to say, is a monumental task, especially when considering a country like India, whose population is characterised by horizontal and vertical socio-economic diversities as well as multiplicity of religions and languages, where the rural urban ratio is 80:20 and where more than 50% of the population is below poverty line. In such a set up,

environmental consciousness, sensitivity and values need to be built up at all levels and at a sustained pace. It is precisely in this task that the role of voluntary agencies also referred to as non-governmental organisations or NGOs assumes great significance. In several sectors of development in India such as health, nutrition, education and rural development, NGOs have been recognised as a major supplementary force to official developmental efforts at the field level. In the field of environment too, especially in creating awareness, NGOs, community groups, professional bodies, etc., are rapidly emerging as important and cost effective partners of the Government.

2.2 The environmental movement began in the West. But over the last decade, it has spread far and wide in the so-called third world. It has already taken deep roots in India. There is no other field of science and technology, where non-governmental organisations and the media have together played a more important role in affecting public policy than in the field of the environment. Beginning with the mid sixities, public awareness remains the key issue in saving the environment. In the last few years, there has been a tremendous growth in both public and government interest in environmental issues in India. But probably the most heartening thing about this growing environmental concerns is that is being shared even by those voluntary groups who are, in fact, less concerned about the environment and more concerned about the economic development of the people.

3. THE BASIC PHILOSOPHY

3.1 It is becoming increasingly clear that NGOs have a far better understanding of the people living at the margins of substance than government agencies or the academic bodies. Their nearness to the gross roots and even more, their action programmes put NGOs in the most appropriate position to undergo the learning process needed to understand the poor and powerless before preaching to them about environmental issues. NGOs are often able to reach target groups that government agencies cannot. This is again particularly pertinent to

India with its diversity in languages, culture, religion and environmental problems. Thus, NGOs hold great potential to be efficient and effective alternatives to government agencies in the delivery of programmes and projects.

3.2 The number of voluntary agencies, community groups, academic bodies, corporate entities, etc., involved in environmental work in India has increased significantly in the last few years - so much so that their number in India is larger than that of any other third world country and probably matches the numbers found in Western countries. This may be attributed to the sharply growing awareness of the people about the depletion of natural resources due to unsustainable development activities.

3.3 Thus, an increasing number of voluntary agencies are concentrating on environmental issues as the nexus between meaningful, equitable, sustainable growth and the protection of the environment is becoming more and more apparent. Besides this increase in the number of environmental NGOs, what is more interesting is that many rural gross-roots groups whose primary concerns are rural development, tribal welfare, health, etc., have begun to take up environmental issues to demonstrate the direct link between environmental care on the one hand and human welfare, especially of the poor, on the other.

3.4 NGOs are also displaying a far greater level of professional competence in questioning and projecting alternatives to official developmental programmes. Efforts by various prominent groups to set up cooperative net works around specific projects or programmes such as Wastelands Development, Silent Valley Project, Ganga Action Plan, etc., are showing success.

3.5 There are several examples of NGOs which have protested against environmentally unsound development projects and successfully stopped them, exhorting people to appropriate alternative developmental patterns more mindful of basic human needs, involving people in

afforestating degraded lands, preventing poaching of wildlife and in carrying out programmes for creating or intensifying environmental awareness. Details of some of these NGOs are described in case studies given at the end.

4. THE NATIONAL ENVIRONMENT AWARENESS CAMPAIGN

4.1 The Government of India has not only recognised the useful role that NGOs can play in supplementing its efforts and ensuring that the benefits of various developmental schemes reach the grass root level people, but is increasingly encouraging NGOs to take on professional assignment, especially those involving, mobilising of public support for environmental protection.

4.2 One of the newest and important schemes launched by the Ministry of Environment and Forests, Government of India is entirely dependent on the NGOs for implementation. The Ministry has launched a National Environment Awareness Campaign (NEAC) in the middle of 1986 at the suggestion of the Prime Minister after a major slide-lecture presentation on the State of India's Environment by one of the NGOs of Delhi.

4.3 This Campaign leans heavily on NGOs both for development as well as dissemination of various activities for developing a community sensitivity amongst the people of India with regad to their environment and its problems. This campaign takes the communication skills, of both conventional and non-conventional, of hundreds of NGOs to get across the desired message.

4.4 During the first year, around 115 NGOs including educational institutions, professional bodies, youth clubs, womens groups, etc., organised various activities such as seminars, public meetings, camps, rallies, audio visual shows/films, street theatres, puppet shows, dance dramas, tree plantation drives, etc., at more than 1000 different locations all over the country. In 1987, the NEAC attracted participation from 207 NGOs, while in 1988, more than 215 NGOs came forward to spread awareness among people. In 1988, 1989 and 1990, an unprecedented number of NGOs about more than 300 are supported by the

Ministry to activate people at different places about different environmental issues. During the past three years, the Ministry has also been appointing certain organisations in different parts of the country to assist the Ministry in coordinating, implementing, monitoring and evaluating the NEAC activities at the regional levels. Out of such 10 identified Regional Resource Agencies, 8 are NGOs. Thus the main thrust of the Campaign is being carried forward by a whole range of NGOs which ensure that not only does the Campaign reach the remotest corners of the country but that it caters to locale specific needs of environmental awareness and conservation.

5. CENTRE FOR ENVIRONMENT EDUCATION

5.1 One of the serious draw backs in executing any environmental awareness, creating activity in India especially for children is the lack of high quality educational material. To bridge this short coming, a Centre for Environment Education (CEE) has been set up at Nehru Foundation for Development, Ahmedabad (Gujarat) - an NGO. The CEE is an NGO and besides producing high quality educational material, the Centre is engaged in establishing a meaningful link between schools, NGOs, Government departments, extension agencies, etc., to develop appropriate educational material for creating environment awareness. Besides developing many educational modules, guide books, hand books, etc., both for teachers as well as students, the Centre also organises nation-wide teacher training workshops to promote environmental awareness and its dissemination. This NGO single handedly is aiming to develop a network of 1000 schools across the country which will serve as a centre for environmental awareness generating new ideas and acting as lead schools in spreading environmental awareness to schools around them.

5.2 More recently, the Ministry has set up another centre for environment education at the C.P. Ramaswamy Iyer Foundation at Madras (Tamil Nadu) which is also an NGO.

6. CASE STUDIES

There are many examples of successful NGOs which have successfully mobilised people opinion, often forcing administration to set up enquiring committees or take even more drastic action such as closure of the offending industries, factories, etc. Few such case studies are described below' :

6.1 Kerala Sastra Sahitya Parishad (KSSP)

One of the finest examples of NGOs is the Kerala Sastra Sahitya Parishad (KSSP) with over 4000 members and 250 units across the state of Kerala. The KSSP, the well-known organisation that led the battle against the historic Silent Valley Hydro-Electric Project has been spearheading a unique peoples movement almost since 1957. Through its 'SASTRAKALAJATHA' or science march through the medium of art, the KSSP has succeeded in initiating a science movement among the people of Kerala. KSSP organises short skills by folk artists on a wide range of scientific issues related to health, education and environment to communicate complicated concepts relating to development environment, etc. Every one is aware that the beautiful Silent Valley harbouring rare, endangered and genetically rich species, was saved solely by the efforts of the KSSP, which in turn is a success of the people of Kerala as all KSSP did was to mobilise the people and provide them with the true implications of the proposed hydro-electric project. KSSP has succeded in several of its efforts only with the solid backing of the people.

6.2 Dasholi Gram Swarajya Mandal (DGSM)

Another grass-root movement that has becomer internationally known is the 'Chipko Andolan'. The group that has pioneered this movement, the Dasholi Gram Swarajya Mandal (DGSM) has been organising eco-development camps to bring together groups of social workers, students and villagers for discussion on environmental issues and for

understanding afforestation work. These camps stimulate an all round debate on the problems of economic and social development with a focus on the protection and improvement of the native eco-systems for meeting immediate household needs. This group, along with the involvement of the local people, especially the women, constantly strives to use forest resources in a manner that is both environmentally and developmentally sound. In other words, while the environment is preserved, the benefits of the controlled use accrue to the local people, a process in which decentralised economic growth and ecological conservation go hand in hand.

The wide support this movement has found in the Himalayan regions, has almost stopped any felling of trees for commercial purposes. The chipko movement has not only brought forth in a dramatic manner a greatly increased understanding of the divergent interests of local people and state governments in the management of local resources, it has also emphasised that for any movement to be successful, especially in hilly regions, involvement of local women is absolutely essential.

8. THE EPILOGUE

The environmental movement in India which began in early 70s has certainly been furthered by NGOs. More than 1000 environmental NGOs are active throughout the country and the government is fully aware of the potential role that the NGOs can play in creating awareness about the environment at all levels of society. The Ministry is determined to continue the NEAC, thus strengthening the hands between the Indian government, various NGOS and other educational and professional institutions which will result in creating a very effective network spanning the entire country and capable of communicating the desired concepts to the Indian masses simultaneously.

Environmental awareness has reached a high level in India and with the involvement of more and more NGOs, suitably supported by the

government, our country's people were participate effectively in supplementing government's efforts to harmonise environmental and developmental issues.

RENRIC WORKSHOP

21st- 23rd Feb. 91

COLOMBO, SRILANKA

ENVIRONMENT AND DEVELOPMENT: BANGLADESH PERSPECTIVE

(Country Paper of Bangladesh)

By

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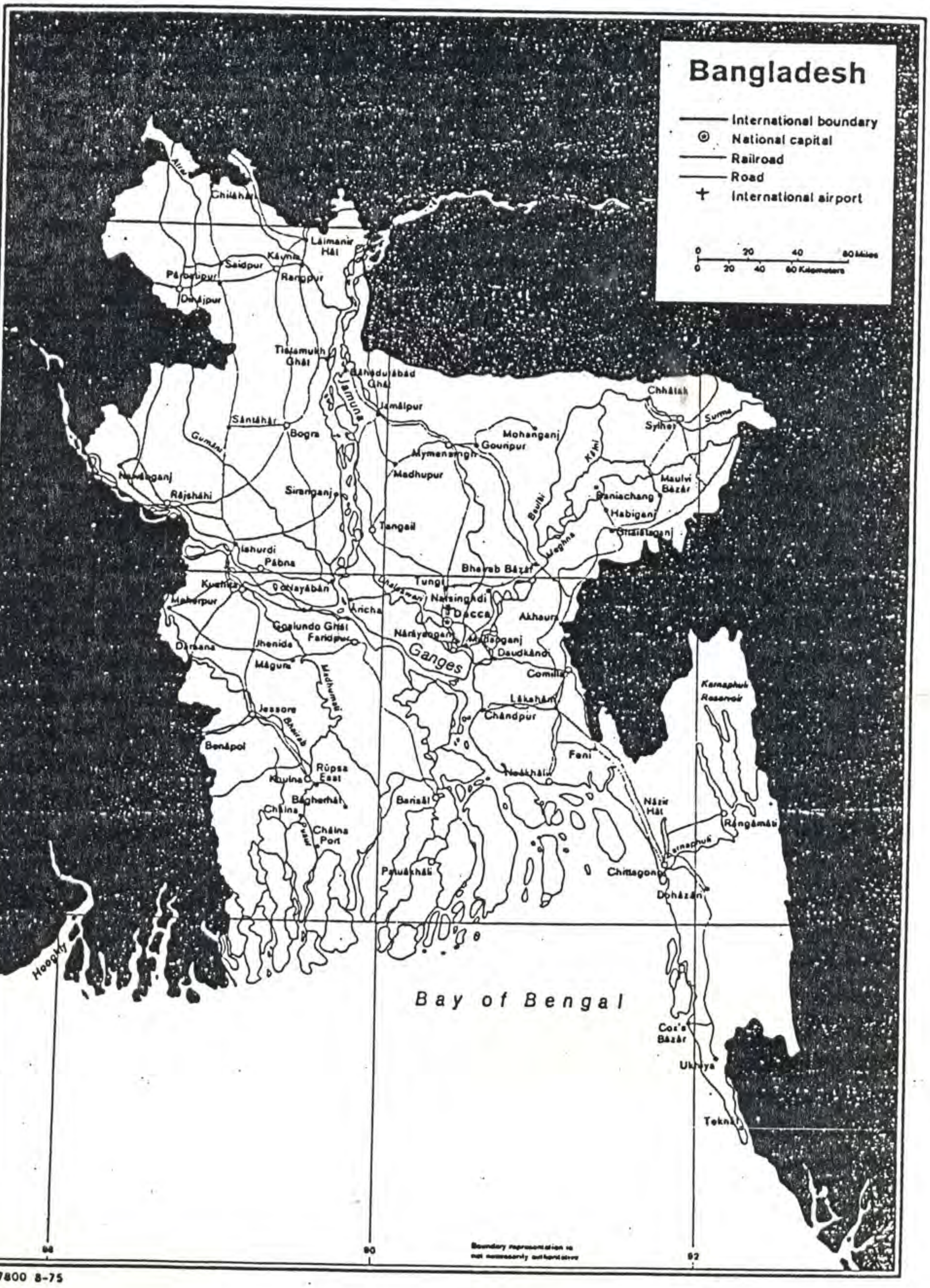
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Railroad
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Sirājganj
Jamālpur
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LIST OF ABBREVIATION

ADB	Asian Development Bank
DEPC	Department of Environment Pollution Control
DOE	Department of Environment
DPHE	Department of Public Health Engineering
ECNEC	Executive Committe of National Economic Council
EIA	Environmental Impact Assesment
EPCC	Environment Pollution Control Cell
EPCP	Environment Pollution Control Project
EPCO	Environment Pollution Control Ordinance
ESCAP	Economic & Social Commission for Asian & Pacific
FFYP	Fourth Five Year Plan
GEMS	Global Environmental Monitoring System
GOB	Government of Bangladesh
INFOTERA	International Environmental Information System
IUCN	International Union for Conservation of Nature
MOEF	Ministry of Environment and Forest
PEC	Project Evaluation Committee
SACEP	South Asian Co-operative Environmental Programme
UNEP	United Nations Environmental Programme

ENVIRONMENT & DEVELOPMENT : BANGLADESH PERSPECTIVE

1. Introduction

1.1 Life and human progress on this planet is based on nature and environment. Human activities have been producing variety of changes in the earth's environment all the time, but the innovations in science and technology and the ever increasing human needs are now causing serious threat to the natural environment and permanent damage to the earth's resource base. The scale and pace of environmental degradation have been so rapid and catastrophic in recent years that the need to save the environment has become a universal slogan and the environmental problems a global concern.

1.2 To reverse the present trends of environmental degradation, to restore and protect the earth's capacity to support life and meet human needs, are very big challenges. But it is a matter of hope and encouragement that presently there is a growing recognition throughout the world that environmentally compatible development is the real and substainable development. Bangladesh faces the difficult task of balancing between development efforts and sustaining scarce resource base.

2. General information of the country

2.1 Bangladesh a landmass of 143, 999 sq.km is situated between 20.34 and 26.38' N latitude, and 88.01' and 92.41' E longitude. It has common frontiers with two countries namely India and Burma. The country is bounded by India on the West and the North, India and Burma on the east, and the Bay of Bengal on the south with a coast-line of approximately 710 km. long. The territorial waters of Bangladesh are 12 nautical miles. The area of the high seas extending to 200 nautical miles measured from the base line constitutes the economic zone of the country.

2.2 With about half the surface below 25 contour line, the country, except some hilly areas is a large flat delta plain crisscrossed by many rivers big and small. The landmark is built over the years by deposition of the sediments through mainly by the three big rivers viz. The Ganges and the Brahmaputra originating in the Himalayan mountains and Meghna originating in khashia-Jainta hills in the north of the country. An estimated annual sediment load of 2.4 billion tons is discharged into the Bay by all these rivers.

2.3 The climate of Bangladesh is generally described as tropical monsoon. It is characterized by cool winter, hot summer, heavy summer rainfall and occasional storms and cyclones. The cyclones often accompanied by high tidal waves inundate the coastal areas causing loss of life and property.

2.4 With a projected total population of 110 million in 1989 Bangladesh is the eighth most populous country in the world. She also belongs to the high density area on the surface of the globe, the average density being 766 per sq.km. The population of the country is predominantly rural with approximately 15% urban. The present population growth rate is 2.16% (1989-90). The percentage of literacy is very low which is around 24.

2.5 The economy of the country is predominantly agricultural. Agriculture alone contributes almost 50% to the GDP. On the other hand industry contributes about 10% to the GDP.

3. Environment : Institutional development in Bangladesh.

3.1 Environment pollution and its control, environment protection environment management, ecological balance -these are comparatively new concepts in Bangladesh. Actually till independence in 1971 and even a few years after that, the only organization directly involved with environmental aspects, to some extent were the Department of Public Health Engineering (DPHE) and municipal bodies of various towns. Under the water Pollution Control Act of 1973, pollution control activities remained confined to ground and surface water operations only. The Act set up a small unit for water pollution control comprising of 27 persons under a project called 'Water Pollution control Project' and it worked under guidance and superintendence of DPHE. The unit initiated the monitoring of stream water quality at a number of locations on nine major rivers of the country and also some tanks, ponds, canals, wells, effluent outfall/ drains etc.

3.2 In 1977,the Government of Bangladesh (GOB) promulgated "Environment Pollution Control Ordinance (EPCO) (Annex-I) which continues to be the only separate and effective legislation in respect of environment protection till now. This ordinance provided for constitution of a 16 member Environment Pollution Control Board and an Environment Pollution Control Cell (EPCC). The Board was to be the body to lay down policies for control, prevention and abatement of environmental pollution and to suggest measures for implementation of such policies. Under the cell a project named 'Environment Pollution Control Project' (EPC Project) initiated in 1977. In 1982 the cell and in 1985 part of the EPC project was transferred to revenue budget and at the recommendations of the Govt. Re-organisation Committee the Department of Environment Pollution Control (DEPC) has been working since then with a total manpower of 70. The Department has besides Head Quarters in Dhaka, four Divisional offices for four administrative divisions of Dhaka, Chittagong, Khulna and Rajshahi (Organisational chart Annex II). The Divisional offices have laboratories attached one to each, with limited equipment,

mainly to analyse different parameters of water and waste water. The Department at present does not have any official building of its own.

3.3 The Department has been renamed as Department of Environment (DOE) on newly reconstituted agency replacing the former DEPC and is placed under the newly formed Ministry of Environment and Forest(MOEF) in August, 1989. However, this should mention here that the MOEF runs with a very limited manpower, even it does not have Planning/ Environment Cell (Organogram Annex III). Of course, reorganization of the MOEF including creation of a Planning Cell in the Ministry is now under active consideration of GOB. Besides, recently GOB has agreed in principle to expand the DOE with a total manpower of 388 and already sanctioned another 98 posts in addition to the existing 70 posts so that the Department could work effectively to suit the expanded role of it.

3.4 The DOE is the national government agency responsible for environmental planning, management and monitoring, Its major responsibilities include i) Co-ordinating environmental assessment and monitoring ,ii) Undertaking certain assessment and task such as on-site surveillance of development projects and follow-up monitoring of developments to determine if environmental improvement measures are effective,iii) Preparing annual monitoring reports for submission to pertinent planning and implementing agencies ,iv) promoting environmental awareness through public information programs, v) controlling and monitoring of industrial pollution, vi) advisory, etc.

4. Legislation:

4.1 As already stated the EPCO, 1977 is the only effective law in the field of environment to-date, though there are some environment related provisions directly or indirectly in some other acts, ordinances and laws. The present environmental legislation in Bangladesh which is in force covers or tends to cover laws on the i) Control of environmental pollution ii) Protection of environmental health and iii) Conservation of natural and cultural resources. To make the law more comprehensive and the penalties more stringent a new, revised ordinance named 'Bangladesh Environment Preservation Ordinance ' is under consideration for approval. The proposed new ordinance has updated the earlier provisions in the light of experience of environmental laws in other countries and experience of Bangladesh itself. Two new laws relating to radiation control and for protection of marine environment are also under consideration of the GOB.

4.2 The other laws that specially deals other subject areas related environment protection are :-

a) Pesticide Ordinance of 1971 and Pesticide Rules, 1985 .

b) Petroleum Act, 1984:

c) Factories Act, 1965

d) Motor Vehicles Ordinance, 1939 (modified in 1983).

e) Mines Act, 1927

f) Dangerous Drug Control Order, 1982

g) Forest Act, 1927 (modified in 1989).

h) Local Government Ordinance, 1976.

i) Paurashava Ordinance, 1977.

j) Water supply and sewerage Authority Ordinance, 1963

k) Boiller Act, 1923.

l) Agriculture and Sanitary Improvement Act,1920

m) Tanks improvement Act, 1939

n) Embankment and Drainage Act. 1952

o) Explosives Act, 1984

p) Poisons Act, 1919

4.3 Some of the above mentioned laws, now in force, such as the Forest Act 1927 were inherited from the British Colonial rules, some of them were brought into force between 1947 and 1971, some have been attended after independence, as these laws were useful for the time they were enacted but don't completely answer the present day needs.

5. Policy Actions :

5.1 Environmental actions and policies in Bangladesh area no longer focusing simply on the control of pollution and the abatement of nuisances, but indeed on more positive actions directed at the improvement of the quality of life that depends on the health and viability of the natural and manmade

(g) Non-portable drinking water supply and insanitary condition

(h) Adverse impact and hazards of unregulated use of pesticides to users, neighbours, aquatic life, soil microflora, birds etc.

(i) Unhealthy working condition in factories affecting health of workers.

(j) Adulteration of food-stuffs with radio-active and toxic chemicals.

(k) Radio-active pollution of the environment.

(l) Long term effects of continuously increasing use of chemical fertilizer, pesticides, high yielding varieties of crops, unchanged cropping pattern, etc.

(m) Coastal and marine pollution oil spills and ship-breaking etc.

(n) Adverse impact of various development activites e.g. bridges, roads, railways etc.

6.2 Global Factors

(a) Green house effects due to increase in almosphieric carbon-di-oxide concentration including implications for the coastal area of Bangladesh.

(b) Excessive loss of forest and green cover resulting in changes in climate rainfall patterns.

(c) Depletion of the ozone layer from CFCs and other toxic gases.

(d) Transboundary movement of hazardous wastes and dumping into seas.

6.3 The principal areas and cause of environmental degradation have been indentified in a number of recent studies, profiles and assesments. Most of these areas are indicated in map (Annex- IV) of the "Main areas of environmental concern" as descriled in the accompanying legend, these problem areas include declining soil fertility, lowered water tables, especially on the northwest regions of Bangladesh, displacement of people from river bank erosion and siltation of river channels, and degradation of the remaining natural forests wetlands, coastal environment and fisheries resources by a combination of factors. These include

industrial pollution, urbanization poorly designed flood control, drainage and irrigation works, over cutting and clearfelling of forests, improper land use and slash and burn farming in parts of the Chittagong Hill Tracts.

7. Environment and the Forth Five year Plan (FFYP)

7.1 In order to promote, nurture, protect and expand natural resources and link all developmental activities with environment towards improving the quality of life, the following objectives will be pursued during the Fourth Five year Plan:

(a) to control and prevent environmental pollution and degradation related to soil, water and air,

(b) to promote environment-friendly activities in development areas,

(c) to preserve, protect and develop natural resource bases.

(d) to strengthen the capabilities of public and private sectors to manage environment concerns as a basic requisite for sustainable development, and

(e) to create peoples' awareness for participation in environment promotion activities.

7.2 Strategies during the Fourth Five Year Plan

In order to realize the above mentioned objectives, the following major strategies will be pursued:

(a) Identification of the environmental priorities and integrating them with the national economic and social development ~~and~~ programme/s;

(b) Indentification and designing environment norms, quality standers and enforcing them to regulate industrial, domestic and other discharges/emissions;

(c) Establishment of pollution monitoring system and monitoring network in order to obtain reliable informations and process and analyse them through using modern technology and make them available to planners and decision makers;

(d) Incorporation of Environment Impact Assesment (EIA) and cost-benefit analysis in decision making on development projects and programmers;

(e) Implementation of formal and non-formal environmental education and promotion of linkages between concerned institutions;

(f) Promotion of an environmentally acceptable sanitation and water management;

(g) Delineation of the existing ecological resource zones in the country with a view to preparing appropriate plan of action;

(h) Enhancing the institutional capacity through extending support for necessary legislation, policy formulation, development of professional expertise, installing laboratory facilities, holding training and building other infrastructures;

(i) Introduction of industrial waste permit system and inspection procedures and their effective enforcement;

(j) Involving an appropriate environment-friendly technology locally so as to ensure sustainable development and expand such promotional activities;

(k) Implemetation of rural energy saving and environmentally sustainable programmes;

(l) Undertaking massive afforestation programme all over the country as a major component of environment protection plan;

(m) Involving institutions, mass-media and NGOs in support and complement national environment action plan.

(n) Encouraging private sector and NGOs to support and complement national environment action plan;

(o) Strengthening public sector institutions and organisations with appropriate manpower and logistic facilities for effective formulation and implementation of environment action plan;

(p) Making the Ministry of Environment and Forest the focal point for consultation and guidance to ensure cordination between and within sectors having environmental bearing.

(q) Formulation of appropriate legislation with the assistance of all concerned Ministries/Divisions.

(r) Consideration of regional and international issues in preparation of the environment action plan; and

(s) Encouraging research, field studies and public debates on various environmental issues.

7.3 In order to ensure environmental protection and achieve sustainable development, the Fourth Plan accords priority to the following areas:

(a) Improvement of institutional infrastructure ;

(b) Preparation of regional environmental development plan;

(c) Development of technological capability on Environment Impact Assesment (EIA) in the country;

(d) Human Resources Development and Research Programmes;

(e) Study and preparation of action programmes for clean up of pollution prone rivers;

(f) Development of appropriate environmental quality standard in industry;

(g) Public awareness creation programme;

(h) Promotion of improved oven/stove/chula in the country;

(i) Conducting environment impact related studies;

(j) Updating existing environmental laws and formulation of new laws;

(k) Procurement of a laboratory ship for marine environment surveillance;

(l) Study of mangrove ecosystem.

7.4 To achieve the objectives of the FFYP different development projects have been identified (ANNEX- V), some of which are already under implementation. These projects mainly emphasize on providing infrastructure development facilities, laboratories and equipment,general awareness programme, technology development and some studies in the field of environment.

8. Actions undertaken:

The Government has attached high priority to act effectively towards solving the environmental problems. Introduction of environmental issues to be considered at all levels and spheres of development has been initiated to ensure environmentally sound and sustainable development. Among many other activities some important actions in this fields undertaken by the Government are as follows:-

(a) The year 1990 was declared as year of environment. Elaborate programmes were identified and observed during the year.The following decade also decleared as the Decade of Environment. Under the guidance of MOEF Department of Environment has chalked out many programmes to observe the decade.

(b) Environmental concerns have duly been recognised by the development planers and decision makers. To make development programmes environmentally sound, it has been decleared that Environment Impact Assesment(EIA) would be required for all development projects.All new projects relating to development will need environmental examination and clearance from the MOEF.

(c) Major polluting industries/establishments have been identified and remadial measures are being pursued. Establishment of new industries either in public or private sector requires the clearance of the MOEF.

(d) A National Conservation Strategy is under formulation.

(e) Programmes for creation of environmental awareness have been under taken through mass media. As a part of educational curricula, environment chapter has been introduced in school curriculam. Higher degrees are being offered on this subject.

(f) Master Plan Organisation has been established to effectively manage and improve water resources taking due consideration of environmental issues.

(g) International Institute For Environmental Studies and Disaster Management has been established.

(h) The use of fuelwood in brick burning and further cutting in forest reserves have been banned. A Forestry Master Plan is under preparation and the Forest Act of 1927 has been amended as a part of natural resource conservation programme. Massive afforestation programme has been undertaken also, which include 20 new projects of the FFYP and other ongoing

projects which will create 0.49 million acres of additional forests. Moreover, all new development projects from now on will have an afforestation/plantation component.

(i) The GOB has banned export of froglegs as a step to protect frogs which act as a natural pesticide. GOB has also band export of all kinds of birds and animals to preserve the wildlife of the country.

(j) Use of improved varieties of oven and installation of low-cost latrines and tube wells in rural areas have been undertaken.

(k) The importance of flood control hardly needs to be emphasized for the overall protection of life, resources and the environment of Bangladesh. GOB has already given top priority to flood control measures and all efforts are being made to mobilize resources at home and abroad for this purpose.

(l) Government is trying to alleviate poverty and to create more employment opportunity for its people, stressing on industrialization and urbanisation.

(m) Import of toxic waste and its recycling have been banned.

(n) The Montreal Protocol for protection of ozone layer has been ratified by the Government.

9. Priority actions :

9.1 In order to promote environmental consciousness and arrest degradation and for a better management of environmental issues in Bangladesh, to me, the following are the priority actions to be undertaken :-

(a) Development of environmental infrastructures.

(b) Development of human resources training, education, research and continued education.

(c) Poverty alleviation programmes.

(d) Continuous mass awareness programmes throughout the country.

(e) Reactivation and updating of the existing sectoral laws and enactment of appropriate legislations.

(f) Supply of logistics and equipment for control of air, water and overall environment quality.

(g) Strengthening of plannings, monitoring and assesment environment related activities.

(h) Establishment of an Environmental Data Bank in the DOE .

10. Conclusion

10.1 Environment, although has been under due consideration nationally and globally, but unplanned human actions exploitation of technology have caused environment much damage. The principle that pollution should pay has been recognised. Even then Bangladesh has committed for upkeeping an environment which is required for sustainable development. The earth which has not been inherited rather borrowed should be kept unpolluted for our progeny.

10.2 While the GOB has been trying it is almost to tackle the various problems related with environmental protection and sustainable development, the problems are vast and the resources available with GOB limited.

10.3 It is hoped that adequate technical, financial and equipment support and assistance shall be forthcoming from development partners to assist GOB in the arduous task of preserving Bangladesh environment which after all is an integral part of the Global environment affecting and being affected by the other components.

10.4 Bangladesh is presently associated closely with UNEP, SACEP,INFOTERA, ESCAP, GEMS, etc. and their activities Government strongly believes that sustainable development is possible and feasible by concerted efforts domestically, regionally and internationally, and is working towards the goal.

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GOVERNMENT OF THE PEOPLE'S REPUBLIC OF BANGLADESH

MINISTRY OF LAW AND PARLIAMENTARY AFFAIRS

NOTIFICATION

Dhaka, the 5th April, 1977.

No. 305-Pub.- The following Ordinance made by the President of the People's Republic of Bangladesh, on the 31st March, 1977, is hereby published for general information :-

THE ENVIRONMENT POLLUTION CONTROL ORDINANCE, 1977

Ordinance No. XIII of 1977

AN

ORDINANCE

to provide for the control, prevention and abatement of pollution of the environment of Bangladesh.

WHEREAS it is expedient to provide for the control, prevention and abatement of pollution of the environment of Bangladesh;

NOW, THEREFORE, in pursuance of the Proclamations of the 20th August, 1975, and the 8th November, 1975, and in exercise of all powers enabling him in that behalf, the President is pleased to make and promulgate the following Ordinance :-

1. Short title.- This Ordinance may be called the Environment Pollution Control Ordinance, 1977.

2. Definitions.- In this Ordinance, unless there is anything repugnant in the subject or context,-

(a) "Air" means the discharge into the atmosphere of foreign gases, vapours, droplets and particles or of excessive amounts of normal constitutents, such as the carbondioxide and suspended particulate matters produced by burning of fossil fuels;

(b) "Board" means the Environment Pollution Control Board constituted under section 3;

(c) "Chairman" means the Chairman of the Board;

(d) "disposal system" means a system for disposing of wastes, either by surface or underground methods, and includes sewerage systems, treatment works and disposal wells;

(e) "Director" means the Director appointed under sub-section(1) of section 7;

(f) "environment" means the surroundings consisting of air, waters, soil, food, and shelter which can support or influence the growth of life of an individual or group of individuals, including all kinds of flora and founa;

(g) "pollution" means such contamination, or other alteration of the physical, chemical or biological properties of any air, waters or soil, including change in temparature, taste, colour, turbidity, odour or any other characteristics of air, waters, soil or such discharge of any liquid, gaseous, solid, radioactive, or other substance into any air, waters, or soil as will, or is likely to, create a nuisance or render such air, waters or soil harmful, injurious, detrimental or disagreeable to public health, safety or welfare or to domestic, commercial, industrial, agricultural, recreational, or other bonafide uses, or to livestock, wild animals, bird, fish, plants or other forms of life;

(h) "Project" means any activity initiated by the Government or the Board with a view to controlling preventing and abating pollution of environment or gathering information and conducting researches for the said purposes;

(i) "sewerage system" means pipe lines or conduits, pumping station, and force mains, and all other structures, devices, appurtenances and facilities used for collecting or conducting wastes to an ultimate point for treatment or disposal;

(j) "treatment works" means any plant or other works used for the purpose of treating, stabilising or holding wastes;

(k) "wastes" means sanitary sewage, industrial, discharges and all other liquid, gaseous, solid, radioactive or other substances which may pollute or tend to pollute environment;

(l) "waters" means all waters including all streams coastal waters, tanks, lakes, ponds, reservoirs, marshes, watercourses, waterways, wells, springs, irrigation systems, drainages systems, and all other bodies or accumulation of waters, surface or underground, natural or public or private.

3. Constitution of the Board.- As soon as may be after the commencement of this Ordinance, there shall be constituted for the purposes of this Ordinance a Board to be called the Environment Pollution Control Board consisting of the following members, namely :-

(a) the Member-in-charge of Physical Planning and Housing Sector of the Planning Commission, who shall also be the Chairman of the Board;

(b) the Secretary, Local Government, Rural Development and Co-operatives Division;

(c) the Secretary, Agriculture Division;

(d) the Secretary, Ministry of Industries;

(e) the Secretary, Ministry of Home Affairs;

(f) the Secretary, Ministry of Power, Water Resources and Flood Control;

(g) the Secretary, Ministry of Public Works and Urban Development;

(h) the Secretary, Forests, Fisheries and Livestock Division;

(i) the Chief, Flood Control and Water Resources, Planning Commission

(j) the Deputy Secretary dealing with the administration of this Ordinance, Local Government, Rural Development and Co-operatives Division;

(k) the Director of Health Services;

(l) the Director of Fisheries;

(m) the Chief Engineer, Public Health Engineering;

(n) the Chief Engineer, Bangladesh Inland Water Transport Authority;

(o) one person to be nominated by the Ministry of Defence from the Bangladesh Meteorological Department ; and

(p) the Director, who shall be the Secretary of the Board.

—4. Meetings of the Board—(1) The meetings of the Board shall be held on such date and at such time and place as the Chairman may direct :

Provided that when there is any appeal to the Board under sub-section (2) of section 8, the Board shall meet wit in fifteen days from the date of such appeal.

(2) All meetings of the Board shall be presided over by the Chairman and, in his absence, by a member nominated by him.

(3) Five members of the Board shall form a quorum.

(4) All matters at a meeting of the Board shall be decided by majority of the votes of the members present.

(5) Each member of the Board shall have one vote and in the event of equality of votes the Chairman shall have a casting vote.

(6) Proceedings of the meetings of the Board shall be recorded, circulated to its members within a fortnight and submitted for confirmation at next meeting.

5. Functions of the Board—(1) The Board shall—

(a) formulate policies for the control, prevention and abatement of pollution of environment;

(b) Suggest measures for the implementation of its policies.

(2) For the purpose of sub-section (1), the Board may—

(a) require any person to furnish or cause to be furnished such information as it may specify;

(b) call for report from the Director on the existing and potential problems of pollution of environment in the whole of Bangladesh or any part thereof; and

(c) appoint such expert committees as it may consider necessary.

6. Implementation Cell.—For the purpose of execution of the policies of the Board there shall be an implementation cell consisting of such officers and other employees as the Government may appoint on such terms and conditions as it may determine.

7. Director—(1) The Government shall appoint a Director for control of pollution of environment, who shall be a senior official, not below the rank of Superintending Engineer, having training, skill and experience in the control of pollution of environment on such terms and conditions as the Government may determine :

Provided that until a Director is appointed, the existing Project Director of the Water Pollution Control Project shall continue to be the Director.

(2) The Director shall be the executive head of the implementation cell and shall be responsible for implementation of the projects duly approved by the Government and the policies formulated by the Board for adopting or causing to be adopted measures suggested for it.

(3) For the purpose of sub-section (2), the Director may, by order in writing—

(a) require any person or commercial or industrial undertaking to adopt such measures, including construction, modification, extension or alteration of any disposal system, as may be specified therein for the prevention, control and abatement of existing or potential pollution of environment;

(b) require any person or commercial or industrial undertaking to furnish such information as may be specified therein relating to wastes, sewerage system or treatment works in any land or building owned or occupied by such person or undertaking; and

(c) require any person or commercial or industrial undertaking to permit any officer named therein to enter upon, inspect and search any land or building owned or occupied by such person or undertaking and to inspect and test any wastes, air, waters, soil, plants, materials or disposal system found therein and to afford all reasonable opportunities to such officer for such inspection, search and test.

(4) The Director shall under the guidance and instruction of the Chairman keep, in particular, liaison with other countries, international bodies and agencies engaged in activities relating to matters of pollution of environment.

8. Compliance with order of the Director— (1) Where the Director makes any order in writing under sub-section (3) of section 7 requiring any person or commercial or industrial undertaking to adopt any measures for the prevention, control or abatement of pollution of environment or to furnish any information or to permit any officer to enter upon, inspect or search any land or building and to inspect and test any wastes, air, waters, soil, plant materials or disposal system such person or commercial or industrial undertaking shall, subject to the provision of sub-section (2), comply with such order.

(2) Any person or commercial or industrial undertaking aggrieved by an order in writing made by the Director, under clause (a) of sub-section (3) of section 7 may, within one month from the date of the order, prefer an appeal against such order to the Board and the decision of the Board thereon shall be final.

9. Penalty and procedure— (1) Whoever fails or neglects to comply with any order of the Director or, where an appeal is preferred under sub-section (2) of section 8, with the final decision thereon of the Board shall be punishable with imprisonment for a term which may extend to one year or with fine which may extend to five thousand taka or with both, and may, in addition, be punishable with a further fine which may extend to taka twenty for every day of the period during which the failure or negligence continues.

(2) No court shall take cognizance of an offence under this ordinance except on a report in writing of the facts constituting the offence made by the Director or an officer authorised by him in this behalf.

10. Offence by commercial or industrial undertaking.— Where the person guilty of an offence under this Ordinance is a commercial or industrial undertaking, every owner, director, manager, secretary or other officer or agent thereof shall, unless he proves that he made all efforts and exercised all diligence to prevent the commission of the offence, be deemed to be guilty of such offence.

11. Indemnity.— No suit, prosecution or other legal proceedings shall lie against the Board, the Director or any other person for anything which is in good faith done or intended to be done under this Ordinance.

12. Power to make rules.— The Government may make rules for carrying out the purposes of this Ordinance.

13. Repeal and savings.— (1) The Water Pollution Control Ordinance, 1970 (E.P.Ord. V. of 1970), is hereby repealed.

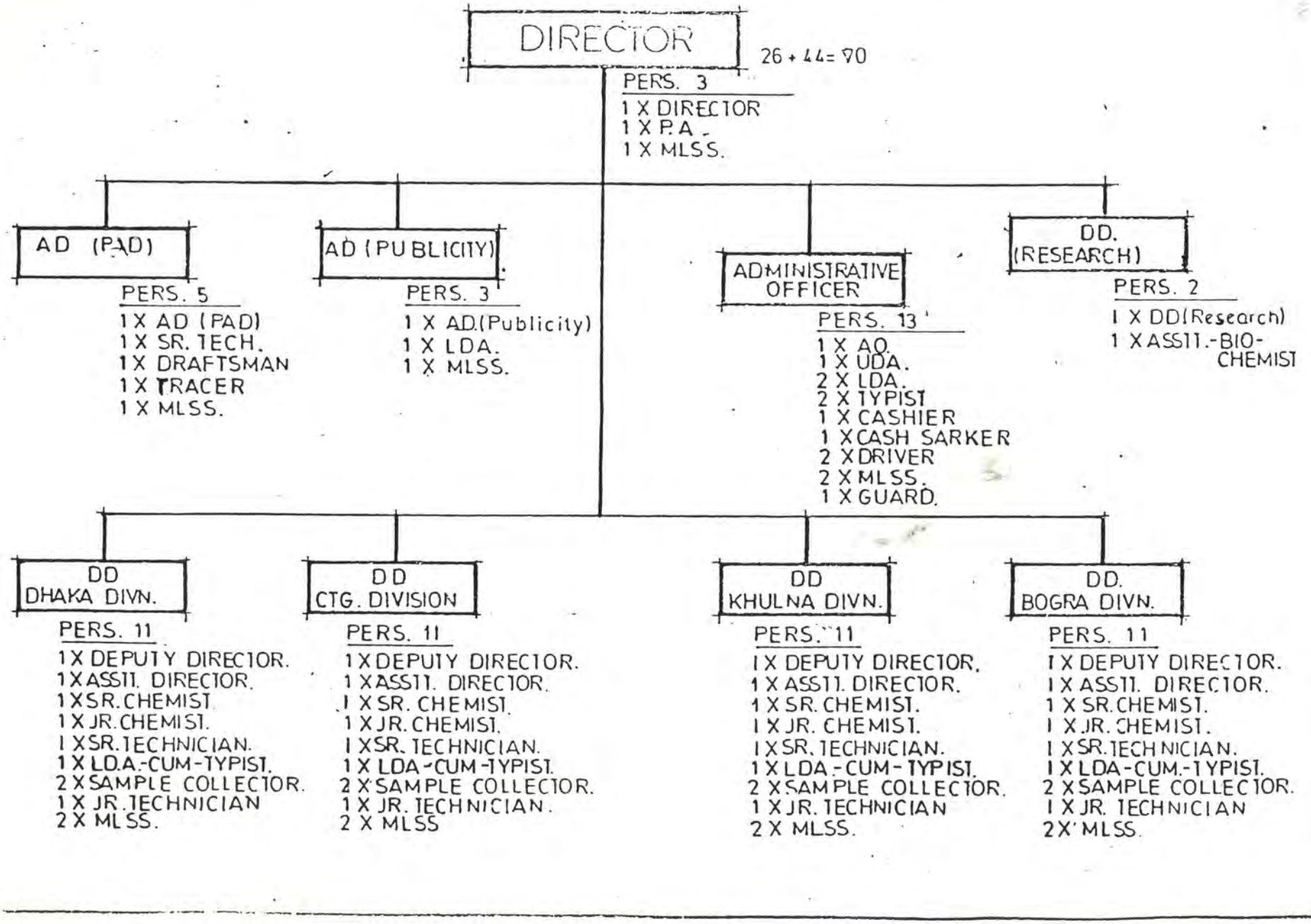
(2) Notwithstanding such repeal, anything done or any action taken or any order made under the said Ordinance, shall be deemed to have been done, taken or made, as the case may be, under the corresponding Provisions of this Ordinance.

DACCA;
The 31st March,1977,

ABUSADAT MOHAMMAD SAYEM
President.

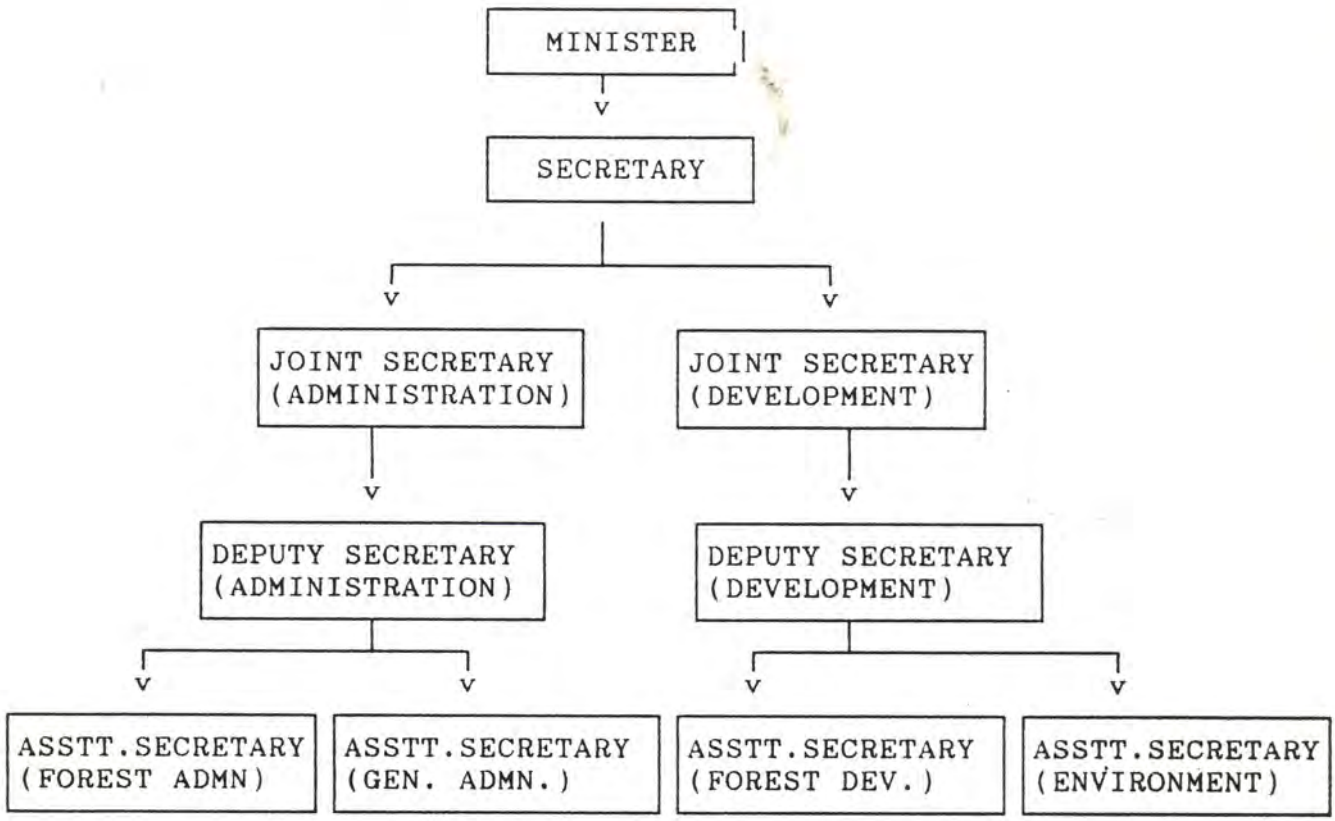
A.K. TALUKDER
Deputy Secretary

DEPTT. OF ENVIRONMENT POLLUTION CONTROL
ORGANISATIONAL CHART

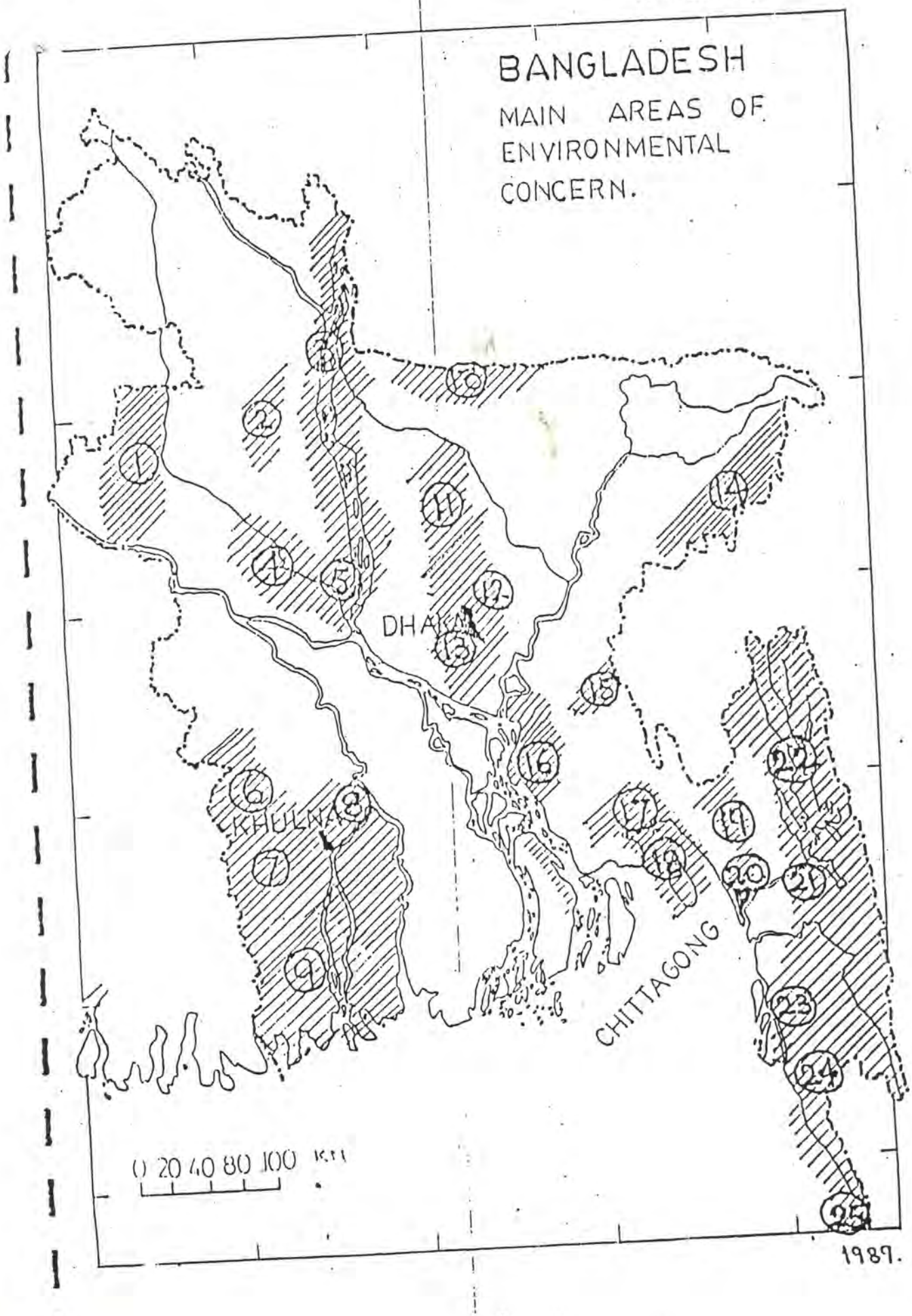


(ANNEX - III)

ORGANOGRAM OF THE MOEF



(ANNEX - IV)


BANGLADESH
MAIN AREAS OF ENVIRONMENTAL CONCERN.
DHAKA
KHULNA
CHITTAGONG
0 20 40 80 100 KM
1989.

MAIN AREAS OF ENVIRONMENTAL CONCERN

1. West- Central Barind : being dessicated through improper land-use. Low water-table and poor soils affect crop agriculture.

2. Middle Karatoa floodplain: affected by drying-up of Karatoa river. Double -cropping of HYV Rice has led to severe Sulphur & Zinc deficiencies.

3. Brahmaphtra-Jamuna floodplain: entire stretch affected by Brahmaputra Right Bank embankment, which has breached 4 out of the last 5 years. The main river may be shifting westwards. Large floating population in the char-lands. Sand-deposits after floods often ruin cultivable land.

4. Chalan Beel : One of the richest wetland areas of Bangladesh, now almost ruined by FCDI projects.

5. Atrai- Hurasagar drainage basin : due to construction of ill-conceived embankments & regulators drainage has been impeded and water-logging has become a serious problem.

6. South west Jessore: this area is climatically subject to wide variations in rainfall and temperature. Due to reduced flow in the Ganges in the dry season salinity has increased and freshwater flow has decreased.

7. Northern Khulna : large -scale shrimp farming has increased salinity and farmer conflicts and reduced rice production

8. Khulna City & Mongla town: problem area due to industrial pollution, oil spills from ships end urban congestion.

9. Sunderban : increased salinity, increasing amounts of ship oil, industrial chemicals etc. has led to the top-dying of several species of trees. There has also been overcutting of the Forest for industrial use.

10. Garo Hills Piedmont: erosion, flash floods, loss of tree cover has led to decreasing agricultural productivity.

11. Madhupur Tract : deforestation and improper use of sloping land has led to topsoil erosion.

12. Sitalakhya River : industrial plants at Ghorashal, Palash and Demra discharge toxic chemicals into this river with loss of fisheries and creation of hazard for public health.

13. Dhaka City : industrial pollution; urban expansion destroying class I agricultural land and some of the best horticultural land in the country.

14. South Sylhet : affected by deforestation, flash floods, and soil erosion.

15. Gumti basin : often damaged by flash floods.

16. Lower Meghna : affected by floods, erosion, stagnant productivity, loss of fisheries, population pressure.

17. Central Noakhali : water logging in the wet season due to impeded drainage; lack of irrigation supply in dry season due to saline groundwater. Decreasing agricultural productivity, increasing population.

18. Sandwip : thickly avily populated island being eroded rapidly. New land formations not consolidated. Frequently affected by cyclones & surges.

19. Sitakunda Range : affected by deforestation, erosion,, loss of productivity but major source of thatching grass and therefore urgently requires Land Use planning.

20. Chittagong City & port: industrial pollution, oil spills, cutting down of hills leading to increased erosion and consequent silting of rivers.

21. Chandraghona : industrial units discharge large quantities of chemicals into Karnafuli river, destroying fisheries and posing health hazard.

22. Hill Tracts : slash & burn cultivaton (jhoom) and improper use of hill slopes by immigrants has greatly increased erosion and flooding of valleys, with consequent loss of productivity. Serious decline in tree-cover.

23. Chakaria Sunderban : a forest area totally destroyed for use as shrimp farms. Now yields are declining and soils are becoming highly acid.

24. Cox's Bazar : tropical moist forests with unique biodiversity being destroyed through clear-felling & planting operations, unchecked encroachment and illicit felling of trees.

25. Jinjira island & reef: Coral reef being destroyed through over-exploitation.

(ANNEX - V)

LIST OF PROJECT FOR THE 4TH FYP (ENVIRONMENT)

Investment Project

Name	Estimated cost Lak Tk.	Donor	Remarks
1. Improvement of Environmental Infrastructure.	812.20	ADB	ON-Going
2. Upgradation of Regional Laboratories of Deptt. of Environment.	1000.00	-	Proposed
3. Creation of Public Awareness on Environment.	500.00	-	Proposed
4. Procurement of Environmental Laboratoryship for environmental survillance in coastal area.	1000.00	-	Proposed
5. Dissemination and promotion of improved oven in the Country.	1868.53	-	Proposed

Technical assistance Projects

1. Training on Environmental management in Bangladesh.	15.02	Ford foundation	Approved
2. Project Preparatory technical assistance for industrial pollution control facilities (ph-1):	67.00	ADB	PEC recommended
3. Technical assistance for development technical capability and technology transfer on EIA in Bangladesh.	316.00	ADB	ECNEC recommended
4. Development of environment management system through training & research.	119.00	-	Proposed
5. Regional environmental development planning.	190.00	-	Proposed

Name	Estimated cost Lak Tk.	Donor	Remarks
6. Development of appropriate industrial pollution control technology in the country.	230.00	-	Proposed
7. Study of air pollution impacts on human health.	100.00	-	Proposed
8. Scheme for pilot scale study on Residual Biocides and its effect on aquatic flora and fauna.	-	-	Proposed
9. Scheme for detailed environmental study and preparation of action plan for clean up of four rivers.	211.00	-	Proposed
10. National Conservation Strategy for Bangladesh.	156.84	IUCN	On-going
11. Industrial pollution control and environmental management.	-	ADB	Proposed

BHUTAN COUNTRY PAPER SUBMITTED TO THE RENRIC WORKSHOP ON ENVIRONMENT FROM 21 TO 23 FEB. 1991, COLOMBO, SRI-LANKA.

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CONTENT

I: Introduction and Summary

The Kingdom of Bhutan in the Eastern Himalaya is in a rare, possibly unique position among the countries presenting a report to this conference. It entered the so called "development process" very late, with great caution and with every intention of learning from the experiences of other countries.

As a result of this, Bhutan may be the only country in the world
- where enviromental planning precedes environmental degradation

- Where the principle of sustainability is firmly established in government polices and is efficiently implemented

- Where population pressure is so moderate that it does not hinder orderly planning for sustainable development

- Where external debt is manageable and does not prevent planning for sustainability and

- Where the natural resource base is largely intact.

In spite of Bhutan´s fortunate, possible unique situation, a number of problems in relation to future development trends are apparent.

- Virtually all arable land is being utilized and with a population largely dependent on this land for their livelihood, pressure for new farmland is growing and has resulted in some forest reduction.

- Some land use is unsustainable, e.g. shifting cultivation in the East and overgrazing in the North. There are also signs in other farming systems that shows that productivity is falling since the growing population makes the age old sustaining method break down.

- The population is growing and better health programs will result in lower child mortality and longer life expectancy. This population increase cannot easily be absorbed in rural or urban communities. Unless balanced by a strictly enforced family planning scheme and/or new means of livelihood not directly dependent on the land .

- Increase in animal population especially cattle and yak have lead in some areas to degradation without achieving a higher yield.

- Some existing industries, wood based, have placed demands on raw material that exceed the sustainable harvest of wood.

- Although most of the country's original forest cover is still intact, many forests are intensively exploited for cattle grazing, fodder and firewood, of non-wood forest products and building material. Some of this uses prevent natural regeneration and threaten the long-term survival of the forests.

- The road system, necessary for the development of the country causes severe erosion problems. In this geologically young and unstable country, this problem will be exacerbated with the further building of the roads.

- The numerous development projects undertaken in recent years and the many proposed projects need careful planning in relation to their environmental impact.

The government of Bhutan is determined that the development of the country must be for the long-term benefit of its people and is acutely aware that this goal requires strong forward planning of the development process. The so-called development has, in far too many countries in the third world resulted in a greatly increased number of people living under worsening conditions while the carrying capacity of the country is being reduced.

The government is aware that Bhutan has one of the highest levels of biological diversity of any country in the world and is committed to its preservation but are looking towards the world community to carry part of the financial burden in this respect.

Since the beginning of the 1970's when the five-year plans became genuine instruments for forward planning, long-term sustainability has been a deliberate policy even in cases where it has meant a reduction in the pace of economic growth. A typical example is the very restrictive commercial logging policy. In spite of the vast forests and the high demand for timber in the region, experience from other parts of the Himalayan region illustrate the difficulties in maintaining a sustainable harvesting program for the forest.

Under the present five-year plan attempts are made to decentralize decisions and to diversify and intensify economic activities. This stage is marked by the beginnings of a skilled labour force and internal migration. It is also marked by decentralization of development activities and greater popular participation.

The Planning process in Bhutan is coordinated by the Planning Commission with His Majesty the King as chairman. The main planning instruments are the five year plans. A number of sectoral plans and strategies are being formulated.

A National Environmental Committee was established in 1989, and a National Environmental Secretariat in 1990 as part of the Planning Commission. This Secretariat has the goal of strengthening the capabilities of forward planning on a sustainable basis of all sectors of the Bhutanese community to enhance awareness of sustainability in the population, to establish a framework for environmental impact assessments of new projects and policies and to formulate a National Environment Strategy for Bhutan.

Bhutan is an exception among countries by not having a Ministry of Environment. If all ministries have sustainability as a goal such a Ministry is superfluous.

A bench mark in creating nation wide understanding for and acceptance of the necessity of sustainable development for Bhutan was a workshop held in Paro in May 1990. This workshop, in which virtually all senior government officials in the country participated, adopted the very strong "Paro Resolution on Environment and Sustainable Development".

Bhutan is a country deeply rooted in Buddhist culture and ethics. Respect for the balance of nature is an integral part of this culture. A basic belief is that there one should not rush through that so called transformative modernizing models of development. Eco-adaptive or ecologically sustainable, alternatives must take precedence.

Bhutan has been fortunate in its development so far. The government has every intention to ensure that future development is sustainable. It is aware, however that major problems lie ahead.

The next decade will indicate whether the government has succeeded in establishing a truly sustainable development process for the long term benefits of its people which could also serve as a model for other countries in the "Third World".

II: COUNTRY PROFILE

The Kingdom of Bhutan is a small, landlocked country situated on the southern slopes of the Eastern Himalayas, from its highest peaks down to the Indian lowlands. The population is small and consists mainly of subsistence farmers, living on their own land. The Himalayan slopes are steep and very prone to erosion, both natural and man-induced. Agricultural land is in very short supply and only 3-9% of the land is actually cultivated. The rest of the country is still covered by its natural vegetation mainly forest.

Traditional patterns of utilization of the natural resource base.

The relationship between natural resources and the people of Bhutan have been forged within moral, cultural, politico-economic and ecological boundaries. In Bhutan, Buddhism plays a very central role in people's lives. The Buddhist culture believes in giving back to nature what has been taken away and the principle of respecting all forms of life including wildlife. Both Buddhist and pre-Buddhist (Bon and Animism) beliefs promoted a cautious attitude to the environment. The mountains, rivers, lakes, streams, rocks and soil are believed to be the domain of different spirits. Pollution and disturbance to these sites are believed to be the cause of deaths and diseases. Thus, nature conservation is an integral part of the traditional Bhutanese culture. Religion bred in people a respect for life in all its forms and their ecological niches. This constant interaction of the people with their natural environment sharpened their intuitive insight into eco-adaptive resource use strategies. The limited population further ensured a light pressure on the lands and the forests.

Specialized forms of agriculture have been developed over the centuries. These forms of agriculture cope with a extra-ordinarily rugged terrain and the harsh climate conditions. The forests and grasslands have always been used as an integral part of agriculture and animal husbandry and have been necessary to keep the fertility of the farmed soils.

Availability of water streams seems to have one of the major criteria for settlements to have come about in the past. If the stream then dried up or got diverted, people abandoned the settlements. Local institutions were also set up for monitoring and dispersing water, generally local elders met and decided the water distribution patterns.

Boundaries of grazing territories of different villages and individuals has always been well regulated. The herders moving through the territories of different villages lying on a migration route needed the permission for passage.

The process of socio-economic development in the kingdom of Bhutan began late. The country formulated its first development plan in 1961. The main emphasis in the country's initial plans was the establishment of basic infrastructure and the development of human resources, mainly roads and education. Bhutan has not followed a single minded apprach to economic growth but has approached development cautiously. It has maintained that the preservation of her culture, religion and the environment must go hand in hand with socio-economic development. Thus, Bhutan has defined a unique development policy, one that feels, as has been expressed that modernization in Bhutan should be guided by the

"Gross National Happiness" more than by the Gross National Product.

Five - Year Plan

The first and second five-year plans (1961/67), 1967/72) were totally financed by India and largely implemented with Indian administrative and technical assistance. These plans emphasized the building of basic infrastructure, first and foremost roads. From the first to the fourth five-year plan, there was a shift towards education, health and agriculture. The fourth five-year plan emphasized agriculture, industry, and forestry which accounted for 50% of the plan. The fifth and sixth plans marked a further shift towards decentralization of development planning and a concerted effort towards economic self-reliance.

Bhutan's Economy

Prior to 1961, when organized development began, there was no formal monetary institution in Bhutan and a very low level of monetarization of the economy. Traditionally most economic transactions were carried out on the basis of barter. Taxes were collected in kind. It was only through the institutionalization of the government, the established of the Finance Ministry and the expansion of trade with India that money as a means of economic transaction began and taxes were collected in cash. Then the Indian rupee was used as a currency until 1974 when the Bhutanese currency, the Ngultrum was first introduced. Since its introduction, the Ngultrum is valued at a par with the Indian Rupee and the Bhutanese price levels move closely with the Indian Rupee.

Present fiscal policies in Bhutan reflect a more expansionary stance than in recent years. The Government's fiscal balance reverted to a sizable deficit of 10% GDP in 1988/89, from a surplus of 1% in 1987/88, while the total liquidity increased by about 29%. As Bhutan has a high import dependency and a limited economic base, this could lead to difficulties in the balance of payments. The hard currency loans started with the fifth five year plan (1981-87). The amount outstanding at the end of the plan amounted to $95.5 million. While, Bhutan maintains a reserve of $73.0 million, there has also been a substantial increase in foreign loans.

The Current account deficit is more than offset by the foreign aid payments. Total aid inflows have been higher than the current account deficit and have created an overall surplus in the balance of payment. Despite the low earning capacity of hard currency, Bhutan's development has consistently benefited from a large influx of capital. Most of the funds have come as grants and the remainder have been loans at concessional rates. India

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has allowed Bhutan to run large current account deficits as well as large public sector deficits without facing the usual negative consequences. Inaddition to this, Bhutan has been receiving an increasing volume of bilateral and multilateral hard currency assistance since 1980.

Loans taken by the Government

Financial Institute	$14.941 million
World Bank	$22.201 million
KFAED (Kuwait Fund)	$27.252 million
Asian Development Bank	$38.730 million
Consortium of Banks	$22.657 million
Total	$125.781 million

Rs. 781

There is considerable uncertainty that surrounds convertible currency earnings. If the government does not follow a prudent policy of minimizing debt accumulation, it could effect the progress of development work. The debt service ratio in convertible currency rose to over 47% of export earnings. However, the rupee debt ratio remained insignificant. Today, Bhutan depends on concessional foreign loans and grants for meeting its development needs. Nevertheless, the accumulation of foreign exchange reserves by virtue of the rupee procurement for aid projects provides some breathing space to develop alternative sources of hard currency earnings.

If the present aid pattern continues in years to come, it can be expected that the steady rise of national reserves will continue to grow and reserves are likely to stay high. The ratio of debt service to total foreign exchange receipts will remain manageable.

Population

With an estimated 1.3 million people spread over a land area of 46,500 square kilometer, Bhutan enjoys a relatively sparse average population density of 28 per square kilometer. In terms of population of cultivated land, the density is far greater, at places more than 250 per square kilometer. The country's population growth is currently, with considerable uncertainty, estimated at a little over 2% per year. The target growth rate of the human population to be achieved by the end of the century is fixed at less than 2% per year. This goal will mainly rely on spacing of child birth and voluntary adoption of birth control. Bearing in mind the inverse relationship between female literacy and family size, special emphasis will be given to increase educational attainment of women.

The health situation is not good at the moment with a high child mortality and low life expectancy. The Royal Government has, however, entered into major health programs. Successful health programs will mean a substantial increase in population growth. The rapid increase of human populations will put increasing pressure on the limited physical resources of Bhutan. Therefore, achieving a slower growth rate and an environmentally balanced size of human population, and establishing non-farming employment opportunities should be the basic elements of long-term strategy for sustainability.

Continuing growth in Bhutan's population will inevitably place increased stress on the country's natural resources. We therefore, urge the Royal Government to accelerate its efforts to slow population growth and thereby preserve the balance between people and resources. No other program is so critical to a sustainable future for the nation.

Biological Diversity

Bhutan is one of the countries in the world with the greatest biological diversity i.e. the greatest number of species of animals and plants.

Bhutan is situated in the border area of two major faunal and floral regions, the palaearctic, distributed in Asia north of the Himalayas and further west, and the Indo-Malaysian found in India and South-East Asia. This position together with the rich variation of largely unspoilt biotopes at various altitudes, and the Buddhistic respect for nature, makes it one of the biological hotspots of the world. There is not only a very large number of species, but also a large number of endemics.

Bhutan is conscious of this rich heritage. The conservation is mainly done through the sustainable development of the natural resources of the country. Human utilization, if sustainable, is fully compatible with the continuous presence and proliferation of practically all species, plants or animals.

A protected area system may be necessary as a further precaution against biological and genetical degradation, although mainly in areas where continued sustainable development of the land is not likely.

Bhutan has, nevertheless, a well developed system of protected areas, covering more than 20% of the land area, a very high percentage in comparison to other countries. The system covers the different biotopes and altitudes but the practical implementation of the protective measures is not strong.

A rich biological diversity is the common heritage of all mankind. The stewardship of the riches areas of the earth is normally bestowed upon on the lesser developed countries, countries with other more immediate priorities which they strive to meet.

It is therefore the opinion of the government that while Bhutan is fully committed to conserve its biological diversity, a significant part of the financial burden of such conservation must rest with the world community.

A modest start to share this burden is made with the establishment in late 1990 of an Enviromental Trust Fund. If this fund can reach a size so that it can cope with the substantial financial problems, the future for Bhutan's rich flora and fauna looks bright.

The Programme shall consist of the following activities

- training foresters, ecologists, natural resource managers and other environmental professionals and managers,

- Surveys of Bhutan's biological resources and development of an ecological information base,

- review of the protected area system, establishment of new protected areas and development and implementation of management plans,

- institutional support for the National Environmental Committee, Department of Forestry, Royal Society for the Protection of Nature, the Research and Nature Study Center,

- environmental Education in the schools and public awareness campaigns, and

- Projects implementing conservation and development.

Environmental Trust Fund, Memorandum of Understanding

EROSION

The Himalayas are the youngest mountains in the world, and are still rising. Slopes are therefore as steep as they can possibly be. The soil becomes heavily waterlogged during the monsoon. These factors cause the soil to be extremely prone to erosion, natural and man-induced.

Nevertheless, soil erosion is a moderate problem in Bhutan. Rainfall erosion is not serious since the vegetation cover of Bhutan is largely intact. Deforestation in parts of Southern and South - Eastern Bhutan has, however, caused substantial erosion. The steep, unstable slopes which predominate a large part of the country are very prone to erosion. Thereby, dryland cultivation on steep lands are likely to cause erosion unless bunding or terracing is carried out. In Eastern Bhutan the practice of shifting cultivation (Tsheri) has caused erosion. However, it is erosion caused by the overgrazing of livestock that is by far the most serious threat to the country's environment. Besides the severe damage caused by overgrazing, trampling by livestock on the young shoots of trees lay substantial areas bare.

The Government has recognized that soil erosion and watershed degradation is a menace to the national welfare. Subsequently, the government is attempting to arrest watershed degradation and ecological deterioration by reducing human pressure on watershed resources through co-ordinated and integrated resource management practices.

III : THE USE OF THE LAND

Bhutan has a small population living as subsistence farmers on their own land. Poor from a monetary point of view but with a sufficient and stable supply of food. Their livelihood is based on an intricate system developed over the centuries where alpine meadows, forests and farmland all contribute to the sustainability and productivity. To keep this ecological equilibrium is the goal of the government of Bhutan

Forestry

Forests cover 64% of the country's land area according to the Government statistics. Forests are essential to the ecological stability of the country as they provide a protective covering on the steeply sloping hills and mountains of the country. Most of the forests are in a natural or almost natural state although much is intensively utilized by man.

It is government policy that the forest first and foremost serve as protection against erosion and for watershed protection.

The second most important role of the forest is its role for local farmers, for grazing, collecting of fodder and firewood, building timber and non-wood products such as bamboo, medicinal plants and edible plants and animals.

Thirdly, a small but growing woodbased industrial sector is emerging.

Wood is the traditional building material of the country and has afforded the Bhutanese with large wooden houses. Fuel wood meets over 90% of the country's energy. In most parts of the country fuel wood is abundant through dead trees and shrubs but the gathering of fuel wood in towns in South and Southeastern Bhutan have damaged the forests.

The growth in population has led to the over-exploitation of the forests on the Southern edge of Bhutan. New pressure on the forests can be seen along the growing network of roads. Fires to burn off grasslands in order to obtain improved grass often results in forest fires of nearby forests. This causes further impoverishment of the forests.

The Department of Forests was established in 1952 with the original aim of harvesting the trees and earning revenue from the forests. There has since been a major shift in its priorities.

In recent years, several dozen small sawmills and two large export based plants have become an important part of the country's export. Wood export to India are estimated at Nu. 125 million in 1988 or 15-20% of merchandise export. Timber accounts for about 5% of the government revenues.

In earlier years, sawmills have led to indiscriminate logging and over-exploitation of some areas. Therefore, the Royal Government of Bhutan has nationalized logging. It is now carried out by the Bhutan Logging Corporation (BLC) which accounted for half of the available timber in 1986.

The less accessible forests of the northern parts of the country have barely been touched and have the character of primary forest.

Afforestation is a very important priority of the Forest Department 11.2000 hectares of degraded forests has been planted by the end of the Fifth Plan and 7,360 hectares during the Sixth Plan. The Department has established its won nurseries and is mainly planting local species. The Department is also encouraging community forestry and taking initiatives to create awareness of forest and environment conservation. The Department of Education has incorporated a social forestry day when all school children plant a seedling.

Animal Husbandry

The total population of livestock is estimated at 7000,000 of which about half are cattle. Poultry and pigs are quite common and yaks are found at higher altitudes. The Yak population is estimated at about 40,000 and the number predicted to grow to 130,000 by the end of a the century.

Cattle is the most important livestock in Bhutan. Cattle are owned by over 90% of rural households. They are used primarily for the production of dairy products as cheese and butter, and as drought animals. Some modest efforts have been made to bring about cross breeding in order to boost the productivity of the cattle. These efforts have met with limited success, as cross breeds require high quality feed and do not survive well at high altitudes.

Despite the fact that government statistics show that numbers of cattle in Bhutan is actually falling, the livestock population is still too high in many regions and they are causing extensive environmental damage. The cattle in Bhutan graze on open pasture land but due to the limits on such land, much grazing is also done on forest land. Some experts state that cattle grazing is one of the hazards to the forests. In Southern Bhutan, the proliferation of cattle has made it impossible to restore the land that has been cut for firewood or for commercial purposes. The Cattle not only consumes the young tree but tramples and erodes the soil which than goes off with the first heavy rainfall. Thereby, the loss of this soil does not allow the forests to restore themselves nor do they allow decent pasture land to be restored.

There is a belt of sub-alpine pasture at 3,500-5,000 meters elevation that is highly threatened since it is grazed by the cattle in the summer and the Yaks in the winter. This problem in some areas is further exacerbated by competition with wild animals, blue sheep and the mountain goats.

The total carrying capacity of pasture land alone worked out to be 49,000 livestock units. This figure gives a deficit of about 250,000 livestock units. As a result of the large numbers of livestock, feed shortage has become prevalent in all the Dzongkhags especially Tashigang, Gaylegphug, Samchi, Chirang, Mongar and Samdrupjongkhar. Available information shows that 55% of the total animal feed requirements is being met from the forests and the "Tsheri" (shifting cultivation) lands.

The Department of Animal Husbandry is conducting long-term training Programme to educate farmers on the need to keep fewer livestock while at the same time increasing the productivity of the livestock.

The improved pasture land program's aim is to reduce the need for extensive grazing areas. This programme give the farmer incentives such as, pasture seeds, fodder tree seedlings, fertilizers, and inoculants as well as technical expertise. Despite these efforts the livestock feed programme has not been impresssive. 15,000 acres of improved pastureland are intended to be developed during the current Five Year Plan, a goal that the Department is reported to be achieving. At this rate it will still take decades to reach all of Bhutan's grazing land.

The Pasture Policy is in its final drafting stages. This document will guide the country in all matters related to pasture land distribution, fodder development, grazing patterns and rights and environmental preservation. The Policy of Animal Husbandry allows 40% of the native pasture land to be scrub land, thereby, reducing the registered 1 million acres of native pasture land to 600,000 acres of land available for grazing.

The Crossbreeding programme is also an effort undertaken to minimize the livestock pressure on the environment encouraging farmers only to keep small ad manageable numbers.

A progressive fee is taxed on all cattle by the Royal Government. This serves to discourage individual households from keeping an excessively large number of cattle. To encourage farmers to use the improved pastures, the fee for improved pastures per year is nominal. The existing regulations stipulate that the maximum number of goats allowed per household if four.

Most efforts to reduce the size of Bhutan's cattle and other animals run up against a common problem; the extreme reluctance to kill any animals, an attitude that lies deep in Buddhist religion. A substantial reduction of cattle numbers could be achieved by getting rid of sick or old cows but rural people are aghast at all sorts of "culling" programs.

Agriculture

Agriculture is estimated to account for 32% of the GDP in 1988 and employs 78% of the economically active adult population. Agricultural land is in very short supply and between 3-9% according to the various sources, of the total land is actually cultivated. Farm sizes are small and are family based. There are virtually no land-less farmers. The land is quite evenly distributed and farm size by law is limited to 10 hectares. In practice, farms are rarely larger than 4 hectares.

Tsheri of shifting cultivation comprise 32% of the total cropland. This has been traditionally successful in sustaining subsistence production under a low population density. Today, this practice is causing soil erosion and leading to the degradation of forests. Attempts are being made to replace this practice with orchard cultivation, forestry or permanent pasture with controlled grazing.

IV ; DEVELOPMENT BEYOND THE FARMING SECTOR

Employment outside the farming sector is low in Bhutan. The future course of development depends on whether balance can be kept between the rural population surplus, the possibilities for employment in the growing sectors of industry and trade, and the education and training of the man-power needed in this sector. To achieve this balance is the goal of the government of Bhutan.

Urbanization

The towns and cities in Bhutan are few and small, the four largest having a population ranging from 10,000 - 50,000. However the towns are growing quite rapidly. Thus, the capital with 15% percent per year.

The townships suffer from lack of planning and lack of infrastructure, but measures are being taken to remedy this. In the large urban centers such as, Thimphu, Phuntsholing, Samdrupjongkhar, Paro, Gaylegphug and Tashigang, the government is undertaking water supply schemes. A modern sewage disposal system presently underway in Thimphu.

The sanitary conditions in the towns are appalling but with plans for solid waste disposal and proper garbage facilities, the conditions of the towns will improve.

INDUSTRIES

There is a very small industrial sector in the country. In 1986 only 18 firms had more than 50 employees. Food processing and milling accounted in 1986 for 249 of a total of 349 licensed firms, most of them very small. A few wood-based industries, a few cement plants, a calcium carbide plant and the mining of Dolomite, Gypsum and coal comprise the industrial sector.

The working environment in the industrial sector is generally of very poor standard and represents a health hazard for the workforce. There are problems of dust pollution at the cement factories. The Calcium Carbide smoke emission are very toxic. The use of smoke filters have been installed here to control the problems.

Dolomite mining is carried out by a few small companies. Due to the open-cast mining practices and the relatively small size of most of the mining companies, the number of pits have proliferated. During the monsoon season, the instances of landslides are increasing which compound the problem further. A technical solution to this problem exists but is unfeasible at this stage because of the small sizes of the mining companies. Only large scale mining can make the adoption of a more systematic and environmentally less destructive method liable.

Gypsum mines in Eastern Bhutan has created down-stream silting problems because of the mining methods used. Here too a technical solution exists but is hinged on the scale of the operation. The key problem with coal mining is the erratic nature of the coal seams. This makes it difficult to adopt any systematic mining method.

The existing mining rules do not require any consultation with the Forest Department before any licenses for prospecting, mining or quarrying are issued. This has resulted in the disappearance of the vegetative cover over large areas leased for mines and quarried, causing serious deterioration of the environment.

The export of logs is banned and the export of sawn timber is gradually being restricted to encourage the establishment of local wood processing industries and to increase the number of value-added goods in Bhutan. South-Western Bhutan is the location of the two wood-based units namely, Gedu Wood Manufacturing Corporation and the Bhutan Boards Product. The bulk of their products is exported to India and a small part to Bangladesh. The Department of Forests monitor these industries and control their logging and require that tree planting must go together with the logging.

The government of Bhutan is committed to ensure that industrial development is sustainable and on to an environmentally safe path. The government realizes the need to link environmental concerns with new ventures that are proposed in the industrial sector. Promoters of any new ventures are required to include a detailed analysis of the environmental impact of their proposal in the techno-economic feasibility studies.

However, the industrial policies show a clear incentive to emphasize energy - and resource-intensive extractive industries for export. Such industries tend to be the most environmentally damaging and it is very difficult for Bhutan to implement the strict environmental controls that they require to ensure that industrial development is sustainable.

Energy

The major source of energy has traditionally been firewood, and the consumption per capita is one of the highest in the world. It is estimated that 2.2 million cubic meters of wood is used for cooking and heating, providing 97% of the total energy consumption.

In the last 30 years, the use of petroleum has increased. Petroleum is imported through India and transported over difficult roads to reach interior areas of the Country. The use of petroleum is a drain on the country's financial resources.

A tiny amount of coal is used by a few small industries in the South.

The country's major potential source of energy is hydro-electric energy. Bhutan has a potential of 20,000 Mega-watts. The first large hydropower scheme, the Chukha project was completed in 1988 adding 336 mega-watts to the country's existing capacity of 14 megawatts of electricity. Chukha Hydel Project's output varies substantially by season. During the dry months the output is less that 100 watts. This is because Chukha was built in a narrow valley with a small reservoir, making it an essentially a run-of-river scheme.

A run- of-the-river scheme as Chukha has a minimal environmental impact. No flooding of farmland and almost no resettlement took place. There has been a major effort to protect the watershed of Chukha from deforestation. Nevertheless, there has been a significant loss of trees in the area, apparently as a result of uncontrolled logging along the roads built for dam construction.

An estimated 23,000 families are served by Chukha's power and at most a few thousand more are several by other sources, chiefly a small number of mini and micro hydro plants. Plans are also being made for the construction of Chukha phase II and III

The transmission of power and the creation of a national power grid has been responsible for some deforestation. Steps to minimize the clearing of these forests for transmission lines are being given serious thought.

A power system master plan is currently being formulated.

Transport and Communication

A national airline serves the country's only airport. A total of 8,700 passengers were carried by Druk Air in 1987.

The internal telephone system exists with 13 exchanges. Communication at the local level is done through the civil wireless stations(39) and by chipons (local runners). In 1990, an earth satellite station was completed. By 1993, a modern micro-wave system will link all the main centers in Bhutan.

The national radio station the Bhutan Broadcasting Service exists. The national newspaper the Kuensel has a weekly circulation of 8,500 as of 1988.

The construction of a roads system started only in the late 1950's. Roads are crucial for the development of the country since the only other means of transport are by foot. Today, there is a network of 2,453 kilometers of motorable black-topped roads which are linked to the Indian Roads System. Numerous feeder roads and suspension bridges have also been built. However, most of the transportation in the remote areas are by foot trails, mule trails and foot suspension bridges.

The roads were built as a remarkable engineering achievement but without proper maps and information about soil conditions.

Landslides and other erosion caused by the roads is a major problem both for communication and for forestry. It may be the largest single cause for loss of top-soil in Bhutan.

The maintenance of existing and future roads is technically difficult, expensive and labour intensive.

Bioengineering has been a successful apprach to avoid erosion and to reduce the cost of maintenance in other similar areas.

Tourism

Bhutan with its high mountains and the Buddhist culture, has always been shrouded in mystery and travellers have always been aroused by its mysticism and stunning natural beauty. The tourism sector has been an important source of hard currency earnings since the opening up of the country in 1974. However, the government has followed a strategy of limiting tourism strictly in order to avert the negative impacts of tourism.

In 1983, the Bhutan Tourism Corporation was formed as a self financing unit for the promotion of tourism and tour management.

DEVELOPMENT OF HUMAN RESOURCES

No landless farmers, very few unemployed and a stable nutritional situation is a sound base to build the future of Bhutan upon. Improved health, sanitation and educational facilities are high priorities.

To achieve the maximal "Gross National Happiness" for its people is the goal of the Government of Bhutan.

Health and Sanitation

In 1989, life expectancy in Bhutan was about 46 years for males and 49 for females. Infant mortality rate is estimated at 102 per 1000 but at over 300 per thousand in some areas. Maternal mortality is up to 7 per thousand. Respiratory tract infection and acute diarrheal and dysentery in the 0-5 years are the main causes of morbidity and mortality. Poor hygienic conditions and high prevalence of parasitic infection and contagious diseases also contribute to morbidity and mortality. Children and women make up 63% of the total population and form the largest risk group.

Significant health improvements have been made in leprosy have been significantly reduced. Special health programs such as immunization programs,malaria eradication programs, maternal and child health services have received special priority and have resulted in improved health conditions for a significant number of people. Bhutan's immunization coverage is presently the highest in South-East Asia and universal child immunization was reached in 1990. Reduction of infant mortality to 80 per 1000 by 1992 is regarded as on achieveable goal. A salt iodinization

program has removed the grave consequences of iodine deficiency. Despite these improvements in the health sector, one third of the population still do not receive adequate medical attention.

Water supply schemes to rural areas are being established in 962 villages. Despite the lack of skilled workers and necessary materials, there has been a strong sense of commitment from the various villages to install these rural water schemes which will reduce the incidence of water borne diseases and will provide a scheme for clean drinking water.

An effort is being made to install smokeless stoves in rural households. Traditional stoves fill the house with smoke causing serious eye damage and respiratory problems. They are also more wood consuming that the smokeless stoves.

EDUCATION

The government is providing free primary education and considers a priority objective to be the improvement of numerous and literacy in both Dzongkha and English. The government is very dedicated to accomplishing its goal of "education for all" by the year 2000.

The major constraints to education are the lack of skilled teachers, trained technical and administrative personnel, the lack of primary school facilities to handle the increasing demand for primary education, the difficult access to the schools and the reluctance of people in rural areas to let their children attend schools. The government is taking measures to handle these constraints and working toward their goal for universal primary education in the country.

Despite the major progress achieved since the start of the modern school system in 1961, the literacy rate is 15% still one of the lowest in the world.

INTERNATIONAL CO- OPERATION

Bhutan's development is to a higher degree than for most other countries based on co-operation with bi-lateral and multi-lateral partners. This international co-operation is essential for the development of the country. To ensure that the total result of all the projects and activities will be genuinely sustainable development is the goal of the government of Bhutan.

Bhutan became a member of the United Nations in 1971. It is also a member of the Non-Aligned Movement, the Colombo plan, the IMF, the World Bank and the Asian Development Bank.

Bhutan's two first five-year plans (1961-72) were entirely financed by India which had remained the major co-operative partner to Bhutan.

The sources of external assistance has gradually diversified during the later five-year plans, so that they now include major international lending institutions such as ADB, World Bank, Kuwait Fund and IFAD, U.N. organizations, EEC, bi-lateral donors and non governmental organizations.

Total Sixth Plan Disbursements by Donor		Million Dollars
Government of India		336
Budget Grants	134	
Project Grants	35	
Project Loan	69	
Grants of Loans	98	
Other Hard Currency Aid		177
Grants from Un Agencies	73	
Grants from other Donors	32	
Hard Currency Loans;		
ADB	19	
IDA	27	
KFAED	19	
IFAD	7	
Total		513

Source: World Bank Report, 1988

The agricultural sector has received the largest share of external assistance (29.3%, 1989) followed by education (21%) transport (14%) and health (11%)

Bhutan's development continues to benefit substantially from the co-operation with India. The Chukha Hydel Scheme which became operational in 1988 has increased Bhutan's power generating capabilities as well as its earnings from export of power. Agreement has been reached with India to build more large hydroelectric schemes. Numerous other projects, most of them in the industrial sector and the transport sector are funded by India. In addition, India has provided substantial budgetary grants and many scholarships.

Co-ordination of foreign aid is done through Round Table meetings attended by bi-lateral, multi-lateral donors, NGO´s and observers. The third Round Table meeting was held in 1988, while the fourth is scheduled for late 1991. The Third Round Table meeting concluded that:

Continued foreign aid is necessary for Bhutan, if the country is to develop. Bhutan is grateful to its donor for their sensitivity to the country´s needs and special circumstance.

Problems are, however, caused by the large number of projects. (156 excluding those funded by India are listed by UNDP for 1989), their growing complexity and inter--dependence combined with the lack of skilled manpower in Bhutan and the limited size of its civil service.

The lack of skilled manpower will often restrict the speed and quality of the practical implementation of projects and can often diminish the multiplier effect of such projects.

A heavy burden is put on Bhutan´s civil service to ensure that planned projects and activities genuinely fit into the priorities in Bhutan´s own forward planning.

All projects has consequences and repercussion beyond the project area and will influence the entire society. Such wider consequences are difficult to predict and predictions of them are not normally part of the project appraisal procedure. Such consequences are in the long run far more relevant for the development of a country than the immediate project results.

As the number of relevant projects increase and the wider implications of earlier projects become apparent, the need for strong forward planning becomes more and more necessary and demanding.

It is the intention of the Government to institutionalize Environmental Impact Assessment- in the broadest sense of the term- as a routine procedure for, in principle, all new projects and government activities. At such an early stage that the findings of such assessments can be fully utilized at the appropriate part of the planning process.

It is envisaged that the National Environmental Secretarial established under the Planning Commission will play an important role in such assessments.

GOVERNMENT OF PAKISTAN
MINISTRY OF HOUSING AND WORKS
(Environment and Urban Affairs Division)

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NATIONAL CONSERVATION STRATEGY
Of
P A K I S T A N

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NATIONAL CONSERVATION STRATEGY
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P A K I S T A N

INTRODUCTION — What is a Conservation Strategy:

Development represents the principal means of meeting human needs and improving the quality of life so that, where there is poverty and suffering, development efforts may be accelerated. But development that fails to take into account the realities of resource limitation or the fragility of essential ecological systems may be yielding scant short-term benefits at a high long-term cost. For development to succeed long-term, it must make sustainable use of natural resources. To ensure that it does so is the role of conservation. Sound conservation practice is development's long-term guarantee. How, then, to integrate conservation with the planning and implementation of conservation? The World Conservation Strategy (WCS) defines conservation as "management of human use of the biosphere so that it may yield the greatest sustainable benefits to present generations while maintaining its potential to meet the needs and aspirations of future generations." This definition introduces two concepts to conservation which demonstrate its relevance to development. First, it recognizes that development is built on a foundation of natural resources and that the judicious use of these resources to improve human welfare is among the principal objectives of development. At the same time, the WCS recognizes that the absence of development achievement is one of the important factors placing stress on the environment and making conservation's task more difficult to achieve. With the publication of the World Conservation Strategy (WCS) in 1980, conservation moved to centre stage and took up its rightful place as an essential partner of development.

WHY IS NCS NEEDED FOR PAKISTAN ?

The NCS process looks at the status of the natural resources base on which a country must base its development, examines the broad range of factors which lead to resources being used in an un-sustainable manner, and proposes ways to bring resource use into line with the capacity of these resources for renewal. Many environment/conservation issues such as over-grazing, deforestation, disposal of toxic wastes, desertification, salination, soil erosion, environmental degradation and water logging are cross-sectoral and of such complexity in scale that a single agency or level of government would face difficulties in dealing with them. There is, therefore, a need to develop an overall framework to determine which issues should have the highest priority in terms of development; how they interrelate; and where opportunities exist for making important contributions, to sustainable development. Pakistan is faced with huge environmental and developmental problems. In order to overcome these problems of great magnitude, what is needed [illegible] is a new broader pattern of well-launched sustainable development and that depends upon the conservation of natural resources. Great and lasting benefits may be gained by bringing the process of conservation and development together. In order that the whole process of NCS formulation is understood in its true perspective, it would be appropriate to have a glimpse of the environmental setting of Pakistan. Thereafter, some of the major problems of the country in the field of environment would be highlighted.

ENVIRONMENTAL SETTING OF PAKISTAN:

Emerging as an independent country in 1947, Pakistan occupies an area of about 0.8 million square kilometers. For management and administration, it has been divided into four provinces, namely Punjab, Sind, North West Frontier Province and Baluchistan; and two federally administered regions. Each province is further divided into divisions, districts, tehsils, cities and Mauzas (revenue villages). Physiographically Pakistan can be divided into three major units: the northern mountains, the western highlands and the Indus basin. The country is basically dry of the warm temperate zone. Great climatic differences prevail from the northern mountains down to the seacoast in the extreme south, but the country's general climatic character is one of aridity. The country has great diversity of bioclimates and correspondingly a great diversity of vegetation types and fauna. The major habitats for animals are the ocean, the swamps, the rivers, the lakes, the flood plains, the arid plains and the cold deserts etc. However, owing to deforestation of vast areas, followed by agriculture and overgrazing, natural habitats were destroyed and the wildlife suffered a great setback. Many animals could not survive the changes brought by man and became extinct. Some managed to escape into the adjacent habitats and became adjusted. However, many did manage to survive. Even, the present fauna of Pakistan has a representation of major natural zoological regions of the world. Pakistan is the nineth most populous country in the world. Its population was 84.25 million in 1981 which is expected to increase to 143 million by the year 2000. More than half of the country's population is in the Punjab Province, though it accounts for only a quarter of the country's area. By contrast, Baluchistan's meagre population of 4.3 million is scattered across nearly half of the area. The density is highest in the intensely irrigated north eastern corner of Punjab and in delatic region of the Indus surrounding Karachi.

PAKISTAN'S MAJOR ENVIRONMENTAL ISSUES.
POPULATION AND URBANISATION

The country's population has been increasing at an annual average rate of 3.1 % over the last 30 years. This phenomenal increase in population without corresponding expansion of basic amenities of life has exposed a majority of people to conditons which are far from satisfactory from the environmental standpoint. This can deteriorate further in the absence of a well-conceived and properly planned corrective action in the coming years. Compared to a population growth rate of 3.1%, labour force has increased at the rate of 3.2% over the last decade. The employment levels on the other hand have increased by 2.5 percent. The major factor contributing to the slow increase in employment opportunities is the use of capital intensive technology. If this trend is not reversed, the growth of employment opportunities will continue to slow down. Hence, in order to reduce unemployment and increase population carrying capacity of the economy, the informal sector needs to be encouraged. The rapid population growth and a decline in the population carrying capacity of agriculture has led to an acceleration in the growth of population in major cities. The annual average urban population growth over the past decade has been 4.4% compared to overall population growth of 3.1% over the period. Urbanization is projected to range between 56% and 62% by the year 2025. The rapid urbanization has created serious environmental problems of housing, transport and other infrastructural facilities like provision of water supply, sewerage, electricity, gas, etc.

Due to a shortage of living space, katchi-abadis or squatter settlements have mushroomed especially in big cities. These settlements have created massive health and sanitation problems.

SOIL DEGRADATION:

Pakistan is primarily an agricultural country. But there is substantial underutilization of land due to low level of intensity and of productivity. The carrying capacity of croplands seems to be under progressively increasing stress. The per capita cropped area between 1951 and 1981 declined from 0.46 to 0.31 hectares despite extension in agricultural lands. Pakistan's productivity per hectare remains one of the world's lowest. There are a number of factors which tend to reduce yeilds or productivity through soil degradation such as water and wind erosion, salinity, water logging and flooding etc. Besides, the use of pesticides has increased by 800 percent over 1980–81 to 1987–88 period. Excessive use of pesticides has resulted in damage to human and animal life. Similarly, excessive use of certain types of chemical fertilizers also has had detrimental effects on human health and ecology.

DEFORESTATION:

Pakistan's total forest area excluding private land is only 3.12 million hectares, i.e. 3.9% of total land area of 80 million hectares. The percentage is quite low as compared to a desired level of 20 to 25 percent. Over the past ten years private forests have provided 13.40 million cubic meters (78% of the total production of timber) compared to only 0.13 million cubic meters (12.7%) by the state forests. The annual production of 1.34 million cubic meters of timber falls significantly below the demand for 2.08 million cubic meters of timber in the country. The gap between supply and demand is met by imports. The supply of domestic timber is expected to increase at a rate of 1.3% and the imports are expected to increase at the rate of 4.7% to meet the future domestic demand which is projected to increase to 4.11 million cubic meters by the year 2000. The major factor behind limited forests and low output is the continuous deforestation due to increased demand for fuel wood. Pakistan is estimated to be losing forests at the rate of 1% per year which has serious consequences for environment.

DESERTIFICATION:

The livestock population of Pakistan is eighty-four million heads. A large portion of this is concentrated in the rangelands, constituting about 33 million hectares or 30 percent of the total land area of the country. This land should normally have been capable of providing forage to support bulk of this population. However, ineffective management of rangelands has led to serious environmental problems. Overgrazing of rangelands beyond their carrying capacity results in desertification. The mobility of the hards, kept by nomadic people has devastated a very large portion of Pakistan's natural pastures. Goats in particular have eliminated entire species of edible plants. The resulting desertification has become irreversible in many parts of the country. With this ecological degradation, the rangelands have not been able to sustain the growing number of animals with equal ease as before. It has been estimated that more than 60 percent of land in Pakistan is either already affected or likely to be affected by desertification.

INDUSTRIAL POLLUTION:

More than one-third of the industrial units in Pakistan may be classified as hazardous. Only 18 percent of the industrial units can be classified as producers of non hazardous waste. However, even these have the potential to become hazardous industrial units in future. There is virtually no industrial unit of Pakistan which recycles or treats its industrial wastes. Even the multinationals working in Pakistan are not treating their wastes and where they do, they are not using the standards of waste treatment of their parent countries. More than 40% of industries in Pakistan are situated in and around the periphery of Karachi, which are polluting the air and indiscriminately discharging their untreated wastes through various drains, creeks and rivers ultimately into the coastal waters. The net result is a high level of sea water pollution resulting in fish contamination among various other damages to this receiving body. The emission of untreated waste pollutes natural water bodies, canals, rivers, sea waters and the sub-soil waters are polluted. The environment is further deteriorating in the absence of any effective regulatory control. This is also reflected in the fact that the industrialists do not have the least idea of cost estimates for the installation of waste treatment systems for their units.

WATER POLLUTION:

In Pakistan water resources have been developed extensively for irrigation purposes. While the irrigation net-works have contributed to the rapid development of agriculture sector, it has also contributed to environmental degradation. The inefficient use of water by farmers, and its seepage through canals have given rise to the problems of water logging and salinity. In addition to the problems of water logging and salinity, floods are also causing environmental degradation. In Pakistan flood losses have been extensive particularly during the 1988 floods. Although dams and barrages can contain medium floods, in peak periods, they fail to do so. A number of flood control projects have been undertaken and completed during the 5th and 6th Plan periods but floods continue to pose a major threat to agriculture and to environment in Pakistan. Moreover, floods caused by torrents rushing down the hills remain a serious problem. Soil erosion, caused by deforestation – and ultimately by torrent flooding is also a serious environmental problem. It causes siltation in river beds and dams and reserviors, reducing their life span.

URBAN SOLID WASTE AND SEWAGE WASTE DISPOSAL:

Most of the sewage waste and solid waste is disposed of untreated. Since sewage is used for irrigation, the practice of releasing toxic waste into sewage lines causes serious problems for the growth of vegetables and for the users of these vegetables. No effort is being made for recycling the waste. Due to increasing use of polythene bags, the disposal is becoming increasingly difficult. While the sewage, and especially solid waste disposal, has low cost, and the dividends in terms of avoidance of diseases are rather high, it is unfortunate that sufficient amounts are not allocated for these two facilities.

AQUATIC POLLUTION:

The coastal waters of Pakistan are rich in marine resources especially fish, which are major export of the country. However, water pollution has severe effects on aquatic life. Occurrence of massive fish kill and the destruction of low aquatic forms due to indiscriminate use of pesticides in the agricultural fields along river banks and release of industrial pollutants into water bodies has become a common feature in various parts of the country. The sea waters of Pakistan are no exception. Their rich marine life is being seriously endangered by the land base pollution and the oil spills in the coastal waters. Wastes from tankers and ships are discharged in large quantities. These large quantities of pollutants have threatened the very life of marine fauna and flora. The toxicity of industrial waste discharges may be poisonous to fresh water fish and other smaller aquatic micro-organisms.

FORMULATION METHODOLOGY OF NCS:

Pakistan began to consider the importance of developing a National Conservation Strategy in 1983. In that year, the Government of Pakistan invited the International Union for Conservation of Nature and Natural Resources (IUCN) to review with it the benefits of the NCS approach. As a result of the review IUCN was invited to propose how an NCS process might best be initiated and to underline the relevance of the process to Pakistan's national planning process. The report of the IUCN mission, submitted to the Government of Pakistan in 1984, led to an agreement on the part of the Government to move ahead with the NCS. The mission report entitled "A National Conservation Strategy for Pakistan – First Steps", also attracted the attention of the development assistance community and agreement was reached with the Canadian International Development Agency (CIDA) to provide sponsorship for the first phase of work. This phase began in early 1986 and culminated in a workshop. The first phase of the project involved an extensive series of interviews with government officials, experts, leaders of NGOs, university professors and others to determine the present status of natural resources in Pakistan, probable trends for the future, and an outline for a Conservation Strategy for the country. This work culminated in a report entitled "Conservation Strategy for Sustainable Development in Pakistan: Some Key Issues" which was produced in June, 1986. The Report was reviewed by a Steering Committee comprising twelve senior experts in various aspects of conservation and development. In August, 1986, a workshop on a National Conservation Strategy for Pakistan was held in Islamabad. This workshop was the culmination of a long process of consultations between IUCN and the Government of Pakistan and, most immediately, of an intensive "first phase" of the NCS during which a wide range of people were consulted – both within and outside Government, at the Federal, Provincial and local levels. The workshop achieved a rare consensus not only on the gravity of Pakistan's environmental problems and the threat that these pose to human well-being, but also that these problems must be addressed within a framework that assures the integration of environmental concerns with the planning and management of social and economic development.

DOMESTIC ENERGY FROM RENEWABLE SOURCES

BY

DR. A N S KULASINGHE

Chairman, National Engineering & Research Development Centre

Chairman, Central Engineering Consultancy Bureau

This presentation will be made available for printing by the middle of March.

ANNEX V

REGIONAL ENVIRONMENTAL & NATURAL RESOURCES INFORMATION CENTRE

PROGRESS REPORT

July 1990 - Jan 1991

SOUTH ASIA CO-OPERATIVE ENVIRONMENT PROGRAMME

FEBRUARY 1991

REGIONAL ENVIRONMENTAL & NATURAL RESOURCES INFORMATION CENTRE

Progress Report
July 1990 -January 1991

The 'RENRIC' project has completed seven months of operation by the end of January 1991. The project implementation has encountered numerous problems as is common to the initial phase of all projects. The Senior Consultant assisted the International Consultant in the preparation of the Inception report from the 25th June to the 3rd July. The Inception Report was presented to the Asian Development Bank by the Senior Consultant. The Report was accepted by the Bank with minor alterations. These alterations were incorporated during the 3rd week of July and and was immediately couried to the ADB. I had intimation in the last week of July from the International Consultant that the Bank had accepted the corrected version and that the project could now commence its operation. During the month of July I contacted all the Focal Points informing them about the RENRIC Project, its objectives and what SACEP would expect from the Focal Points. Upto the end of July no funds were transferred to the RENRIC account due to some formalities with the Central Bank. Unfortunately the Director SACEP was on emergency leave during the preparation of the Inception Report and on his return to the island he wanted certain clarifications from the bank vis-a-vis the Inception Report including the acceptance of the Report in full by the bank due to certain altered strategies adopted in it.

I quote extracts of my report sent to Mr. Hoque, Director SACEP on the 3rd of September 1990.

QUOTE

" During the month of August we have gone through the available data in the SACEP Library. We have found that there are number of networks operating where some of the Member Countries of SACEP are participants. We have written to the following Organizations requesting them to send whatever material they have on the networks operating in the region.

ESCAP UNEP AIT FAO/RWEDP

The relevant letters are attached for your information and record.

As expected our primary difficulty in the implementation of this Project will be the obtaining of prompt replies from our Focal Points. In this context I have written personal letters to some of the Focal Point members who are known to me. I thank you for volunteering to write to the Bangladesh Focal Point on this subject. I am attaching the letters that I sent for information and record.

There were certain concerns raised by you vis-a-vis the Inception Report and in turn by the Consultative Committee on your brief to them. I have naturally withheld going full throttle in the implementation of the Project awaiting an official clearance by you and the Consultative Committee. Unfortunately the meeting due to be held on the 14th August to discuss the Inception Report has to be postponed as I and the Indian Member were not available on that day. I shall be grateful if you could arrange a meeting very early to accept the Report and commence full implementation. "

UNQUOTE

Funds were received by ADB after completion of the formalities in June but transferred to the RENRIC account in early August and the following equipment was bought on the specifications and makes recommended by the ADB in their Aid memoire.

Canon NP 3325 (Copier)
Canon AP 6300 (Word Processor)
Canon 450 (Fax)
IBM PS/2 Model 30-f31
PS/2 Monochrome Display 8503
IBM Proprinter XL24E
IBM Printer Cable
Word Perfect Ver 5.1

The ID line was installed in September. The consultative committee formally approved the Inception Report on the 28th September. The Director SACEP had received the necessary clarification confirming the Inception Report was accepted in full by the Bank. The Analyst Programmer was recruited in September. The Project was now fully operational. During the month of September we contacted the focal points for the third time giving them the approved inception report but the responses were still very poor. In the meantime we contacted and received following data from a number of institutions which would be most useful for our data network.

Institutions contacted

1) Institute of Fundamental Studies - SRI LANKA
2) University of Colombo - SRI LANKA
3) UNEP - United Nations Environment Programme - THAILAND
4) AIT - Asian Institute of Technology - THAILAND
5) ESCAP - Economic and Social Commission for Asia and the Pacific - THAILAND
6) FAO/RWEDP - Food and Agriculture Organisation/Regional Wood Energy Development Programme - THAILAND
7) UNESCO - United Nations Educational Scientific & Cultural Organization - FRANCE

Documentations received

1) Publications (26 nos.) from RWEDP, Thailand
2) Publications and pamphlets from AIT, Thailand
3) Computer diskettes of Mailing List and Bibiliographic Information Databases from RWEDP, Thailand
4) Publications from ENVIS, India
5) Publications from the Tata Energy Research Institute, India
6) Publications from the Ministry of Environment & Forests, India

Network memberships

RERIC (Regional Energy Resources Information Center) and ENSIC (Environmental Sanitation Information Center) memberships from AIT, Thailand for all 7 focal points.

In view of the fact that responses from the Focal Points were poor I in consultation with the Bank and the Director SACEP attended the ESCAP Ministerial Level Conference on Environment and Development in Asia & the Pacific held in Bangkok. One of the objectives of my attending this meeting was to meet all the Senior Officials of the Focal Points of SACEP who would attend this meeting. This was a successful meeting as SACEP & RENRIC was concerned as I was able to personally meet with the Senior Officials and discuss the modus operandi for the implementation of the Project and the benefits that would accrue to the member countries in the long run. Unfortunately Bangladesh and Afghanistan were not represented at this meeting.

I met with Dr. Bindu Lohani Acting Assistant Chief, Office of the Environment of ADB, at this meeting and impressed on him of the need to bring officials of the Focal Points for a workshop for a better understanding of this Project. He agreed to the idea. Funds from the contingency vote could be used for this workshop and that Dr. Lohani gave the necessary approval.

I contacted Mr. Goh Kiam Seng, Director & Regional Representative of Asia & the Pacific of UNEP and requested him for assistance to conduct the RENRIC Workshop and thereby renew the contacts with SACEP to which he agreed. He wanted certain details of the workshop to be discussed with Mr. Onagawa the Deputy of Mr. Goh Kiam Seng. In this context I quote a fax sent to Mr. Goh Kiam Seng.

QUOTE

" I met with Mr. Onagawa and discussed possible areas of co-operation with RENRIC/SACEP and UNEP/ROAP.

Please refer to my fax R/UNEP/90/3 of 23rd October 1990, where I have given the breakdown of the funds requested from you, viz US$ 4,378/- for the RENRIC Workshop. I had a very successful visit to India where they have consented RENRIC to use the Database available in WWF Secretariat, Development Alternatives Institutes headed by Dr. Kosla, former Director of Infoterra, TATA Engineering Research Institute and UNEP South Asia Centre of Infoterra which is housed in the Ministry of Environment and Forests.

They are proposing to send at their cost Dr. Koshoo, former Secretary of Ministry of Environment and Forests as a Resource person. Mr. Harjit Singh, Advisor to the Ministry of Environment and Forests and one other will participate at the Workshop and they have promised to present a comprehensive set of Indian experiences for discussion and adoption at the Workshop. Pakistan, Bhutan, Maldives and Sri Lanka indicated their willingness to participate at the Workshop. We are still to hear from Bangladesh and Afghanistan. The Schedule of the Workshop tentatively will be :

Day 1

09.00 - 11.00 A.M.	Inaugural Sessions
11.30 - 13.00 P.M.	Election of Office Bearers & Introductory Address by a Resource Person, either Dr. Vespry of AIT or Dr. Koshoo of India.
14.00 - 17.00 P.M.	Presentation of Indian Experiences by Mr. Harjit Singh
14.00 - 17.00 hrs.	

Day 2

08.30 - 13.00 P.M.	Presentation of Sri Lanka/Pakistan experiences
14.00 - 18.00 P.M.	Field Trip to National Engineering & Research Development Centre

Day 3

08.30 - 10.00 A.M.	Discussions of the Presentations made
10.30 - 12.00 Noon	Discussions on the future of the RENRIC Project
12.00 - 16.00 P.M.	Free
16.00 - 17.00 P.M.	Adoption of the Report

Closing session

Following institutions would participate at the Workshop.

SACEP Secretariat
Asian Development Bank - ADB
Asian Institute of Technology - AIT
United Nations Environment Programme - UNEP
UNDP Resident Representative, Sri Lanka and
A no. of Local Government and NGOs "

UNQUOTE

Responses were received from all the Focal Points contacted. It was realised that our "man power resource base" is very limited to implement in any meaningful way a network programme like that of RENRIC having very ambitious objectives. In this context I quote an extract of a letter addressed to Dr. B. N. Lohani, Acting Assistant Chief, Office of the Environment, Asian Development Bank.

QUOTE

" In my discussions with various networking arrangements I noticed that most of them were in association with a University or an Institute that has resource personnel covering different disciplines. This indeed is most convenient as an organisation such as SACEP has very limited resource capabilities. I have therefore taken the liberty to discuss with the University of Colombo a possible symbiotic association, specially the Institute of Computer Technology. Their initial responses were very favourable and they obviously wanted to know the nature of the relationship and our mutual obligations. I thought I would respond to them after discussing this with you and possibly getting some guidelines regarding the nature of our relationship, which in my opinion should be a long term relationship if this exercise should be a meaningful one. I shall be most grateful to have your reactions to this proposal. I am sending the brochures etc. of the University of Colombo and the Institute of Computer Technology.

Please find a photocopy of a fax message that I received from Director UNEP/ROAP which is self explanatory. They will bear some of the Workshop costs.

Dr. Vespry of the AIT kindly volunteered to train the RENRIC Officer assigned for data input without any charge. I have persuaded the Officer concerned to pay the travel cost and RENRIC will pay 16 days per diem at US$ 40/- the sum recommended by ADB. This will be paid from the contingency allocation in the budget. "

UNQUOTE

A very positive response was received from the ADB to the above suggestion. Discussion is now under way to arrive at a working relationship with the University of Colombo.

The Analyst Programmer of the RENRIC Project, Miss K.G.R. Kariyawasam participated in the training programme on ADVANCED MICRO CDS/ISIS Software Package (which is used for the implementation of the RENRIC databases), conducted by the Asian Institute of Technology, Thailand during month of November.

During the months of October, November and December we have conducted a complete bibiliographic search of the Focal Points under reference in the area of;

Environmental Expertise
Environmental Research and Training Institutes
Environmental Legislation

The first two items were completed while the third is in progress. Our findings were sent to the respective Focal Points for their comments and upgrading. Two documents viz Environmental Expertise and Environmental Training/Research Institutions are now published and the document on Environmental Legislation will be ready by the 20th of March.

At the invitation of the Government of India the International Consultant and I visited Delhi from the 8th to the 14th of December 1990. The following meetings were arranged.

- With Mr. Harjit Singh, Joint Secretary, Ministry of Environment & Forest.
  There were separate meetings with his staff.
- With Mr. Ashok Koshala, former Director of Infoterra, UNEP and present Chairman of Development Alternatives.
  Separate meetings were arranged with his staff.

- With Mr. Rajendra K. Pichauri, Director TATA Energy Research Institute and his staff.
- With Mr. Thomas Malhew, Secretary General, World Wide Fund for Nature, India (WWF).
- With Mr. Mahesh Prasad, Secretary to the Ministry of Environment & Forest.

The Ministry of Environment & Forest in India was most co-operative. The WWP of India, Development Alternatives, TATA Energy Research Institute and Solar Energy Society of India consented to give RENRIC access to their huge data banks collected over the year at great cost. RENRIC in consultation with the respective institutions will have to develop modalities for access to their information which will be a subject of discussion at the forthcoming Workshop. The Ministry of Environment & Forest will designate Harjit Singh, Joint Secretary/Advisor a senior professional in the field of information and communication to act as a Resource Person for the duration of the RENRIC Project. He will present two case studies at the Workshop,

viz

- The development of the anatomy of the very successful ENVIS network for possible simulation in the member countries of SACEP.
- The methodology applied in India for the balance utilization of NGO efforts.

The Ministry of Environment & Forest will allow RENRIC to use their Infoterra Data bank free of charge including the cost of postage for answering of queries. The enclosed advertisement (annex 1) will appear in Sri Lanka News papers as a first instance and in the regional papers if the responses are favourable. The Ministry of Environment & Forests consented to arrange training courses on information and communication in institutes in India if a well planned request is made to them by RENRIC.

The Honourable Minister of Environment & Parliamentary Affairs of the Government of Sri Lanka has kindly consented to appoint a very Senior Officer of the Ministry to assist in the "Collation & Collection of data" with a view to assist the RENRIC Project. I quote extract from his letter,

QUOTE

" I am sure that with some extra efforts, we could improve the performance of this and similar sub-regional projects through greater co-operation among member countries. This is also perhaps one aspect which we need to strengthen for increasing the bargaining position of South Asian countries at the forthcoming sessions of the UNCED Conference during 1992 in Brazil.

However, in regard to the Inception Report of the RENRIC Project, my Ministry will be willing to assist you and this Project in whatever way possible to make it a success. In this connection I am also herewith attaching a list of activities that we propose to launch during 1991, which will also be most relevant and useful for your Data Bank.

I am also seeking assistance from other international agencies for this purpose. With a view to supporting some of the key programmes of SACEP, I am agreeable in the first instance to assign a Senior Officer to co-ordinate the RENRIC Project activities from this end for a period of six months from 1st January, and to review its continuation after this period. "

UNQUOTE

The Project was rather inactive during the first three months due to a variety of reasons. However during the second quarter it has picked up a satisfactory momentum and the Project will have to be evaluated at the "Mid-term review meeting" due to be held in February 1991 in order to determine its future course of action.

Annex 1

INFORMATION

KEY TO DEVELOPMENT

Regional Environmental & Natural Resources Information Centre (RENRIC) a Project funded by the Asian Development Bank in collaboration with the UNEP funded INFOTERRA sub regional centre of South Asia situated in New Delhi and in association with our data bank will attempt to answer all queries on the following subject matter areas related to the environment.

ENERGY AND TRANSPORT	FOREST AND WILD LIFE
TOXIC WASTE	COASTAL MANAGEMENT
LEGAL ASPECTS	HUMAN SETTLEMENT
POLLUTION CONTROL	AGRICULTURE
URBANIZATION	POLLUTION

OR

any other in the field of environment.

This service is rendered free of charge. Please send your queries with a self addressed stamped envelope to;

DR. LESLIE HERATH - SENIOR CONSULTANT
RENRIC PROJECT
SOUTH ASIA CO-OPERATIVE ENVIRONMENT PROGRAMME
84, LORENSZ ROAD
COLOMBO 04.

Fax No. - 589369

If the queries have to be referred to the Infoterra Centre in New Delhi it would take approximately six weeks to get your answers.

ADB/SACEP Project