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**NATIONAL POLICY
FOR
INTEGRATED DEVELOPMENT
IN
THE HIMALAYAS**

**COMPUTERISED
REPORT OF THE EXPERT GROUP**



सत्यमेव जयते



**PLANNING COMMISSION
GOVT. OF INDIA
NEW DELHI**

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October 1993

(S.Z. Qasim)
Chairman,
Expert Group and
Member, Planning Commission

Acronyms Used in the Report

AIDS	- Acquired Immuno Deficiency Syndrome
CAT	- Catchment Area Treatment
CADA	- Command Area Development Agency
CPA	- Central Plan Assistance
CIMAP	- Central Indian Medicinal and Aromatic Plants
CRRI	- Central Road Research Institute
CSIR	- Council of Scientific and Industrial Research
DRDA	- District Rural Development Agency
Exp.GR	- Exponential Growth Rate
GBPIHED	- Gobind Ballabh Pant Institute of Himalayan Environment and Development
HADP	- Hill Area Development Programme
HDA	- Himalayan Development Authority
HIPA	- Himachal Pradesh Institute of Public Administration
HIV	- Human Immuno Deficiency Virus
ICAR	- Indian Council of Agricultural Research
ICDS	- Integrated Child Development Services.
ICAR-SAU	- Indian Council of Agricultural Research - State Agriculture Universities
ICFRE	- Indian Council of Forestry Research and Education.
ICMR	- Indian Council of Medical Research
ICIMOD	- International Centre for Integrated Mountain Development.
IDPL	- Indian Drug and Pharmaceutical Ltd.
IPCL	- Indian Petrochemicals Ltd.
INTACH	- Indian National Trust for Art and Cultural Heritage
IV	- Intravenous
KDMIPE	- Keshav Dev Malaviya Institute of Petroleum Exploration.
MIDC	- Meghalaya Industries Development Corporation.
NCERT	- National Council of Educational Research and Training.

NDP	- Net Domestic Product
NEHU	- North Eastern Hill University
NGO	- Non-Governmental Organisation.
NDC	- National Development Council
NGRI	- National Geophysical Research Institute
NHEDF	- National Himalayan Environment and Development Fund
ONGC	- Oil and Natural Gas Commission
RUCHI	- Rural Centre for Human Interest
SHERPA	- Society for Himalayan Environmental Rehabilitation and Peoples' Action
STD	- Sexually Transmitted Diseases
UT	- Union Territory
WIHG	- Wadia Institute of Himalayan Geology

EXECUTIVE SUMMARY

During the last two decades the problems related to harmonious socio-economic development of the Himalayas have been engaging the attention of the policy makers, planners and all those interested in the preservation of the environment. There seems to be a general agreement that the ecology of the Himalayas has been endangered, partly because of the innate feeling that the development process in the region has not adequately met the felt needs of the local population. It has been considered, in this light, that there is a need to enunciate clearly a policy for the integrated development of the region, taking a holistic view of all issues germane to the development and environmental conservation. The Planning Commission, therefore, decided to constitute an Expert Group for a comprehensive examination of the issues and suggest a policy within the framework for an integrated development consistent with the conservation of the fragile ecology of these young mountains.

The Expert Group held several meetings, some in the Himalayan States namely Himachal Pradesh, Uttar Pradesh and Meghalaya and carried out extensive discussions with a wide range of people within governmental and non-governmental agencies as well as with the individuals. The extracts from these discussions as well as with the individuals have been included as annexures to the report. The Group also referred to the previous work on this subject, the policies and plans as reflected in the past plan documents.

That the unique ecology of the Himalayas, which has such an extensive and pervasive influence on the life of our people, needs to be preserved, conserved and qualitatively upgraded is accepted by one and all. Equally, the socio-economic life and the living standards must be improved in the region. The Group has urged in the report that for the environmentally compatible development process of this region, it is necessary to ensure the value of the Himalayas as a part of the total socio-economic development of the entire country, avoiding an "Us and They" syndrome. Nevertheless, the unique character of the Himalayas calls for a regionally differentiated approach even when we look at similar kinds of problems elsewhere in the country. The report focusses on the rather special resource endowments of the area and suggests that in launching the measures for the utilisation of these resources for furthering the socio-economic conditions of the people inhabiting the area, the ecology of the area is not impaired.

That this process must be supported by effective research and studies is obvious. Several institutions have in their mandate subjects of immediate concern to the region. What appears to be lacking is an effective forum where these institutions can come together and interact to develop appropriate technologies which seek to synthesise the solutions to both environmental and developmental concerns. The need to build into this process the experience and wisdom of the local people cannot be over-emphasised, as has been brought out in this report. There has to be a wider consultation and the involvement of the common

people so that the plans of action and the programmes address themselves to their aspirations and felt needs.

The report stresses that, given the magnitude of the problems and their distinctness, it may be necessary to create an administrative mechanism for achieving a harmonious integration of environmental preservation and development and for its monitoring. The Group has recommended the setting up of a High Power Himalayan Development Authority and the creation of a Himalayan Environment & Development Fund to support the innovative actions, programmes and studies emerging from the recommendations.

The report seeks to provide an insight into the major problems of the Himalayan region as a whole and recognises that sound socio-economic development is only possible through the active participation of the people in the formulation and implementation of the plans. It is only through a process of sustainable development that poverty can be eradicated and prosperity ushered in.

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CHAPTER - I

INTRODUCTION

RATIONALE FOR CONSTITUTION OF EXPERT GROUP

1.1 From time to time the issue of the development of the Himalayas^{*} in an holistic manner, has been engaging the minds of planners, policy makers and all other interested persons. One cannot over-emphasise the importance of the Himalayas in the Indian context. In fact, these young mountains are the greatest gift of nature to the country. It is this unique mountain system that provides suitability and regularity to the Indian weather through the monsoon and has enriched India with perennial rivers and fertile lands. Like mountains, practically anywhere in the world, the Himalayas are also facing the dilemma of diminishing quality of environment, impoverishment of the resource base resulting in peoples' misery on the one hand and expectations of a much faster pace of socio-economic development on the other. The problem is far more acute in the developing countries in view of the large biotic pressure. Nature's signals in the form of floods, earthquakes, landslides etc. provide ample warning of not managing the ecosystem and for using the resources in a scientific fashion. The Himalayas not only support large population but are also crucial for those living in the plains who are directly or indirectly dependent on this mountain system for water resources, forest, minerals, energy, tourism etc. Extensive deforestation, increasing soil erosion and the large siltation of the rivers emanating therefrom are the challenges that all of us have to face. Environment and development are organically linked, complement each other and it is but necessary that a harmonious balance should be struck. It is in this context that it was decided that an Expert Group should be set up under the chairmanship of Dr. S.Z. Qasim, Member (Science and Environment) to address these problems and suggest measures to be taken for a harmonious socio-economic development and environmental conservation.

COMPOSITION OF EXPERT GROUP AND TERMS OF REFERENCE

1.2 The Planning Commission constituted an Expert Group on 27 March 1992 with the primary task of formulating a policy for the integrated development of the Himalayas. Besides Dr. Qasim, the Expert Group also included Dr. Jayant Patil, Member (Agriculture) and Dr. J.S. Bajaj, Member (Health) of Planning Commission. Several experts drawn from the premier research and development institutions in the country were also included. Copy of the order and the terms of reference are given in Annexure-I.

^{*}Some thought was given in the meeting of the Expert Group whether Himalaya (Singular) or Himalayas (Plural) should be used in the Report. Finally it was agreed that because we are including North-Eastern Region also, it would be very appropriate to use the plural form - hence "Himalayas".

OVERVIEW

Earlier Studies - Task Force headed by Dr. M.S. Swaminathan

1.3.1 The Expert Group considered the suggestions/recommendations of the Committees/Task Forces established on this subject even earlier as also the consideration of the issues relating to the Himalayan development and environment in the previous Plans. It was informed that an Eco Task Force was constituted in 1981 under the chairmanship of Dr. M.S. Swaminathan, the then Member of the Planning Commission, to look into the various issues connected with the development and preservation of the ecology of the Himalayan region. The Task Force, after a detailed examination of several aspects, particularly the process of socio-economic development and the ecological imbalances resulting therefrom, had made several recommendations. In essence it was recommended that there was a need for coordinated research on an action-oriented basis in many subjects such as post-harvest operations of agricultural commodities, transport, planning etc. The Task Force had felt that the absence of a high-level institutional infrastructure to oversee the problems of the Himalayan region in a coordinated manner was an important gap. It had also felt that even the past recommendations of the Expert Committees had not been efficaciously built into the plan formulations and had, therefore, recommended the constitution of a high level Himalayan Eco-Development Commission. In the light of the decision of the Government of India to set up a "Himalayan Eco-Development Institute", no Commission, as recommended by the Task Force, was appointed. The Expert Group took note of the fact that the Gobind Ballabh Pant Institute of Himalayan Environment and Development established as a result of the recommendations of the Task Force, under the aegis of the Ministry of Environment and Forest, has been making serious attempts at evolving coordinated action plans. Salient features of the action plan are given in Annexure-II.

STRATEGIES FOR HIMALAYAN DEVELOPMENT AS REFLECTED IN THE PREVIOUS PLANS

1.3.2 Till the beginning of the Fourth Plan there was no specific reference of any regional development plans for the Himalayas. However, a beginning was made with an outlay of Rs. 43.55 crores for special and backward areas in the Fourth Plan. It is only from the Fifth Plan onwards that a major initiative was launched for the development of hilly areas. As time elapsed, very detailed and specific strategies were contemplated for the development of hilly regions and particularly the Himalayas. Annexure-III indicates the evolution of strategies for the hill area development including the Himalayas and efforts made by the Central and State Governments in this regard. Many of these strategies and thrust areas identified have all been taken note of by the Expert Group in the finalisation of this report.

Agenda and Modalities Adopted by the Expert Group

1.3.3.1 Over the years, the Central and State Governments have taken up a number of development projects/programmes in the Himalayan region. How-

ever, in terms of access to several amenities such as education, health, transport and communication and employment opportunities, there has been a feeling that the development process has not adequately met the felt needs of the people and in terms of access, the region does not compare favourably with the others. Many other developmental projects have also been a source of major concern but environmentalists, social workers, activists and others have also commented upon in the media. An impression has also been created that the developmental projects in the Himalayan region are not being sufficiently planned with a view to maintaining the environment, being lop-sided which has resulted in causing undue destruction of the fragile ecosystem. The denudation of the hill slopes resulting in soil erosion, heavy siltation in the rivers, landslides, etc. cause serious flood problems not only in the hills but also in the plains. The Group is sensitive to these concerns.

1.3.3.2 While the issues relating to the hill area development and also the Himalayas have been discussed on several occasions even at the highest level, there has been some feeling that an institutional framework to act as a "Brain Trust" or a "Think Tank" is lacking. Moreover, what is also required is an adequate and a strong supervisory monitoring mechanism which can bring about an effective synthesis of developmental and environmental issues. The Group had decided to have extensive discussions with the concerned State Governments, environmental activists and other interested persons and institutions in undertaking the task of formulation of a National Policy for Integrated Development. The succeeding chapters reflect the labour of the Group in terms of assessment of the resources, the problems faced by the different States, the research and technology aspects, functional areas of the development process as well as the institutional arrangements.

CHAPTER-II

OVERVIEW, RESOURCES, DEVELOPMENT AND IMPACT

DESCRIPTION OF THE HIMALAYAN REGION

2.1. The Himalayas, the proverbial 'Third Pole' constitute an unique and complex system of fold mountains which are the youngest, the highest and in a class of their own containing most of the world's 'eight thousand plus' peaks, and also depict special geographical and geological features. The area known as the Himalayan ranges, was originally covered by the Tethys Sea, in the Mesozoic Era, dating back to 40 million years ago. Fossil remains belonging to Cretaceous Period (about 60-80 million years ago) are found in the Himalayan mountains. The mountain chain runs uninterrupted up to a distance of about 2800 km in length and is about 380 km in width from the west to the east. It thus covers an area of about 5,00,000 sq.km. The range stretches from the Indus and the Brahmaputra rivers encompassing the states of Jammu & Kashmir, Himachal Pradesh, North Eastern States, eight districts of Uttar Pradesh and the Darjeeling district of West Bengal. The area can be divided into four distinct zones- longitudinally (1) the Siwalik (height 900-1500 m), (2) the Outer Himalayas (1500 - 3600 m), (3) the Middle or Lesser Himalaya [height (3600-4600 m)] and (4) the Greater Himalaya (height above 6100 m). This complex mountain system consists of narrow and deep valleys, glaciers and fertile terrains.

2.1.1 The Himalayas exercise large influence on many features such as weathering, erosion, precipitation, seismicity, etc. Besides, the activities of about 200 million upland people influence the lives of innumerable numbers in the lowlands, as the perennially flowing rivers, which support several forms of life downstream, emanate from these lofty mountains. A brief survey of the Himalayan natural resources is given below.

MONSOON AND GENERAL CLIMATE

2.2.1 Aerial surveys and meteorological satellites have generated valuable information about the cloud and snow cover, output of the rivers and movement of the glaciers in the Himalayas. The climate in the Himalayan region shows large variations. On the one hand, there are cold deserts in the Trans - Himalayas and on the other hand, there are regions of very high rainfall like in Arunachal Pradesh, Meghalaya, Darjeeling district etc. In the Western part, the winter rains are more common, whereas in the Central and Eastern Himalayas maximum rain occurs during the summer. The great wall of the Himalayas plays an important role in controlling the north-ward limit and the force of the Arabian Sea branch of the monsoon. Some parts of the Himalayas are not influenced by the climatic conditions prevailing in other parts of the Himalayas such as Kashmir Valley. Here the valley is uniquely bound on all sides by high mountains thereby making the passage difficult for the moisture- laden winds to cross over the valley from the south. The rains are caused essentially by local moisture laden winds emanating from the water bodies situated in the valley.

2.2.2 The Himalayas act as a barrier passage of the cold continental air to blow from the north into the sub-continent and helps in the insulation of the Indian land-mass from the cold.

2.2.3 Large-scale and uncontrolled exploitation of natural resources especially the forest has resulted in significant modifications of micro climate at the local and regional scale with large impacts on the natural ecosystems such as forests, grasslands and water bodies. Often this has had some adverse impact on the productivity of arable land.

SOILS

2.3 The type and nature of soils vary from place to place in the Himalayas. The nature of the soil depends upon the rocks of that region, the prevailing climatic conditions, topography and the vegetation. The soils range from deep alluvial to the thin and bare soils of the high mountains and the almost desert like soils of the Trans-Himalayan region. However, the major soils found in the Himalayas are:

- (i) Himalayan Alluvial soil (ii) Red and Black soil (iii) Ferruginous Red soil (iv) Brown soil (v) Forest soil (vi) Podzolic soil (vii) Terai soil (viii) Mountain and Hill soil and (ix) High Altitude Meadow soil.

FORESTS

2.4 Forests make the most important natural resource of the Himalayas. They vary from desert type vegetation in the lower hills of Jammu to the dense semi-evergreen forests of Arunachal Pradesh and the dry Arctic-like vegetation of the Trans-Himalayas. These types of forests are controlled by various factors such as the prevailing climatic conditions, altitude, topography, latitude etc. The main forest types of the Himalayas are given in Table 1.

Table - 1

Formation-types of Forests in the Himalayas Recognized by Champion and Seth (1968)*

Formation-types of forests	Equivalent groups, subgroups and categories of Champion and Seth (1968a)
Submontane broadleaf ombrophilous forest	Northern tropical wet evergreen forests and mesic part of northern tropical semi-evergreen forests, lower part of northern subtropical broadleaved wet hill forest

Contd.....

Submontane seasonal	Drier part of semi-evergreen and broadleaf forests moist parts of the mixed deciduous forests
Submontane broadleaf summer-deciduous forests	Northern dry mixed deciduous forests and dry Siwalik sal forest, moist, mixed with deciduous forests
Low-montane needle-leaf forests with concentrated summer leaf-drop	Subtropical pine forests
Low-montane sclerophyllous evergreen broadleaf forest	Subtropical dry evergreen forests
Mid-montane broadleaf ombrophilous forests	East Himalayan wet temperate forests and higher part of northern subtropical broadleaf wet hill forests
Low to mid-montane hemi-sclerophyllous broadleaf forests with concentrated summer leaf-drop	Lower western Himalayan temperate forests and upper west Himalayan temperate forests, excluding coniferous categories and deciduous category
Mid-montane needle-leaf evergreen forests	Coniferous categories of lower western and upper west Himalayan temperate forests and east Himalayan moist temperate forests
Mid-montane winter-deciduous forests	Moist temperate deciduous forest category of lower western Himalayan temperate forests
High-montane mixed stunted forest	Subalpine forests
Very high-montane scrub	Alpine scrub

* Champion, H.G. & Seth, S.K.(1968). A revised Survey of the Forest types of India, Manager of Publication, Delhi-110006, 404 pp.

WATER

2.5 Himalayas are the vast reservoir of water in the form of snow shields, ice, glaciers from which mighty rivers like the Indus, Ganga and Brahmaputra emanate. The total ice cover is around 332,00 km i.e. 17% of the Himalayan area. By virtue of their high altitude, and their location in the path of the monsoons, the Himalayas cause the precipitation of the moisture present in most of the cloud either as snow or rain. The great rivers not only drain the southern slopes but also the northern Tibet slopes. The snow line, on the southern slopes, is at the height of 4300 m in the eastern Himalayas and 5800 m in the western Himalayas, while on the Tibetan side, the snow line is higher by about 1000m due

to the dessication caused by the absence of moisture -bearing winds. There are about 1500 glaciers. The names and sizes of some of them are: Siachin (72 km), Biafo (62 km), Baltora (61 km), Batura (58 km), Rimo (40 km), Gangotri (26 km) etc. Most of these glaciers have been retreating over a period of time as shown below:

Table : 2

Glacier Retreating rate in Himalayas

Glacier Name	Period	Years	Retreats in metres
Pindari	1845-66	121	2840)
Gangotri	1935-76	41	600) Himalaya
Barashigri	1940-63	23	1019)
Siachin	1929-58	29	914)
Kichik Kumdan	1946-58	12	1219) Karakoram
Yengutsa	1892-25	33	4134) Himalaya

2.5.1 The three major river systems - the Indus, the Ganga and the Brahmaputra rise in the Himalayan region, the Indus and Brahmaputra to the north of the chain, near the lake Mansarovar and the Ganga in the middle of the chain in the Garhwal region. People in the north-western, northern and eastern India depend on these Himalayan rivers. The total surface water potential of the three river systems has been estimated and is given below:

Table : 3

Total Surface Water potential of Himalayan rivers.

	Average Annual Flow in	
	milliard m3	million acre feet
Indus	210.0	170.0
Ganga	390.0	317.0
Brahmaputra	606.7	492.0

Power generation, irrigation, domestic and industrial water requirement and irrigation potential of the Himalayas are tremendous. The hydro - power potential of the three river systems is estimated to be of the order of 28,150 MW at 60% load factor with a break up of the Indus 6582; Ganga 11579 and Brahmaputra 9988 MW. The irrigation potential of the three river system is estimated as 35180 x 10³ hectares.

HUMAN RESOURCES

2.6 Urbanisation has created serious problems of ecological imbalances in the Himalayas. Increasing pressures of human and animal needs, rapid denudation, biotic interference in the natural regeneration process have contributed to increasing influx of humanity to urban areas. Thus, the remaining rural inhabitants have to face the problems of soil erosion, flash floods, droughts, avalanches, typhoons, storms etc. The density of the population in the urban areas gives a better basis for comparison than when the total area is considered alone.

2.6.1 It is also of much significance to note that excepting some states such as Jammu & Kashmir and Meghalaya, the urbanisation in other regions is very low. This also points to the role, tourism might have played in the urbanisation. Population distribution on the lines of urban and rural settlement is shown below:

Table : 4

Area under Forests and Agriculture, and the Human Population in different Himalayan States

State/UT	Geographical area (km ²)	Forest (%)	Net area sown in 1981 (%)	Population in (millions)	Population density (Individuals/km ²)	Rural (%)
J & K	2,22,236	61.4	15.6	5.98	26.9	78.9
Himachal Pradesh	55,673	54.8	10.8	4.28	76.9	92.4
Uttar Pradesh (8 hill districts)	51,112	28.7	15.6	4.80	95.5	80.9
Sikkim	7,299	36.0	NA	0.32	43.3	83.9
West Bengal (Darjeeling)	3,075	38.1	32.1	0.10	33.0	85.7
Assam	78,523	22.1	3.5	1.50	20.3	NA
Meghalaya	22,489	8.3	7.2	1.35	59.4	81.9
Tripura	10,477	60.1	22.9	2.05	195.9	89.0
Mizoram	21,087	62.0	1.9	0.49	23.4	75.3
Manipur	22,356	27.0	6.3	1.42	63.6	73.6
Nagaland	16,527	19.7	4.4	0.77	46.9	84.5
Arunachal Pradesh	83,573	91.3	2.0	0.63	7.6	93.4

ECOLOGICAL AND ENVIRONMENT CONSERVATION

2.7 Any safe strategy for the conservation is yet to be implemented in the Himalayas. Creation of sanctuaries, national parks and biosphere reserves for the in-situ conservation have been adopted for achieving the conservation of biodiversity. Enforcement to conserve the biodiversity for preserving the wildlife by introducing a total ban on certain types of fur, musk and rhinoceros horns has not been properly enforced. Poaching and hunting in National Parks and Sanctuaries, and, of the endangered species has to be effectively tackled. Prevention of human exploitation is difficult to implement, and therefore, for this reason alone so many national parks have been established in the Himalayas. Possibilities of ex-situ conservation must also be explored for a balanced national ecofriendly development. In certain places, however, exploitation will have to be stepped up, not only for the sake of animals but for the watershed management. Captive breeding may also be considered as a last resort for the Himalayan species. Sanctuaries such as Dachigam, Nandadevi etc. have so far played an important role in conservation.

EARTHQUAKES

2.8 The Himalayan Frontal Arc constitutes the central part of Alpidic seismic belt. Earthquake-wise, this is one of the most active intra-continental regions of the world. The northward movement of the Indian plate has caused a continental collision with an estimated rate varying from 44 to 61 mm/year and as a result the Himalayan mountain range got created. The seismic activity is the result of the continued collision between the Indian and the Eurasian plates.

2.8.1 Reliable estimates of the magnitude of earthquakes are available only for the past 90 or 100 years. As far as the Himalayas are concerned, more than a dozen earthquakes equal to or exceeding the magnitude of 7.5 have occurred in this region.

Table : 5

Occurrence and Magnitude of Earthquakes in different Himalayan regions

Date	Lat (N°)	Long (E°)	Location	Magnitude (m°)
June 12, 1897	25.9	91.8	Assam	8.7
April 4, 1905	33.0	76.0	Kangra Valley	8.6
Dec 12, 1908	26.5	97.0	N. Burma	7.5
May 23, 1912	21.0	97.0	—	8.0
July 8, 1918	24.5	91.0	Assam	7.6
Jan 27, 1931	25.6	96.0	—	7.6
Jan 12, 1934	26.5	86.5	Bihar-Nepal	8.4
May 30, 1935	29.5	66.7	Quetta	7.6
Sept 12, 1946	23.5	96.0	—	7.7
July 29, 1947	28.5	94.0	N.E. Assam	7.9
Aug 15, 1950	28.5	96.7	Assam	8.7
Nov 18, 1951	31.1	91.4	—	8.0
Aug 17, 1952	30.5	91.5	—	7.5

2.8.2 It may be noted that the area has been very active during 1897 to 1950 when four great earthquakes exceeding the magnitude 8 occurred during a short span of 53 years. These earthquakes were the Assam earthquake of 1897, the Kangra earthquake of 1905, the Bihar-Nepal earthquake of 1934 and the Assam earthquake of 1950.

2.8.3 Long term assessment of the earthquake hazard in a given region can be attempted through the development of a suitable model and by the identification of zones of possible future earthquakes. It is argued that the continental subduction along the Himalayan Frontal Arc is similar to the oceanic lithospheric subduction along the arcs, and therefore, the concept of earthquake gaps should hold good for the Himalayan region as well. In both the cases, the detachment is ruptured by great earthquakes. The Himalayan Frontal Arc have had four great earthquakes exceeding the magnitude 8 in a short span of 53 years. It is inferred that out of a total length of about 2000 km of the Himalayan Frontal Arc, some 1400 km has been broken by these 4 earthquakes and some 600 km is left to be broken in the future great earthquakes. For the period earlier than 1897, it is difficult to estimate the fracture lengths associated with 3 great earthquakes of 1885 in Kashmir, 1833 in Western Bihar and 1803 in Uttar Pradesh. It is estimated that the entire Himalayan Frontal Arc detachment gets ruptured between 180 and 240 years. The estimated repeat time of a 8 magnitude earthquake is 200 to 270 years.

Uttarkashi Earthquake of October 20, 1991

2.8.4 On October 20, 1991 a damaging earthquake occurred in the western hill region claiming several hundred human lives and causing widespread destruction. The peak ground acceleration recorded at Bhatwari and Uttarkashi accelographs was of the order of 30 g, the maximum duration of strong motion shaking with the acceleration exceeding 1 g was 40 seconds and a maximum intensity of 8+ was observed in the meizoseismal region. The epicentral area of the earthquake lies in the vicinity of the Main Central Thrust in the Uttarkashi district which is known to be a seismically active region.

Future Earthquake Scenario

2.8.5 The population density has increased several folds in the foothills of the Himalayas during the last few decades. Therefore, the number of people likely to be affected by great earthquakes has increased considerably as the constructions of houses and buildings continue to be of a poor quality. An estimate of the damage scenario in the Kangra region if the 1905 great earthquake was to be repeated today would be formidable. Keeping in view the building material and the construction, it is estimated that a total of about 1,45,400 houses will collapse completely and 2,67,800 houses will suffer severe damage. Depending upon the time of the day when the earthquake occurs, the loss of human lives would vary between 88,000 and 3,44,000. It is, therefore, essential to strengthen the important buildings to reduce hazard.

LAND SLIDES

2.9 The problem of hill side instability is very serious in the Himalayas. The Darjeeling regions of the Himalayas have recorded more than 20,000 landslides in one day in the vulnerable belts. The factors causing land slides have been found as: (i) heavy and prolonged rainfall, (ii) cutting and deep excavations on the slopes for building roads, canals and mining without appropriate debris disposal, (iii) earthquakes. Rainfall occurrence is in excess of 200 cm/year in the outer ranges. More than 44000 km length of the roads have been constructed without much consideration for the vulnerability of the region which has contributed to colossal volumes of debris and intensification of erosion. Deforestation and population pressure make the situation more grave. Control measures like stabilising the hill slopes, drainage control, vegetating the damaged slopes have been undertaken in the Himalayas, but still much remains to be done. Institutions like the Central Road Research Institute (CRRI) must come forward to look into the problem of safe road construction, particularly in the high hills. There should be a close cooperation and exchange of ideas as well as consultancy among the CRRI, Border Roads Organisation and the State Public Works Departments.

FLOODS

2.10 Two factors are critically responsible for the occurrence of floods:

- (i) the flow of water resulting from increased run-off in the catchment areas, and
- (ii) the reduction in the carrying capacity of the channels as a consequence of accumulation of sediments or obstructions of floodways built for carrying excess water.

2.10.1 The Indo-gangetic plains suffer the greatest damage in India because the lofty Himalayan mountains hold back the rain clouds from moving northwards and thus causing their precipitation in torrents. The axis of the low pressure trough lies close to the foothills resulting in heavy rainfall in the Himalayan front. In the Brahmaputra valley, vast tracts remain submerged under flood waters for about three months in a year in spite of the sufficient width of the river channel. The deposition of enormous volumes of debris at the confluences, forces the Brahmaputra currents to flow southwards, resulting in severe erosion along the south bank. Such great volumes of sediments flowing down the Himalayan rivers raise the river beds rapidly. In the north-eastern part of the Indo-Gangetic plain, most of the rivers have been changing their course resulting in considerable damages year after year. This also results in silting of the flood plains. In the deforested areas, the resultant debris, contributed by mining and road construction, spread as finer sediments on the flood plains is very poor in organic nutrients. This results in diminished productivity of the agricultural land.

2.10.2 Flood management basically requires checking the sudden excess runoff and water flow and their intensity in the drainage network. The measures taken must include reducing the runoff by increasing its infiltration into the low-lying areas and thus spreading the excess water that manages to get into the channels causing floods in the plains. Damming the rivers cannot abate flood hazards. Therefore, measures like the watersheds, construction of reservoirs, detention basins, water spreading schemes together with ground water recharge, stream channelization and flood embankments are urgently required in the Himalayan region.

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CHAPTER-III

PROBLEMS FACED BY DIFFERENT HIMALAYAN STATES

GENERAL

3.1 The Expert Group during its deliberations has identified some of the major economic and environmental problems afflicting the different Himalayan States. To have a closer perspective of the maladies and constraints, the Expert Group visited some of the Himalayan States such as Himachal Pradesh, Uttar Pradesh and North Eastern State of Meghalaya. The major specific problems, as perceived in these states are analysed below.

HIMACHAL PRADESH

3.2 The Expert Group visited Himachal Pradesh in June 1992 and held wide ranging discussions with the top officials including the Chief Minister of the state. The group also held discussions with the various groups at the grassroots level including the voluntary organisations. The issue of creating an apex body for overlooking the eco-friendly development of the hills was suggested by the Chief Minister. Such a national body or mechanism for a speedy development of this fragile region was considered very necessary. Details of this meeting are given in Annexure-V.

Plantation crops

3.2.1 It was pointed out that as per the existing directives of the Ministry of Environment and Forests (MOEF), all commercial crops are not permitted in the state. People do not have rights even for the use of trees. The tree patta scheme has been withdrawn by the Central Ministry. Denial of the usufruct to the locals has prevented a greater degree of participation of the local people in the afforestation and maintenance of trees. The State Government expressed the view that the exclusion of the areas brought under Rubber and Tea plantations by the Ministry of Environment & Forests is not correct and there is a need for the re-orientation of the various policies in such a manner that species such as mango, mulberry, guava, pine etc. may be grown in the forests. The primary focus of the various State Departments should be the plantation of trees after a thorough discussion with the local community. The State Government gave an example of their successful scheme called "Van Lagao Rozi Kamao" where the tree species were so selected that fodder is available from the leaves, fuel from the branches and furniture from the timber. The State Government also illustrated the example of the existing practice of tree plantation along the canal banks by the villagers themselves in Kinnaur and that these plantations are scrupulously guarded by the villagers themselves.

Other Issues

3.2.2 The other issues raised in the meeting were:

- Livestock (cattle), which is disproportionately high in relation to the carrying capacity of the grazing lands, leads to degradation of the land.
- Alternatives for apple packaging in synthetic materials instead of wood based packaging should be studied carefully. Major alternative such as the movement of horticulture produce in bulk, design of a national crate system, versatile enough to handle different commodities were also raised.
- There was no organised sewage system anywhere in the State. As a result, the disposal of the raw sewage into the river systems creates serious problems of gastroenteritis and other water borne diseases.
- Tourism as an industry in the state should be studied in relation to basic infrastructure which is lacking in the state for large scale tourism.

Horticulture

3.2.3 An emphasis for the need for promoting village and small industries in the horticulture region of Himachal Pradesh was also made. It was observed that Himachal Pradesh has a vast potential as regards horticulture. Improvement in marketing and cold chain facilities have to be provided for enabling the export of fruits and vegetables. It was recognised that Himachal Pradesh has a distinct advantage as regards horticulture and the same has been reflected in the apple production. Involvement of NGOs in this trade may also be encouraged as also of the self-employed youth. The twin factors namely hilly terrain and great diversity of agro-climatic conditions have affected the agro-economic system in various ways. Small-sized land holdings, cropping and farming pattern, population pressure, lack of irrigation etc., have resulted in less development of the horticulture. In recent years, forest land, hills and agricultural lands have been converted into orchards in different agro-climatic zones, with the result that an estimated 1,21,000 ha. have come under fruit crops. Off late, with the agro-technology advancements, many new high yielding varieties and many varieties of cash crops like potato, ginger and off season vegetables and a variety of seed producing vegetables were introduced. Horti-silviculture and agro-horti-silviculture represent some of the new land uses in the state. Crops like kinnow or guava are being grown in the foot-hill regions. Energy plantation of Eucalyptus are also being tried on an experimental basis. There have been scanty efforts in the improvement of alpine pasture and plantation in the cold deserts and Spiti, and a lot remains to be done.

Forests

3.2.4 In Himachal Pradesh, forests are facing immense damage. The problems arise because of making packages for crating apples. The use of wood, therefore, has tremendously affected the forests. The selection of the species

of trees has been such that the local people are not motivated for planting and nurturing them. There has been severe pressure on forests as they are the traditional energy sources of the local people. Due to soil erosion, the cover is getting reduced. The natural plains with grasses and shrubs or grasses alone give a negligible run off and the loss of soil when compared to the practice of cultivated plains is immense. The value of the forest produce (fuel, fodder, medicinal plants and timber) is massive in terms of investment in the forest sector. This again goes on without adequate environmental inputs such as soil erosion, deforestation etc. A significant flow of financial resources from the central and inter-state projects for such works as catchment area protection and rehabilitation has to be shared properly. Due to indiscriminate forest cutting, siltation rate is jeopardising the functioning of the dams in other states. Subsequently, the catchment area treatment has to be undertaken essentially in Himachal Pradesh. Adequate resources must be made available for this purpose. Degraded forests also require treatment in a systematic manner.

Livestock

3.2.5 It has been stated by the State Government that livestock and animal stock is disproportionately high in relation to the carrying capacity of grazing and pasture lands. This leads to rapid degradation of land. The practice of keeping goats should be discouraged and high quality leguminous grasses and organised grazing areas are required to be introduced. Thus both over-population of livestock and the lack of superior quality grass-lands lead to tremendous pressure on land. The dual purpose of higher breed cattle stock as a source of milk and manure is needed to be taken into account, while formulating any further measures in this regard.

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UTTAR PRADESH

3.3 During the meeting of the Expert Group in Dehradun/Mussourie in April 1993, the Government of Uttar Pradesh, apprised the Expert Group about the problems of Uttaranchal (U.P. Hills) which constitutes about 4.3% in terms of population and 17.4% in terms of the area. The Governor of the State, could not attend the meeting due to pre-occupations but very senior officers of the State, such as Shri R.S. Tolia, Secretary, Hill Area Development, Shri Pangti and the other heads of different Departments took part in the meeting. Exhaustive literature was circulated in the meeting by several Departments, detailing the constraints, problems and possible solutions for the hill development. Shri Tolia, in his opening remarks, pointed out that the hill ecosystem has degenerated with the increase in human and animal populations. Besides reserving huge tracts of land for forests and sanctuaries in the Uttar Pradesh, the hill people have started using the available land for crops without any terracing or protection against soil erosion, this is being done probably in desperation. The interests of the forest department in controlling and blocking the forests as reserves and to control the people at large seem in conflict as the people want their basic needs to be fulfilled. The following problems of the Uttar Pradesh Hills were mentioned:

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(1) degradation of environment/ecology (2) poverty (3) unemployment (4) migration of youth (5) inadequacy of essential infrastructure (6) high cost of developmental projects (7) long gestation period in the implementation of projects, as also low returns on the investment in the hills etc. Details of the meeting are given in Annexure-VI.

3.3.1 It was also pointed out that this area is under critical seismic activity and has already suffered heavy losses on account of the recent earthquake in the Uttarkashi hills.

3.3.2 An important issue raised during the meeting touched upon giving special treatment to the hill region of Uttar Pradesh like the other special category states/border states by the Central Government. According to the State representatives, the central assistance under the Border Area Development Programme during the Seventh Plan and even during the Eighth Plan has been ignored to the State. Projects on large scale soil and water conservation, watershed management, rain water harvesting, development of suitable technologies for the hills, must be funded on 100% basis by the Central Government in the hill areas.

3.3.3 Hill areas of Uttar Pradesh should be treated like the special category states of Himachal Pradesh, J&K, Assam, and Nagaland in respect of incentives, special subsidies and other facilities by the Government of India because the Uttar Pradesh Hill area is a sensitive border area and forms a part of the strategic area of the Himalayan range.

3.3.4 The present regulations of the minimum need programme (MNP) for the hill area should be modified by the Government of India because thinly and sparsely populated areas need special consideration of distance/height. These should be taken into account as the main factor for developing criteria for assistance instead of only population-based norms under the MNP.

3.3.5 Development of tourist complexes in Kausani, Pindari, Gangotri and Yamunotri etc. should be under 100 % centrally sponsored and aided schemes.

3.3.6 Electric power from conventional as well as from renewable sources of energy is required to be provided to all the population of the hill areas as early as possible to minimise the pressure on forest and arresting the fast degradation of the environment. Difficult and interior areas should be the responsibility of the Government of India for energy development, particularly for the optimal household connections and for the supply of power for the fuel needs of every household. Relaxation of power tariff for the hill areas is also a must because of the poor economic conditions of the area.

3.3.7 Uttar Pradesh is the only State in which a very large area under the forest cover has been designated as sanctuaries, national parks and biosphere reserves by the Centre. Therefore, in these areas, the question of any economic activity does not arise. The remaining forest area is not supposed

to be large enough to promote large scale activities such as apple plantation or intensive horticulture. On this account they suggested that the State of U.P. should be adequately compensated by the Centre. The size of forest area blocked for different purposes can be deduced from the figures given below in the state:

Table: 6

Area in hectares

Reserve Forests	1,87,525
Civil & Panchayat Forests	1,77,682
Total	<u>3,65,207</u>

3.3.8 Depletion of the potential natural resources such as forests, loss of vegetative cover, fertile soil and damage to the social and community assets created in the past due to geophysical and climatic hazards and continuous deteriorating environment of the hills, on the one hand, and the drain on the financial resources on account of the enforcement of the Mining Act, and the Forest Conservation Act, on the other hand, has caused difficulties in implementing the socio-economic programmes. Reduction in the avenues of the main income/revenue resources of the area accruing from the mining leases and forests have gone down. The loss of the principal source of revenue in the hills has resulted in considerable constraint of financial resources of the area and has adversely affected the per capita income of the Hill Districts. This situation has to be taken into account for supplementing the financial resources using other means. Another aspect is the meagre outlay for the forestry sector. The Seventh Plan outlay in the forestry sector was only 1.83% of the total State outlay for the hills. Considering the magnitude of the problem, this is stated to be inadequate. About 10 lakh hectares of the forest land still requires special treatment, and with the present level of financial allocations, it will certainly take a long time for its restoration.

3.3.9 Apart from this, the very high intensity of unreported disguised unemployment in the U.P. hills is, presently prevailing. Unemployment among the educated youth is increasing because the work opportunities are becoming fewer and fewer. It is estimated that about 70,000 job seekers get themselves registered in the employment exchanges every year, but the average generation of employment is only 3,000 in the organised sector annually.

NORTH-EASTERN STATES

3.4 The 5th meeting of the Expert Group was held in Shillong (Meghalaya) in May 1993. In this meeting, the Chief Minister of the State and several other Ministers of his Cabinet participated. This meeting was followed by several other meetings with the State officials in which very fruitful discussions were held. The Chief Minister also endorsed the suggestion of the constitution of a high-powered body to look into the policy issues of the integrated development of the Himalayas. Details of the meeting are given in Annexure-VII.

3.4.1 There has been tremendous development in the North-Eastern Region, in the communications of all forms, power generation and supply resulting in upgradation of social and administrative infrastructure and rapid urbanisation. For instance, the road length per 100 sq. km as on 31.3.89 in the North East stood at 32.13 km as against the All India average of 47.24 km (in 1983). The figures of road length in Assam, Nagaland and Tripura are 44.79 km, 52.21 km and 65.46 km per 100 sq km respectively. These figures are impressive if the proportion/size of the hilly terrains in the total area is taken into account. In the case of power, the North-Eastern region has now an installed capacity of 1054.21 MW as against virtually no substantial installed capacity in 1947. This has led to great progress in rural electrification. Electricity has reached most of the villages in Assam and Nagaland. Progress made in the telecom and surface transport sectors is also quite impressive.

3.4.2 In the educational field, the progress is quite noteworthy. The spread of education has resulted in the creation of a large indigenous middle class, which is manning virtually all the departments of the State Government.

3.4.3 Massive exploitation of natural resources of the region has been a dominant feature of the North-Eastern development experience. Central agencies like the ONGC, NE coal fields and other private agencies have been engaged in this task, for quite some time. These activities, initially were perceived not as a part of the development of the region but as efforts to systematically drain the region from its wealth. However, recent activities towards mining have indicated that this sector is of much economic value.

3.4.4 Agriculture sector in the North-Eastern region is also beset with problems like the extremely low level use of chemical fertilisers, low yields, failure of modern technology dissemination etc. The total consumption of fertilisers in the North East is less than that of an average agriculturally developed district of the North-West India. High Yielding Varieties (HYV), multiple cropping, crop diversification and the other more advanced agricultural practices are almost non-existent in the region and, therefore, the yield remains stagnant.

3.4.5 'Slash and Burn' leading to indiscriminate forest destruction has been prevalent in the North Eastern part of India. The tribal people, out of respect for the nature, and for its harmony were guided by their priests and leaders for burning forests on the hill-slopes in carefully regulated cycles. This is called the jhuming cycle. The jhuming cycles in the North Eastern Hills of India, according to earlier practices, had enabled the regeneration of forests before the same land was cultivated again. Initially, in the erstwhile North Eastern Frontier Agency (NEFA), the jhum cycle was as long as 25 years. In the recent past, due to disturbed ecological balance, in the North Eastern Himalayas, the jhum cycle has shrunk upto 3 to 4 years, well below the danger level. Thus, the practice has developed as a great destroyer of forests having also an adverse effect on the ecology. Assessment of the ecological danger to the Himalayan hills have been studied and condemned, while recommending alternative agricultural

techniques. But the practice persists stubbornly because the extension workers with their new techniques make little effort to understand the origin of jhuming and the advantages which are bestowed by jhuming. The essence of the jhum cultivation, literally meaning in Assamese as "Collective", is that everyone worked for self, family, village, clan and the whole India. Moreover, in the absence of other profitable alternatives, these tribal Himalayan people have no option but to rely on this sort of farming.

3.4.6 Paradoxically there has been a drastic fall in the land productivity and also in the regenerative capacity of the land, thereby upsetting the ecology of the area. The hills are denuded as the top soil is washed away, making the land impoverished. The increase in population has intensified the pressure on land as the jhum cycle becomes successively shorter, resulting in more soil erosion. The incidence of jhuming continues in about 4.6 lakh hectares involving 4.30 lakh jhumia families. Jhum control schemes taken up so far have failed to wean away the jhumias and has produced insignificant results. In Meghalaya, for instance, the estimated reduction of 10% of jhumia families could as well be due to the other factors such as migration to urban centres rather than switching over to an alternative cropping practice. There are also many instances of terraced land developed under the jhum control schemes reverting to jhum cultivation. The model land use pattern and technical package recommended by the ICAR for jhum control, does not seem to find acceptance among the locals. It is of importance to know that the recommended alternative technologies should find acceptance among the farmers, as also there should be highly efficient delivery system for providing credit/inputs and agro services and a change in the land tenure for the transformation of jhumias into settled farmers.

3.4.7 Lack of local skills, low returns on the industrial investment and shortage of unskilled labour have further compounded the malaise. The resultant scenario is characterised by low productivity and high cost of virtually every product in the north eastern region. There is a large imbalance between the development of physical and human infrastructure and the productive sector. Poor resource base in the North East, leading to investments in physical/educational infrastructure, are not designed to generate any significant source of tax revenue for the north eastern states.

3.4.8 Far too many schemes in various sectors are being replicated, based on national priorities, leading to thin spread of scarce resources. Instead, it is necessary to take stock of the assets and infrastructures available and identify the areas in which North East enjoys a clear comparative advantage over the other parts of the country. This may lead to a breakthrough in some areas and the creation of durable fiscal base. Vast and surplus hydel potential could be one of such areas. Power can develop as an industry. Sericulture, cultivation of soyabean, coal mining, uranium ore exploitation, agro-based industries etc. may ultimately give rich dividends to the States and thus increase the prosperity significantly.

3.4.9 The North East Region consists of seven states viz. Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland and Tripura. These State account for 7.7% of the total geographical area of India and are inhabited by 31.4 million people. The population distribution, especially in the hills, is sparse and the villages have small population and these are spread over long distances.

3.4.10 The States in the North East region are endowed with good hydel potential, mineral resources and have a great potential for the development of horticulture, tea, rubber, spices etc. The various development programmes for these states are being developed in such a way so as to optimally utilise the natural and human resources. After taking into account the development needs and difficult terrain of the North East Region, the Planning Commission has been liberal in fixing plan outlays for the various States from year to year. Moreover, the Annual Plans of the different States in this region are being funded predominantly through the Central assistance provided by the Planning Commission to the extent of 90% in the form of grants and 10% in the form of loans.

3.4.11 Though the region is endowed with rich natural resources, it has remained by and large under-developed in terms of per capita state domestic product, low per hectare yields of crops, low utilisation of the created irrigation potential, poor development of road network, deforestation due the adoption of peculiar cultivation practices called 'jhum' in the hills and forests; thin spread of resources due to taking up of a large number of projects and schemes.

State Domestic Product (SDP) :

3.4.12. The level of state domestic product at the current prices in 1985-86 and 1990-91 for seven States is indicated below.

State Domestic Product (at current prices)

State	1985-86	1990-91
Arunachal Pradesh	3274	4975
Assam	2313	3427
Manipur	2362	3893
Meghalaya	2250	3443
Mizoram	2658	4026 (1988-89)
Nagaland	2800	3602
Tripura	2108	3328 (1989-90)

3.4.13 An examination of the composition of SDP of the various States shows that the primary sector, (agriculture, including mining) predominates in Assam, Tripura and Arunachal Pradesh. As against this, some services such

as the construction sector predominates in Manipur, Meghalaya, Mizoram and Nagaland. The contribution of the manufacturing sector to the SDP is between 2% to 5% in Nagaland, Tripura, Mizoram, Meghalaya and Arunachal Pradesh. Manufacturing sector accounts for 7.15% of the SDP in Manipur and 13.90% in Assam. This indicates an important fact that the process of industrialisation in this region has so far been negligible. This is partly due to lack of physical infrastructure, transport bottlenecks and because of the lack of trained manpower etc. The lack of entrepreneurship among the people has also contributed to the extremely slow growth. The entrepreneurs in this region from outside the state are generally not allowed.

Agriculture and allied activities :

3.4.14 Rice is the most important crop of this region. Area under cultivation, production and per hectare yields of rice for 1980-81, 1985-86 and 1990-91 is indicated below :

	<u>1980-81</u>	<u>1985-86</u>	<u>1990-91</u>
Area 000 hectares	3064.3	3298.5	3325.6
Production 000 tonnes	3526.1	3986.8	4528.1
Per hectare yields	1150	1209	1361

3.4.15 it will be seen from the above table that the output of rice has gone up from a level of 35.3 lakh tonnes in 1980-81 to 40.0 lakh tonnes in 1985-86 and 45.3 lakh tonnes in 1990-91. This growth in output has materialised partly because of the increase in the area under rice cultivation and partly because of an increase in the per hectare yields. The output of rice could have been much higher but for the recurring floods in the Brahmaputra river almost every year and this seriously affects the sustained growth in the rice output. Also there is a lot of scope for developing short duration crop varieties of paddy in this region which are acceptable to the farmers. The government is already taking steps to control the floods through various flood management programmes.

3.4.16 The production of rapeseed and mustard among the oilseeds in this region has increased from 1.57 lakh tonnes in 1985-86 to 1.97 lakh tonnes in 1990-91. About 80% of the output of rapeseed and mustard originate in the Assam State. The production of sugarcane in this region has, however, shown a decline from 22.3 lakh tonnes in 1985-86 to 18.1 lakh tonnes in 1990-91. In Assam alone, the production of sugarcane has declined from 19.71 lakh tonnes in 1985-86 to 15.22 lakh tonnes in 1990-91. Similarly, the output of jute has declined from 12.55 lakh tonnes in 1985-86 to 9.41 lakh tonnes in 1980-81. Assam State has contributed largely to this decline in the jute output.

3.4.17 Banana, pineapple and papaya are the major fruits grown in the North East Region. The statistical base of the estimate of yield in this Region is rather weak. The following table indicates the area under cultivation and the production of selected varieties of fruits and vegetables in 1990-91

Crop	Area 000 ha.	Production 000 tonnes	Per hectare producti- vity tonnes (North East)	All- India
Banana	50.1	553.3	11.0	19.9
Pineapple	30.2	307.8	10.2	13.5
Orange	21.4	104.9	4.9	8.0
Coconut	10.8	71.9	6.6	6.4
Potato	88.1	553.6	6.3	16.2
Onion	6.4	17.4	2.7	10.6

3.4.18 It will be seen from the above table that the per hectare yield in this region has been lower as compared to the all India average in all major fruits. However, the yield in respect of coconut is comparable to the all India figure. In the case of vegetables like potato and onion, the per hectare yield is way behind the all India level. The low productivity of fruits and vegetables in this region is because of the plantation of inferior variety of fruits and vegetables coupled with faulty agronomic practices being followed here. There is, therefore, an urgent need for the promotion of high yielding varieties to replace the existing low yielding varieties. Further, the post harvest utilisation of the surplus fruits and vegetables is very inadequate in this region and such a scenario leads to considerable wastage. It is in this context that the North East Regional Agriculture Marketing Corporation (NERAMAC) was established to help in food and fruit processing. However, this Corporation has not so far been able to give a good account of itself. Attempts are being made to revamp this agency.

3.4.19 Ginger, garlic, chillies and turmeric are the major spices produced in this region. The area covered by these, their production and per hectare yield in 1990-91 are given below :

Species	Area 000 ha.	Production 000 tonnes	Yield per ha. tonnes
Ginger	14.5	143.4	9.9
Chillies	23.0	17.7	0.8
Garlic	8.4	23.3	2.8
Turmeric	12.0	10.8	0.9

3.4.20 The average productivity of spices in this region is much lower as compared to those of the other exporting states. The productivity levels can be increased by using high quality planting material and through the adoption of better agronomic practices and harvesting techniques.

Poultry and piggery :

3.4.21 There is considerable scope for the development of poultry, piggery and fishery in this region. The production of eggs was 533 million in 1985-86. It has increased to 721 million in 1990-91. However the non-availability of poultry feed material to the desired level in terms of maize, oil cakes is, however, proving a limiting factor in the growth of poultry. As a result, the demand for eggs is being met from their imports from distant places like Andhra Pradesh.

3.4.22 Because of the high cost of eggs, people now are taking to piggery and fish production. In order to develop these sectors, the necessary infrastructure facilities including processing and marketing will have to be developed.

Fisheries :

3.4.23 This region also possesses a high potential for fishery development. The demand of fish is quite high here. This is estimated at 3.0 lakh tonnes assuming 11 kg per adult annual consumption. During the Eighth Five Year Plan, increased emphasis will be given to the production of quality fish seeds and the creation of additional water areas for the intensification of increased production of fish.

Jhum Cultivation :

3.4.24 This type of cultivation in the North East Region is a way of life. Jhum cultivation enables them to grow food, cotton, tobacco etc. for their subsistence living. To tackle the problem of jhum cultivation, a central sector scheme was started for a period of five years with effect from 1987-88 involving Rs.75 crores in 9 States viz. seven states of North East Region and Andhra Pradesh and Orissa. This scheme was subsequently terminated in 1991-92. Under this scheme, a few thousand jhumia families have been rehabilitated. On the basis of evaluation studies carried out by the Union Ministry of Agriculture and the Planning Commission, it has now been decided to redesign the scheme and introduce it again in the various states of North East Region. This scheme is likely to benefit substantially several thousand jhumia families of this region.

Development of infrastructure facilities :

3.4.25 Maximum emphasis is being given on the development of infrastructure facilities in this region. These facilities include development of power potential, road and railway network, expansion of banking facilities etc. The progress made in the development of these infrastructure facilities is indicated below

Power :

3.4.26 The installed capacity of power has increased from 341.24 MW in 1979-80 to 797.88 MW in 1990-91 thereby showing a growth of 456.64 MW during this period. The maximum growth in the power capacity has been observed in the Assam state which is of the order of 375.41 MW. Statewise details are indicated below :

State	Installed 1979-80 MW	Capacity 1990-91 MW	Increase in power capacity MW
Assam	161.78	537.19	(+)375.41
Meghalaya	131.16	133.76	(+) 2.60
Manipur	15.00	12.01	(-) 2.99
Tripura	15.98	53.36	(+) 37.38
Mizoram	2.89	22.43	(+) 19.54
Nagaland	3.66	6.82	(+) 3.16
Arunachal Pradesh	10.77	32.31	(+) 21.54
Total	<u>341.24</u>	<u>797.88</u>	<u>(+)456.64</u>

3.4.27 The per capita consumption of power in this region has varied between 50 kwh in Tripura and 110 kwh in Meghalaya in 1990-91 as against the all India average of 253 kwh. Emphasis is being laid on adequate funding of the ongoing power projects e.g. Kathalguri, Kopili extension projects in Assam and Agartala, gas turbine power project in Tripura. The Central hydro electric projects, being executed by the NEEPCO through the funding of the North Eastern Council (NEC) are Doyang in Nagaland and Ranganadi in Arunachal Pradesh. In order to facilitate their early completion, an overall support effort will be extended to increase the outlay for these projects for their early completion. The availability of power, consequent on the completion of various power projects in this region, is being synchronised with the implementation of major power transmission schemes in this region. With the completion of the various power projects, this region is likely to be surplus in the availability of power and this surplus power could be diverted for use in the adjacent states of West Bengal, Orissa and Bihar.

Roads :

3.4.28 The various ongoing road projects are being undertaken in this region with the funds being made available by the NEC to the State Works Departments for some road works and to Border Roads Organisation for other road works. It has been observed that in some of the States of this region, too many road projects are being undertaken at the same time and at times due to heavy rainfall, some of the road projects have remained incomplete for several years. Inadequate funding of the road projects also contributes to this delay. In view of this it has been emphasised that there is a need to prioritise the road works relating to widening/strengthening of the various roads as also of the new roads, keeping in view the availability of financial resources, the economic importance of the roads and the engineering capabilities of the states. The length of the surface roads in this region upto March 1988 amounted to 25358 km. The NEC

has contributed to this total in the form of widening/strengthening of the existing roads as also the construction of the new roads to the extent of 7000 km. In this region, the cost of construction of roads is very high as the region is associated with very high rainfall and geologically these are young mountains. The roads in this region are prone to landslides during the monsoon season. It is being brought to notice that the roads which are likely to be completed during the next 2 to 3 years should be given preference so as to provide an early impact on the movements of goods and people to this region.

Railways :

3.4.29 High priority should be accorded to the development of railway infrastructure in the North East Region. The people of this region have long demanded the extension of the broad gauge railway lines to provide a direct connection to the major cities of India. This is for the convenience of the people of this region and for the economic development of the entire area. Keeping these aspirations in view, the Ministry of Railways has taken up a massive gauge conversion works in this region. The gauge conversion work has been taken up for the entire section from Guwahati to Dibrugarh. The schedule for the completion of this project is as follows :

- (a) Guwahati to Lumding (181 km) to be completed by March 1994 at a cost of Rs.139 crores;
- (b) Lumding to Dibrugarh (628.13 km) to be completed by December 1996 at a cost of Rs.300 crores

The work on the above lines is proceeding as per the target schedule.

Telecommunications :

3.4.30 Development of telecommunication is one of the critical inputs which will accelerate the pace of socio-economic transformation of the tribal and rural areas in the North East Region. This Region is being covered through the satellite link. During the Eighth Plan, the objective is to achieve the target fully in the area of telecommunication of this region. By 1st April, 1995, the Gram Panchayats of the rural areas will also be covered by the satellite network. The STD facility in the capitals of all the states and in other major cities of the entire region is fairly good. However, the inter-state communications network needs improvement. The necessity to improve the quality of telecom services in this region cannot be overemphasised, as this region lacks a full development of roads and railways and therefore telecommunication becomes the most important service.

Banking :

3.4.31 The credit deposit ratio in 1989 was 54.2% in Assam, 67.2% in Tripura; 72.7% in Manipur; 24.3% in Meghalaya; 36.5% in Mizoram; 32.7% in Nagaland and 38.5% in Arunachal Pradesh. These figures are too low and there is a need for a greater utilisation of deposits collected in this region for

its economic development. This would involve the introduction of more and more bankable projects by the concerned agencies of this region. Some constraints are being faced by the banks and other financial institutions in financing the various economic activities of this region. These are (a) low recovery of funds advanced; and (b) a major portion of the cultivable land belongs to the community, or these are tribal lands and as such, cannot be hypothecated. It is understood that financial institutions like the NABARD are adopting innovative methods to help the states in financing the bankable projects of this region.

Concluding Remarks :

3.4.32 Thus, it can be seen from the above that if the North East Region can accelerate its economic growth and development, then the various infrastructure facilities like power, roads, water, transport network, communication facilities would have to be developed on an urgent basis. The infrastructure facilities must be developed in this region on a cluster basis in such areas which are eminently suited for development and these have the necessary agricultural and agro-industrial base. Training in specialised fields of economic activity, relevant to the North East Region, has to be imparted to the local work force with a focus on the development of their entrepreneurial abilities. In the various fields of procurement, processing, value addition and marketing, maximum emphasis must be placed on the development of a cooperative culture in this region. However, it has to be further indicated that a proper development strategy should be evolved for this region without disturbing the cultural ethos and the customs and traditions as prevalent in the tribal societies. It has also to be ensured that the development strategies must be followed by avoiding environmental degradation of the North East Region as a whole. Several special features related to land utilization pattern of the twelve Himalayan States are given in Annexure VIII.

WEST BENGAL

3.5 The region of West Bengal coming under the Himalayan range, possesses natural resources like forests, water, minerals, wildlife and is rich in scenic beauty. Due to exploitation of natural resources and lack of scientific planning, the ecological condition of this part of the Himalayan region is gradually deteriorating leading to serious imbalances. Furthermore, the ecological havoc of the hilly tract has both direct and indirect impacts on the plains in the south. The threat to the environment is both local and regional and varies in magnitude from the deterioration of small ecosystems to the total destruction of some regions. It is thus urgent to minimise the threat of ecological hazards and for keeping the environmental conditions intact.

3.5.1 The West Bengal terrain is highly variable in its configuration. It has lower ranges in the West high ranges in the East. Between the two higher regions of the North East and North West lies a tract of comparatively lower height. The hills in this part are similar to the other part of the Himalayas and

have experienced ecological havoc due to unplanned, unscientific and unwise activities. Cutting of trees for timber, fuel and fodder, road construction, human habitation, mining, etc. having gradually reduced the forest cover to a minimum and have resulted in increased surface runoff resulting into inrills and gullies, which finally lead to soil degradation and landslides. Due to soil erosion, the river beds become shallow because of continuous siltation. Deforestation and overgrazing have deepened the underground water level in the area.

3.5.2 The forests of the region have already been degraded due to commercial exploitations. Valuable trees have been cleared off by the Forest Department as well as by the thieves. This has caused severe damage to the soil in the hills. Actually the local villagers are mainly dependent on the forests for firewood. With the cutting down of forests, the animals have also been shifted from one region to the other which has created further ecological imbalances. In addition, illegal felling of trees has not only damaged the scenic beauty of the area but also has changed the micro-climatic conditions reducing the rainfall and increasing the occurrence of occasional droughts resulting into drying up of the springs.

3.5.3 The limestone rich rocks in the hills are used for extracting dolomite in large quantities. This has resulted in further loss of vegetative cover and leading to soil erosion. Copper is found in the quartzites iron ores which is embedded with the slate. Deimatong, magnesium sulphate, chunabhati, etc. are some of the other minerals found here. These at present have limited economic value.

3.5.4 Increase in the human habitation is partly responsible for creating the ecological imbalances. Apart from mining and deforestation, making roads for easy transportation of forest products, extension of tea gardens in the hilly sections, unscientific grazing of livestock etc., have spoiled the vegetal cover of the slopes resulting in soil loss, excessive siltation, reduction of marginal land and changes in the hydrological and climatic behaviour of the hills. Constant illegal migration from Nepal, Sikkim and Bhutan is also creating the socio-political and economic disturbances. The people coming from the adjoining regions have no other alternative but to exploit the nature unscientifically because of their economic and academic backwardness. Thus the management strategies to be followed should be:

- (i) Environmental and forest education, hydrological studies, landuse studies, sheep breeding and development of fodder and grassland. Traditional agriculture on the hills which is uneconomic to be replaced by forestry, horticulture and agroforestry.
- (ii) Formulation of ecological standards for the areas and an accurate assessment of the ecological situation for taking further action.
- (iii) Mapping of ecologically sensitive areas, zoning of hazardous areas.
- (iv) Protection from encroachment in dense forest, promotion of high quality cattle breeding and cultivation of low volume and high value crops.

- (v) Enforcement of laws in the mining area. Drainage lines from the mining areas to check soil erosion.
- (vi) Reduction in landslides by soil erosion control, contour bunding, benching and grading of slopes. Plantation of mixed coniferous and broad-leaved species and cultivation of fodder and fibre crops.
- (vii) Involvement of the local people in the co-ordinated development programmes, planning of the future land use, promotion of man-nature harmonious relationship and all round development of the region.

JAMMU & KASHMIR

3.6 Jammu & Kashmir state comprises of three regions namely Ladakh, Jammu and Kashmir. Among these, Ladakh constitutes the northern most administrative unit and it is a vast arid table land at high altitudes. The area is mostly barren, treeless and has high vertical cliffs of black grey and brown sand, arranged in superimposed manner facing the streams or rivers. Ladakh is a vast cold desert, but at some places the broad flat valleys are lush green which are a heaven for the animal wealth. People live at heights ranging from 2800 to 5000 m above MSL. The mighty Indus runs through the region. It is characterised by numerous alluvial forms of soil. In the northern Ladakh are the Karakoram ranges radiating to South-Eastern direction from the Pamir. Some renowned glaciers like the Baltore, Hispor, Rino, Baifor, Batunna are located here.

3.6.1 The climate in the Ladakh region is very cold, arid and dry. The temperature ranges from -40 degree celsius to 18 degree celsius whereas the average annual rainfall is 20cm or below. Due to the peculiar cold climate, the vegetation gets limited. Trees like 'Juniperus' are common. Indiscriminate grazing and lopping further reduces the vegetation in the area. Small millets, vegetables, fodder, some orchards, medicinal plants and herbs are the vegetation found in the area.

3.6.2 Jammu area, popularly known as the Kandi area, is sub-tropical with extreme temperature (max. ranging from 46 degree celsius to 20 degree celsius). The terrain of this area is rugged and intersected by the rivers like Ravi, Chenab, Ujli, Tawi etc. The Jammu region is characterised by a thick undergrowth of bushes and scrubs with trees like Neem, Tura, Khain, Thorry and many others. Soils have low moisture retaining capacity. Therefore, the people do not have adequate sources of livelihood from agriculture. For meeting their daily requirement of fuel and fodder they use forests. Therefore, activist organisations like the 'Save Siwaliks' have come up in this region.

3.6.3 Excessive deforestation in the Siwaliks has led to sharp degradation in the ecosystem of the Jammu region. The horticultural potential of the Jammu region has not been exploited properly. Fruits like plum, papaya, guava and grapes grow in plenty but due to poor storage and transport facilities, these are not grown and exploited economically. Grazing has also resulted in the degradation of vegetal cover in the Jammu region.

3.6.4 In the Ladakh and Jammu regions, afforestation is required in a big way. Further destruction of forests must be checked in these two regions. Ladakh has abundant wind power which can be converted into energy. It will reduce dependence on fuel wood consumption and will partly solve the energy crisis in this cold desert. Efforts in maintaining an appropriate level of cattle population, increasing tourism and improving the economic well being of people are required in both the region.

3.6.5 The enchanting valley of Kashmir is situated in between the mountains popularly known as the Great Himalaya. Located in the flood plains of Jhelum, the old lacustrine basin of Kashmir has an area of about 4865 sq.km. It is a land of clear streams, beautiful lakes, lush green turf, magnificent trees and majestic mountains. This region is called the best place in the Himalayas. Rivers have a special significance of this region. The Indus, the Jhelum and the Chenab are the three important rivers whereas the Ravi also touches the fringes of the state. Most of the lakes found in the Kashmir region are glacial in origin. The Dal, the Wular and the Manasbal are the loveliest lakes of the valley.

3.6.6 The climate of Kashmir is tropical, temperate and cold. These factors have contributed to a unique type of vegetal cover in the mountains. Deciduous, conifers, shrubs and meadows, and several other types of vegetation are found in different regions. At one time, the valley was thickly forested. The districts Baramulla and Anantnag had 71% and 60% of their areas under the forest cover respectively. Today, the decline in the forest cover is alarming. The Scrub-forest still dominate the outer plains and Siwalik ranges.

3.6.7 Forests have a great significance for this region. Besides adding charm and aesthetic beauty, the trees extend many benefits to the local population. It is said that the Kashmiris put nearly each and every plant to some use and attribute medicinal properties to every growing plant. Condiments, drugs, dyes-tans, fibres, fodders, food-fruits, medicines, scents, poisons, timber and many other items are obtained from different plants. However, greatest benefits are obtained from the forests in the form of timber. Trees like deodar, blue pine, spruce, silver fir, alder, elm, ash walnut, chestnut, poplar, maple, birch, willow and mulberry etc. provide timber for different purposes.

3.6.8 The soil of the Kashmir Valley is fertile and agriculture is the mainstay of the economy. Only 28.5% of the total area is put to cultivation. Rice, wheat, maize, bajra, barley and millets are the main food crops. While oil seeds are cultivated for the extraction of oil used for cooking and lighting. Mustard is the most common of the oil seeds. Rape and linseed come next. Rajmah is the common bean grown there. Saffron (Kesar) the anthers of the flower Crocus sativus, reputed for its delicacy and medicinal properties, is cultivated here. It is, of much economic value. Vegetable growing, horticulture, bee keeping, animal husbandry, poultry and sheep breeding and rearing are the main occupation of the people. Several types of minerals are known from this region. Kashmir handicrafts, as products of art, are known throughout the world - carpets, rugs,

shawls, woollen and fur garments, silver wares, papier mache, stone jewellery, wood carving, embroidery, indicate the creativity and craft of the Kashmiris. Industries in the state include textile and forest based products. There is a cement factory, other small industries are for ceramic wares, metal ware, leather goods and synthetic detergent.

3.6.9 The region has a well developed infrastructure for tourism which is the biggest industry for Kashmir. The valley is not fit for starting heavy and large industries. Once its agriculture, horticulture and related small industries are properly developed, it can become a prosperous region.

CHAPTER - IV

RESEARCH AND GENERATION OF APPROPRIATE TECHNOLOGIES

4. A sound process of socio-economic development which takes note of the fragility of the Himalayan region and the need for conservation of its unique ecology necessarily highlights the need for the generation of appropriate technologies for ushering in socio-economic development of the region. In some measures, while the development process of the Himalayan region has to be seen as an integrated part of the development process of the entire country, yet in many ways, the developmental needs of the region could be considered to be distinct and different as compared to other regions. The backstopping of the development process through appropriate technologies is a theme with which every one in the country has been concerned. Such technologies do also call for specific and problem oriented research. In the last several years, the Government of India and the State Governments have established a number of institutions with the mandate for the study, research and development of technologies. Some of the major ones are indicated in the following paragraphs.

Gobind Ballabh Pant Institute of Himalayan Environment & Development (GBPIHD), Almora

4.1 This institute is an autonomous body under the Ministry of Environment and Forests. It was founded in 1988 as a focal point for documentation, dissemination and demonstration for research and development in the whole Indian Himalayan region. The Institute is involved in evolving effective strategies based on multi-disciplinary analytical approaches for integrated resource management to alleviate the pressure on social, economic and ecological systems and to restore the vitality of the Himalayan region. The four core areas identified by the Institute for an in-depth research are: land and water resource management, sustainable development of rural ecosystem, ecological economics and environmental impact analysis, and conservation of biological diversity. Networking of scientific talents and knowledge through collaboration with the other institutions involved in strategic research and development studies, located within the Himalayan region and elsewhere, forms the other important sphere of activity of this Institute. Moreover, the Institute is expected to become a repository not only of gene pools but also of the pool of knowledge required to convert natural endowments into economic wealth based on sound ecological and social ground rules.

Indian Council of Agricultural Research -State Agricultural University (ICAR-SAU) Research System, New Delhi

4.2 The work of undertaking research in agricultural sciences and technologies, their dissemination and extension is the primary task of the Indian Council of Agricultural Research - State Agricultural University Research System. Several important national institutes under the ICAR are located in the Himalayas. Several

of the States wholly located in the Himalayan region have established Agricultural Universities whose primary mandate is to consider problems essentially of the Himalayan region and develop location specific technologies. Mention in this connection could be made of Sher-e-Azad Kashmir University of Agricultural Sciences and Technology, Srinagar; Dr. Yashwant Singh Parmar University of Horticulture and Forestry, Solan, Himachal Pradesh; Krishi Vishwavidyalaya, Palampur etc. In addition, the Gobind Ballabh Pant University of Agricultural Sciences and Technology at Pant Nagar has also a hill campus at Ranichauri in the Kumaun region. A Central Agricultural University is also being established at Imphal, Manipur with a number of associate colleges in different States of the north-east region. The ICAR-SAU Research System has been attending to generate appropriate technologies in the entire area of agriculture, as defined in the comprehensive sense, including crop husbandry, animal husbandry, horticulture, fisheries, agro-forestry etc.

Wadia Institute of Himalayan Geology(WIHG), Dehradun

4.3 The Head of the Wadia Institute of Himalayan Geology (WIHG) also participated in the deliberations of the Expert Group. The role of WIHG cannot be overemphasised as this is a premier institute for studying the overall geology with specific reference to the role of glaciers and glacialized zones in the Himalayas. As pointed out in the earlier chapters, the glaciers play a very vital role in controlling the water regime. Therefore, glaciological studies become all the more important. Before making any further plans we have to take into consideration the plio-plistocene deposits of the ice and the role of glaciers in the everyday life of the inhabitants in these glacialized zones with special reference to estimating the water feed into the rivers and their hydro-power potential. This role further extends in the fields of civil engineering and environmental management along with climate control in the hills. The institute set up in 1968 and based in Dehradun, is an autonomous institution under the Government of India, Department of Science & Technology.

National Geophysical Research Institute (NGRI), Hyderabad

4.4 Major research objectives of this institute are to determine the entire structures of the earth at different depths with increasing accuracy and to improve our understanding of the earth through the study of nature, location, environment and the time of occurrence of geological events in the ancient past. This institute conducts Deep Seismic Sounding (DSS), uses scientific methods for the location of underwater resources in the hard rock areas for making bore holes. It has an advanced seismological observatory in the campus which maintains a complete record of the earthquakes occurring in any part of the earth. This observatory produces accurate data which are exchanged internationally. The work of this laboratory becomes very relevant for such Himalayan regions which are earthquake-prone and which have experienced many earthquakes in the past.

Indian Council of Forestry Research & Education (ICFRE), Dehradun

4.5 ICFRE has been established with the mandate for conducting, facilitating and coordinating forestry research, education and extension. The research priorities of this council are decided in consultation with the users and their field research programmes are generally collaborative and these are carried out with the active support of the state forest departments. The experimental areas and the manpower utilised for research are largely contributed by the state forest departments and the results are utilised - extended for wider application. The public sector organisations and the NGO's have also begun to take a keen interest in the afforestation programmes and some have initiated their own researches and are desirous of the ICFRE support, particularly the paper mills. Agriculture universities and other academic institutions with their forestry faculties have also developed a keen interest in forestry research and are being financially assisted in their endeavours of mutual interest. This project proposes to strengthen the ICFRE organisations for the identification of priority areas in research, coordination of research between the institutions which have interest in the field, through collaborative research efforts and financial support. A proposal for providing research grants to the state forest departments, NGO's, universities, and industries has been included in the project to enhance their research efforts.

4.5.1 The ICFRE, as a National Council, is promoting and funding research in different agencies, facilitating the dissemination of information, and promoting the application of research in the field of forestry. Six research institutes and two research centres are currently under the umbrella of the ICFRE.

International Centre for Integrated Mountain Development (ICIMOD), Kathmandu

4.6 International bodies like ICIMOD have also to play a crucial role in the holistic and ecofriendly development of the Himalayas. ICIMOD is the first International Centre in the field of mountain area development. It was founded as a result of widespread recognition of the alarming environmental degradation of the mountain communities. A coordinated and systematic effort on an international scale was deemed essential to design and implement more effective developmental responses in each of the countries concerned. The establishment of the Centre is based on an agreement between the Government of Nepal and UNESCO in 1981. The Centre has its Headquarter in Kathmandu (Nepal) and started functioning in 1983, with professional activities starting in September 1984. The participating countries are India, Nepal, Bhutan, China, Burma, Bangladesh, Afghanistan and Pakistan. ICIMOD has a status of an autonomous international organisation. During the meetings of the Expert Group, Dr. N.S. Jodha, Head, Mountain Farming Systems Divisions of ICIMOD was invited and he benefited the discussions with his immense knowledge on the Himalayan developmental problems. Poverty in most of hill regions is caused by inaccessibility, fragility of the area among others. Dr. N.S. Jodha, in his paper presented before the Expert Group, entitled "Perspectives on Poverty Generating Processes in Mountain

Areas" indicates that there appears to be poverty in the general sense in most of the mountain areas the world over. This is because the mountain areas are characterised by some specific features which shape the pattern of activities leading to poverty conditions. These conditions are created by special characteristics such as inaccessibility, fragility, marginality, diversity and niche which prevent a proper utilisation of the mountain resources.

4.6.2 **Inaccessibility** is a major constraint because there are a number of logistic problems in reaching the areas. Thus the, utilisation of resources or their recycling become more difficult.

4.6.3 **Fragility** is because of the vertical nature of the environment. Steep slopes make any activity quite disturbing to the mountains. This prevents large scale landuse.

4.6.4 **Marginality** is a mountain characteristic. It leads to low pay-off option and high cost of utilisation of resources.

4.6.5 **Diversity** is indicated by heterogeneity and is manifested by physical and biological differences over short distances, hence there are large differences in the resource picture.

4.6.6 **Niche** represents special situations in mountain areas such as irrigation and hydro-power potential, timber and tourism, minerals and medicinal plants etc. The harnessing of these resources are linked with land base activities.

4.6.7 Dr. N.S. Jodha of the International Centre for Integrated Mountain Development (ICIMOD) further explains the limitations in harnessing the natural resources in the mountain ecosystem. These lead to diversity in the approach of the people. The remedial measure lies in an integrated approach which involves a full understanding of the mountain problems and their solution. Many programmes can be developed with sufficient innovation and creativity which will help in improving the quality of life of the people, and eradicating poverty.

Other Institutions

4.7 Other institutions such as Roorkee, Traditional Universities and other Central Institutes dealing with avalanches, landslides and oil sector such as ONGC have been engaged for developing modern and appropriate technologies for the Himalayan region.

Oil & Natural Gas Commission (ONGC)

4.7.1 In the 4th meeting of the Expert Group which was held in the Keshav Dev Malviya Institute of Petroleum Exploration (KDMIPE), Dehradun in April, 1993, the Oil and Natural Gas Commission (ONGC) revealed its perception on Energy need for the Himalayas and its solution. Dr. A. Bhattacharya, Economic Adviser, ONGC, on behalf of the ONGC, detailed that the entire Himalayan region has been placed in the categories of I and IV as far as sedimentary, oil bearing basins

in India are concerned. Category-I depicts the basins known to be hydrocarbon bearing on a commercial scale (Assam, Tripura & West Bengal) and Category-IV means sedimentary basins of interminate prospects (J&K, UP etc.). He also informed of the ONGC's plan regarding proposed National Gas Grid in the Himalayan region. The grid would have a span from Jammu, Siliguri, Kohima, Lumding and Agartala in the hills. The ONGC Action Plan for the Himalayan Foot Hills and the Ganga Valley would begin to produce in terminal year of Ninth Plan (1995-2000), 0.11 MMT of oil and 0.141 BCM of gas. The production is predicted to go on increasing with the progress of successive plan periods.

Indian National Trust for Art and Cultural Heritage (INTACH)

4.7.2 In the field of total development of Himalayan region in an ecofriendly manner INTACH has also been taking part. INTACH in its interaction meeting with the Expert Group raised several crucial points of common interest in the Himalayas. The organisation raised issues regarding earthquake hazards vis-a-vis large dams in the Himalayas and stressed the need for carrying out detailed earthquake assessment while designing large dams using sophisticated methods. Other points to which the Expert Group's attention was invited by INTACH were in the fields of tourism, horticulture, livestock and improved farming techniques in the Himalayas.

Universities

4.7.3 In the Himalayan region, Central Universities, Agricultural Universities and other deemed Universities have been playing an important role in doing research and extension work in the development of a particular Himalayan region in which they are located. The North-Eastern Hill University (NEHU), Shillong, with its sub-centres and research facilities, has been playing a vital role for doing premier research for the Himalayan development. Regional Research Laboratories of ICAR and CSIR along with the institutions like the IDPL are also engaged in this field.

Non-Governmental Organisations (NGOs)

4.8 An extremely important and salient development in the Himalayan region has been the active involvement of several non-governmental institutions, especially the voluntary agencies who have strengthened the development activities, based on their local knowledge and wisdom. Many voluntary organisations have in the process attempted not only awareness in the environmentally sound development of the area but essentially had drawn upon the local time-tested methods for furthering the development process. Mention could be made of a few of these such as Dasholi Gram Swarajya Mandal, SHERPA, Silyara Ashram etc. The Group had the privilege of interacting with many of the leading persons of these voluntary agencies. A summary of the perceptions of the moving spirit of these movements is indicated in Annexure-IV.

4.8.1 **Silyara Ashram** In the Himalayan region, the voluntary agencies and other development-oriented research organisations, have been doing great service of uplifting and creating the awareness among the local people. The

Chipko movement is all too important and known among the people of India and abroad. The spirit of saving Khezri and sacrifice of 363 people from the Rajasthan desert can be seen reverberating in the lofty Himalayan hills. Persons like Shri Sunderlal Bahuguna have strived for protecting the Himalayan ecology, forest, ethnicity and the way of life of the Himalayan people. The contribution and awareness generated by him and his organisation are unique. A detailed presentation was made by Shri Bahuguna before the Expert Group in the Planning Commission, the details of which are given in the Annexure IV.

4.8.2 **Dasholi Gram Swarjya Mandal** and its chief activist Shri Chandi Prasad Bhatt has been the chief architect of the awareness programmes involving women in the conservation and development of the hills. The amount of work and motivation generated by this institution can be rated as outstanding, rare and admirable. His views are given in Annexure IV.

4.8.3 **SHERPA** is an other voluntary organisation active in the field of development of hill people by taking up concrete programmes of action. Society for Himalayan Environmental Rehabilitation and People's Action (SHERPA) and its chief Shri T.N. Dhar have been doing excellent work as a catalyst for the Himalayan development. In fact, the twin goals of development and conservation in the Himalayan region have been pursued by SHERPA with utmost zeal. During the interaction with the Expert Group, Shri Dhar pointed out that there is a need for creating people's institutions in the Himalayas which could look into various issues. The important sectors where the emphasis should be laid, may be in the sectors of Public Distribution System, Women Literacy and encouraging the value addition within the hills. The Expert Group had the benefit of having detailed and valuable interaction with SHERPA.

4.8.4 Apart from the above mentioned NGOs, there are other voluntary agencies in the Himalayan region, acting as catalysts of economic development and social change. Some of these are the Parvateeya Jan Kalyan Samiti in Ranichauri (Tehri Garhwal), the Rural Centre for Human Interests (RUCHI) in Sirmour, Himachal Pradesh and the Shiva Gramodyog Mandal in Kathua, J&K. These are engaged in various activities like providing training to local youth in rabbit rearing (Angora wool), nursery plantation, education, health services, women's self reliance, khadi & village industries, rural development etc.

Indigenous Technologies

4.9 In different regions of the Himalayan States, the local people have adopted technologies which have enabled to meet their needs without serious adverse implications on the environmental preservation. Their life styles and methodologies adopted to meet their needs ensure that the local ecology does not get impaired. What appears to be a critical need is to integrate the indigenous technologies, which have stood the test of time in the process of generation of appropriate technologies for rapid development. In this, one must consciously look for proven local technologies which must be promoted as a part of the overall technological catalysts for development.

CHAPTER - V

MAJOR SOCIO-ECONOMIC AND ENVIRONMENTAL ISSUES

5. The natural resources of the Himalayas have been threatened largely because of human negligence and unplanned activities. Geological instability interacting with a complex set of problems including the population pressure, deforestation, land slides, soil erosion, floods, water scarcity, outward migration of people and poverty manifest the fragility of the Himalayan ecosystem in different forms. As a result, major changes in the Himalayas have been introduced. The type of activities undertaken in pursuit of attaining a higher standard of living or enjoying a better quality of life, is by utilising different kinds of material resources for meeting the necessary requirements. The problems faced by the different sectors such as agriculture, environment, horticulture, soils, energy, tourism, population, industry, health etc. in the Himalayas have been analysed as follows:

AGRICULTURE

5.1 As much as 84% of the net sown areas in the Himalayas depend on the agriculture sector. This is beset with the problems of a poor and deteriorating land resource base, small and fragmented land holdings, lack of irrigation facilities, an improper land use pattern, lack of appropriate technology and inadequate credit and marketing facilities. Besides these, poor and inadequate infrastructure and the lack of arrangements for the supply of new inputs like the HYV seeds, fertilisers, pesticides etc. are the other constraints in increasing the agricultural production. Lack of credit agencies such as commercial banks or cooperatives and the attitude of the commercial banks towards credit worthiness of the hill farmers have been discouraging the agricultural development. The cooperative credit societies, which were supposed to supplement this deficiency, have gradually disappeared. Marketing facilities for seasonal, perishable crops like tomatoes, potatoes, beans, capsicum, chillies etc. are also not adequate. Similarly, the role of village level workers, agricultural development officers, veterinarians etc. has not been properly recognised. These crucial functionaries also did not have an adequate rapport with the farmers to tackle their problems.

5.1.1 Insufficient and fragmented data about the hill economy and agriculture play a big role in the backwardness of the agricultural practices in the Himalayas. The problem of "off farm sources of income being an important element in the farmers' incomes" has been identified as the major one. Since the manual labour is the most important means of wage earning in the area, the programmes involving intensive labour have not been taken up. Horticulture, fruit and vegetable production and their processing, besides the associated animal husbandry and bee-keeping, have also been overlooked. Good cereal crops like the ragi, wheat, maize and soyabean were not taken up vigorously. Tropical and subtropical fruits like citrus, mango, guava, papaya etc. at the heights upto 1000 m above MSL could have been tried to supplement the incomes of the

farmers. At the middle altitudes of 1000- 1600 m above MSL, fruits like apricot, walnut, peach and plum could have been tried. At very high altitudes over 1600 m MSL, apples could have been grown.

5.1.2 Small land holdings make an extremely low land-man ratio. About 90% of the land holdings are below one hectare in size. Such small farms are scattered and fragmented. Consolidation of the land holdings is a big problem but it forms a necessary step for the development of horticulture/orchards which is a most promising enterprise for the area. The main crops in the kharif season are paddy, ragi, soyabean, urad etc. while the rabi crops are wheat, barley, lahi, rapeseed, mustard, lentil, potato etc. A glimpse of the land use pattern in the Himalayan States can very well indicate the way the land is being utilised for agriculture and allied activities. Table 6 gives the land use pattern in the hill districts of U.P. Annexure-VIII gives the land utilization pattern in Arunachal Pradesh, Assam, Himachal Pradesh, J&K, Manipur, Meghalaya, Mizoram, Nagaland, Tripura and Sikkim.

Table: 6
Land use Pattern in the Hill Districts of U.P.

Category	Ownership	Percentage
Forests	Forest Department	45%
Civil Soyam Forests	Community	15%
Panchayat Forests		4%
Private, cantonment & Municipal Forests	Forests & Local Bodies	15%
Usar	Community & Private	15%
Agriculture wasteland	Private	6%
Pasture and othergrazing land	Community	4%
Other tree shrubs	Community & Private	4%
Non-agricultural use	Private	2%
Fallow	"	2%
Area actually sown	"	14%

5.1.3 The main objective of agricultural planning and development in the hills should not be self-sufficiency in food only, but a proper conservation of the land and water resources according to the capability should be used, so that the land is available for a long-term productive use. In the hills, the settlement pattern shows that generally human settlement is confined to the mid ridges,

with forests on top and the agricultural lands below. The irrigated lands are the well terraced land, and even in the rain-fed areas, terracing of the cultivated land is common. But due to population pressure, lands upto 65% slope and above have been brought under agriculture without adopting adequate conservation measures. This practice has led to disastrous effects. The striking feature of the agriculture in the Himalayas is that it is dependent on forest-based inputs for crop production. Furthermore, the agro-climatic conditions of the Himalayan region render the agriculture an uncertain proposition. Although there is a wide range in the farming practices operating in the region, there are a few commonalities. These include crop diversity involving mixed cropping rather than crop rotation, subsistence rather than commercial value of agriculture, maintenance of soil fertility through natural processes and strong linkages between the crop management, animal husbandry and forests. Climatic conditions optimal for the growth of many food crops exist in the mountains and there is a need to exploit these opportunities for the economic well being of the people of the region. Multiple cropping, when used in the Himalayan region, increases the total production per unit area by making an efficient use of the available nutrients. The constraints, as pointed out earlier, are consolidation of holdings, irrigation, marketing, diversion of the prime lands to non-agricultural uses etc. and these have to be taken care of before any strategy for agricultural development is implemented. Due to inconveniently located and fragmented land holdings, the land is often abandoned. This, coupled with the lure of outside employment, brings about migration from the hilly rural areas resulting in land abandonment and loss of its productivity. Water being plenty in the hills, the only problem is its collection, management and harvesting. Thus, all land based activities should be planned on the 'watershed' concept for sustainable development of natural resources.

5.1.4 The other problem in the technology transfer is the gender factor. Although women carry out almost all the operations in crop production, the extension workers are largely males. This problem can be solved by giving training to male population for the skilled work and by recruiting the females as extension workers. Latest technologies in drip irrigation, strip cropping, relay cropping, alley cropping, not properly known in the Himalayas, must be introduced. One of the reasons for non-popularisation of chemical fertiliser is the inconvenient size of bag, which is heavy and difficult to transport at the site operation in the hilly areas. It is to be reduced in weight as most of the farmers own small land holdings and the existing bags contain more chemicals than what is required. The concept of Integrated Pest Management is very important for crop and fruit production in the hilly areas. Agricultural development which includes both departmental and organisational approach, where all disciplines and organisations work in a coordinated fashion at every level seems to be lacking. For this, firstly a homogenous geophysical area-wise or community development block approach is required; at the same time the preparation of a resource inventory of the area is also necessary. Secondly, infrastructural and back up strengths as well as weaknesses of the particular area should be known on a comprehensive basis at the district level. In the North Eastern States, proper conservation practices

of terracing, bunding must be undertaken. New and improved inputs like the improved seeds, fertilisers, pesticides etc. have to be introduced in the hills. Another very important measure to be undertaken is the credit availability to the farmers, which is poor at present. There is a need to look into the problems and procedures for providing credit for agriculture and allied activities especially with reference to land tenure system and gender issues. Women perform almost all the field activities and make decisions in this regard. However, they are not eligible for credit. Similarly, in many areas, land rights do not rest with an individual and as a result, the commercial banks do not advance credit to an individual. These are very serious matters and need immediate corrections to improve the investment environment for increasing the productivity of land in these areas. Fruit and vegetable production and processing, various types of soil conservation and animal husbandry being highly labour intensive can provide additional employment opportunities. Another important revenue earner could be the off-season vegetables like chilli, potato, tomato, capsicum, french bean, pea, onion and cabbage. The existing animal stock which is of a poor quality has to be improved through the introduction of good breeds like the murrah (buffalo), jersey red sindhi (cow). Their improved breeds should be given good fodder like the bhimal leaves and leguminous fodder.

HORTICULTURE

5.2 Some Himalayan regions have surplus production of horticulture materials and there is a possibility of converting these into various value-added products such as juices mixed with aerated soft drinks and jams, jellies, pickles which could be bottled or canned. Several types of fresh fruits, dry fruits, vegetables, flowers, vegetable seeds, mushrooms etc. have a great potential for further horticulture development. Apple, peaches, cherries, leechies, strawberries, apricots, pears, spices, ginger, chillies, turmeric and a variety of vegetables can be grown remarkably well in the Himalayas for the economic upliftment of the people. The low volume, high value crops along with cherries, oranges, pine apples and bananas can really prove an excellent source of revenue and would be ideal for environment-friendly development of the regions. Even in conditions of remoteness, poor accessibility and lack of proper communication in the Himalayan region, these products will add to both revenue and nutrition to the people. Besides these, animal husbandry and bee keeping can also play an important role in the economic upliftment of the people. Bee keeping particularly, is most suitable for these areas for it is less capital intensive and has a large potential for its product (honey) in the market. If proper training, the supply of bee boxes and marketing inputs are provided to the local unemployed youth, then the results can be spectacular as has been demonstrated in the Punjab and other states.

5.2.1 The nut trees are immensely suited for the Himalayan regions due to their long keeping quality. So far, the possibilities of the nuts such as walnut, hazelnut, pecanut have not been explored properly. These nut trees do not

produce perishable fruits and hence the problem of their immediate transport does not arise. Other nuts such as wild apricot and wild peaches also give precious edible oils. The biggest constraint in the horticulture development has been the existence of very few nurseries in the Himalayan States such as Himachal Pradesh, Jammu & Kashmir and North Eastern States. The seedlings of the nut trees are difficult to get. Establishment of horticulture nurseries for nut and other commercially viable trees in the Himachal and Uttar Pradesh regions will have to be provided, if eco-friendly and sustainable development of the region is to take place. The production of fruits on a commercial scale has not been attempted for the entire Himalayan region. For example, the apple production is restricted to Himachal Pradesh. There is hardly any long term horticultural plan or scheme which may indicate a long term perspective in the area as a whole. Similarly, research and extension as also processing and marketing, do not seem to have been evolved properly for the Himalayas.

5.2.2 The private sector has also failed to provide adequate cold storage facilities or any other type of linkages in the development of horticulture. The Ministry of Food Processing Industries has also expressed that there are some difficulties, largely the local ones, in persuading the private entrepreneurs to adopt the desired activities. The off-season vegetable cultivation is a supplementary means of income generation which has not been given the importance it deserves. There are as many as 20 species of cucurbits which grow naturally in the hills, but their overall potential remains untapped.

5.2.3 Similarly, the production of olives in some areas of Himachal Pradesh, or in Darjeeling (West Bengal) or in the North Eastern Regions may become a very lucrative venture. The high-value, low-volume agro-products may prove an asset for the hill people. The self employed young entrepreneurs have not been encouraged in the field of fruit growing, because planting material, credit or cooperative support have not been easily forthcoming for them as incentives. Perishable and high value fruits like the strawberries have not maintained their sustained and assured supply in big cities. Market intervention groups for coordinating and taking care of the marketing aspects of the horticultural products are almost non-existent in these areas. The latest technique of tissue culture for commercial horticulture is being slowly encouraged.

Jhum Cultivation

5.2.4 The Expert Group specially feels that the practice of shifting cultivation or in the North Eastern Himalayas must be controlled. The development of terraced land and the use of technical packages devised by the ICAR, are required for the jhum control. The technology development can be adapted to suit local conditions.

5.2.5 The practice of shifting cultivation or jhumming in the North-Eastern Himalayas has significantly changed and has become a major matter of concern. However, one must note that the function of jhum was to introduce a food chain

and improve the soil fertility through periodic felling of biomass. Food security was thus obtained through mixed cropping with different maturity periods. The jhum practice should now be replaced with what is now currently called "SALT" i.e. Sloping Agricultural Technology. The ICAR has developed such technical packages based upon their agro forestry research. A lot of work has also been undertaken in other countries like the Philippines and Indonesia and under the SALT programme of ICIMOD in Nepal, China and Bangladesh. It would, therefore, be necessary to benefit from the experience of other countries. The GBPIHED which is the nodal agency should play a lead role in getting the appropriate technology for the different regions of the Himalayas in operation.

OTHER AGRI-ALLIED ACTIVITIES

5.3 Agricultural development in the Himalayan region is characterised by extremely small land holdings and very low land: man ratio. Due to migration of the menfolk from the region seeking employment in the plains and outside of region, in several areas, agriculture is predominantly in the hands of women. The issue in agricultural development process is critical. Special efforts are needed to focus the appropriate agriculture production technology for hill women including their credit requirements.

5.3.1 Given the topography of the area, the rainfall, particularly in the mid hills and higher reaches, agriculture development, defined in a comprehensive way, may have to be quite distinct. Raising of the seasonal crops without proper terracing, an expensive proposition in any event, makes agriculture operations prone to large scale top soil erosion and unregulated surface run-off leading to degradation of land. Agriculture development may essentially centre round raising perennial vegetation in the form of horticultural crops, fuel and fodder trees and pastures to support animal husbandry programmes etc.

5.3.2 Further agro-forestry and sericulture could also be promoted both from the points of view of increasing the income through high value generating enterprises as well as maintenance/upgradation of ecological balance.

5.3.3 A systematic attempt at the development of perennials should be fully backed up with research in terms of tree cropping systems and species to be grown should be worked out. A master plan for the development of horticulture, sericulture and other tree based farming system, should be prepared in a time bound manner.

FORESTS

5.4 Forests form the major resource of the Himalayas. The main focus on the forestry activities has been on timber harvesting and policing on illegal felling without the least concern on yield regulation and regeneration of forests. Forests are replenishable resource like all biological stocks such as agriculture, livestock rearing, fisheries etc. The plants which are removed from the forests are replaced by reproductive process which goes on simultaneously. Thus the science of management of forests which is known as "Forestry" has two major

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components "felling and regeneration". In order to make forestry sustainable, the two components must balance each other so that the forest system remains stable. This plan does not include firewood production which falls under limited area, kept separately for this purpose. For the main forest, a rotation system of 30 or 50 years, by which time the required girth increments in the trees are achieved.

The other important activity of the forest management is to identify the right trees for felling and this should be done by a knowledgeable person and each tree should be marked. The general plan for marking the trees should be as follows:

- 1) Trees marked for felling should be evenly spaced.
- 2) No felling should be carried out on steep slopes.
- 3) No tree occurring solitary with deficient regenerative power should be felled.
- 4) Where regeneration is slow or insufficient at least 10 healthy trees are retained per hectare as "Seed trees".
- 5) No felling should be carried out within a distance of 40 metres on either side of a river or a large stream.

5.4.1 Forests in the Himalayas are being used at a faster rate than their regeneration rate. The fact that the tree cover is declining continuously at a fast rate is indisputable. The exploitation of forests is for fuel, fodder and other domestic needs not only of the hill people but the demand of wood in the plains is so great that clandestine selling of wood has become a most lucrative business. There are incidences of poorly stocked forests in well managed Government owned forest lands suggesting some fundamental and serious lapses in the forest management system itself. With an increasing demand for food, shelter and human habitation and industrialisation, the demand for favourable sites for such activities has increased leading to progressive shrinking of the forests. Treatment of forests as a free natural resource, by the local population has been continuing from the time immemorial and if alternatives are not developed it may continue to remain so. In this scenario, the prospects of the established convention that 2/3 of the land area should remain covered with forests looks bleak and extremely difficult to maintain. For the development and maintenance of forest cover and for using the full potential of the forests, it is suggested that the man-made forest should be as close as possible to the natural forests. The productivity of this resource has to be increased to higher levels than the demand of the people, so that it could supplement the cash requirements of the community. The standardized pine or eucalyptus, seem hardly to fulfil the requirements of the local population. **In a subsistence economy, if these basic needs are not met, then the people may be forced to resort to all kinds of means and meet them at all costs and risks - legal, environmental and agitational.** Old practices, like burning of the fallen forest leaves (pine needle) have to re-examined as these may be used for making boards, giving employment and reducing the

forest damage. Very little work has been done on the Indian tree species, on their seed physiology, nursery practices, transplantation etc. Hardly any technology is available in this sector. The reserved forests, administered by the State Forest Departments, as per the satellite imageries, have only 50% of the desired density left. Civil, panchayat and other grazing lands have been over exploited. They are under severe biotic pressure and accentuate the problem of silt load. In the alpine areas, all accessible sectors like the pastures, culturable and unculturable wastelands are open for grazing. Trampling and browsing by the animals play havoc with the vegetation cover. The juniper and birch trees have vanished as the local inhabitants are busy in cleaning all types of shrubs and thorny bushes along with their roots for fuel. Soil erosion in its worst dimension is the result of all these activities. The situation is further aggravating with the construction of roads and blasting. This has devastating effects on the top soil, and the rocks underneath and the vegetation of the hills.

IRRIGATION AND WATER MANAGEMENT

5.5 Irrigation for raising crops is a must. This problem has to be tackled on the basis of command area development approach in major/minor irrigation projects. Besides this, the problem has to be solved by groundwater development and micro-level water management strategies. Maintenance of "Gools" and hydrams needs emphasis in water management for hilly areas.

5.5.1 Provision of irrigation in the hilly terrain is not simple. Presently a system of diversion of water for the irrigation of crops in the slopes is being resorted to. Technologies for irrigation practices should be systematically studied and extended under appropriate programmes to the farmers.

ENERGY DEVELOPMENT

5.6 Taking into account the fragility of the Himalayan region, the potential for renewable energy must be tapped. The emphasis at present is towards the use of non-renewable fossil fuel. This endangers the environment. Even the hydroelectric projects, which are being recommended as an ultimate goal must be cautiously examined vis-a-vis the social cost benefit and keeping the environmental degradation as another yardstick. The need for preferring the mini and the micro-hydel projects of the size of 200-300 KW to 10 MW cannot be overemphasised. Hydel power potential is immense in the Himalayas. Fullest use of the hydel potential requires to be addressed squarely and in this it may be mentioned that a proper feasibility of the energy projects must be carefully evaluated after taking all these precautions into consideration in the catchment areas.

ROADS AND COMMUNICATION

5.7 The most important requirement of all the hill state is transport and communication. Without proper accessibility to the villages and far off places,

no economic activity is possible. From accessibility, it is not expected that everywhere there should be motorable roads. Even wide footpaths where trollies could reach is considered enough for the present.

5.7.1 Only necessary road accessibility linkages are required in these fragile mountains to save them from permanent destruction. More so, it is to be recognised that investments in roads/railways etc. do not create direct sources of State revenue. But in view of the rural oriented economy of the country, all villages or groups of villages with a population of 500 and above should be connected with all weather roads. The network should be so developed that no village should remain farther than 5 km from a road. Some of the precautions to be taken during the road construction should be: no geological disturbances, no land degradation or soil erosion, no interruption in drainage pattern, no unnecessary loss of forestry and vegetation, no aesthetic degradation, no such activity leading to flash floods or leaching of soil nutrients.

5.7.2 The other important need of the inhabitants of the hilly areas is the availability of food in all weather conditions. During the winter months or when the weather conditions are bad for prolonged periods, food becomes scarce. This is a common feature in most areas where agricultural land is limited. Easy accessibility of the place is linked with the food availability and this should be kept in mind for the development of infrastructure.

INDUSTRIALISATION

5.8 During the post independence period, there have been very large Central investments in the field of industrial development. Consequently, the Himalayan belt has also seen a fast growing industrial sector. The discovery of the rich raw materials, natural resources, cheap human labour, availability of energy, development of new power projects, roads and other means of communications, have contributed largely in the field of industrial growth. The promotion of industries, therefore, has increased the demands for water as an industrial raw material. The industrial development has also affected the environment adversely. Problems like pollution, noise etc. have adversely affected the people. Untreated industrial effluents are being let out in natural streams. The choice of technology, very often, did not match the socio-economic and topographic conditions of the hills. With practically no industrial training, sophisticated industries like the pharmaceuticals, watch making, thermometer making etc. have not made any perceptible contribution to the hill economy. Another paradox faced in the hills is that, as soon as the training is imparted and completed, the trained manpower migrates to other industrial places. With the industrial growth, depopulation and land abandonment phenomena occur leading to more and more pressure in the areas adjacent to the urban centres. On the other hand, environment-friendly industries such as food processing, local craftsmen, handicrafts which were contemplated most enthusiastically at one time, have not come up.

5.8.1 Himalayan region being endowed with bountiful resources of water/hydro-power, minerals, forests, cool and dust-free climate, is suitable for setting up of agro based, forest based, food processing, beverages and electronic industries, with the changing needs of the time and to speed up the process of development and industrialisation. Attention has to be paid to traditional, cottage and handicrafts industries for preparing a base for the development of entrepreneurship for subsequent industrial development in the region. To provide infrastructure facilities to the entrepreneurs, industrial areas have to be established at different places in the Himalayas.

5.8.2 The new industrial policy announced by the Government is aimed at a rapid, balanced and simultaneous growth of cottage, tiny, small, medium and large industries and service establishments in a well dispersed manner. Keeping in view the geographical, topographical, demographical and other production factors, the agro-horticulture produce based industries, sericulture and electronic industries are declared as priority industries under the new industrial policy.

5.8.3 A significant thrust in the industrial activity, particularly in the medium sector has not come up so far primarily on account of the power shortage, lack of adequate communication facilities and marketing problems. Availability of power, capital and technology constraints have also contributed in this regard. There are also limitations on account of environmental considerations and the type of industries which the concerned state Governments have to choose. A state-wise position of the industrial sector is described below:

5.8.4 In the Jammu & Kashmir State, the thrust is to develop high value/low volume industries like electronics, precision instruments etc. There is a State-owned cement plant of 600 tonnes per day capacity which is planned to be expanded by adding another capacity of 300 tonnes per day. Besides this, a massive expansion of the village and small industry sectors including the handicrafts, handlooms, sericulture and khadi has been planned. The State Financial Corporation is being expanded for giving a wider coverage to the industry. In 1992-93, 6% of the state annual plan outlay was earmarked for the industrial sector (Source: Annual Plan discussion paper for J&K, 1993-94).

5.8.5 In Himachal Pradesh, the share of manufacturing industry in the Net Domestic Product (NDP) has increased from about 4.4% in 1980-81 to about 9.3% in 1988-89. The Net Domestic Product has increased from 35.5% in 1980-81 to more than 60% in 1988-89.

5.8.6 In the North Eastern State of Meghalaya, the State Government has directed its efforts to create infrastructural facilities and the Meghalaya Industries Development Corporation (MIDC) is engaged in promoting and developing the industries in the state.

5.8.7 In the other North - Eastern sector, there has been virtually not much progress. There are only 155 large and medium-sized state industries

in this region, of which, 116 are in Assam only. The contribution of the manufacturing sector as a whole to the economy of these states is negligible and the capacity of employment generation is feeble and poor. Apart from the conventional reasons put forward for the lack of industrial growth such as distance from the market, poor infrastructure, transport bottleneck, instability, lack of credit etc. a major cause could be the high trading margins for commerce which have inhibited investment in the industries. Only public sector units can be counted among the large industrial units, which by their large spendings and purchasing power have been instrumental in generating substantial public employment and a thriving tertiary sector. Low returns on the industrial investment are common features in the Himalayas. For instance, in Sikkim, in the small and medium industrial sectors, the thrust has been laid on two things, first being the employment generation and secondly the "high value low volume" products. During the Seventh Plan period, a number of industries for manufacturing vanaspati, paper cartons, HDPE bags have come up. Small units for cattle feeds, television assembly, telecom power, silica chips, ayurvedic medicine etc are some of the other units which have been set up. During the Eighth Plan the thrust is on the development of electronics and food processing industries.

5.8.8 Handicrafts like wood carving, bamboo carving, horn products, metal casting, filigree works, painting and patch works, Lepcha weaving are some of the promising cottage industries, being developed and practised in these hills. Besides these, for carpet weaving, encouragement and training centres have been opened by the local hill Governments. In the follow up programme for self employment, the cooperative societies of ex-trainees are being formed. The hill designs in the carpets are being liked even in foreign countries. Marketing has been the major problem in the development of handicrafts in the region. There are middlemen and mahajans associated with the hill artisans, affecting them badly because the traders make payment and give advances to them, and after the material is produced, purchase them at a very low price. This requires immediate remedial measures. This issue can easily be settled by opening some cooperative sales emporia.

5.8.9 For developing cottage and small scale industries in the hill areas, schemes like (i) construction of artisans sheds (ii) training centres (iii) financial assistance to cooperative societies (iv) modernisation of design centres (v) opening of marketing outlets and centres etc. are required.

TOURISM

5.9 The Himalayan region is considered to be abundantly suited for tourism and it offers all kinds of attraction to tourists. The benefits of tourism, however, must be used for the overall development of a region without any adverse impact on the environment. Tourism has been declared as an industry and the benefits of this industry are availed through what is termed as eco-tourism. There has been emphasis on the five star tourism while the middle income group people have not been paid attention. The so-called invincible Himalayan wall has no

longer remained invincible now. Instead, people trek to any part, even in the inaccessible innermost parts of the regions. Mountain ranges such as Kanchenjunga, Dhaulagiri, Nanda Devi, Naga Parbat, Dhauladhar, Pir Panjal etc. are known to beckon to the people of India. It is not only because of the social and cultural life of the people of India but also the religion, the mythology, art and literature that bring hundreds of people to these lofty ranges. The Himalayas are known to be a paradise for anglers and a challenge to hikers. The lush green valleys, emerald meadows, vast ice fields have now started showing the abrasions due to increasing human activity. Hill resorts like Pahalgam, Gulmarg, Shmilla, Dalhousie, Kangra, Kulu, Mandi have become more or less look akin to modern day slums during the peak summer season. To accommodate the large tourist influx, hundreds of new buildings are being constructed every year. The fast growing trends in the technological prospects lead to dramatic changes in the socio-economic structure of the societies leading to accelerated tourists inflow. These demand the protection and conservation of environmental resources in a big way which the tourists, in their wanton and holiday mood, very often erode. The tourist activity has not remained subservient to and in consonance with the principles of conservation of nature and with the protection of associated genetic resources. Unplanned urban development in the Himalayas is causing irreparable damage. Local ethics, culture and ethos of conservation are facing an onslaught as a result of the transitory tourist population. The problem of litter, noise, erosion, destruction of fauna and flora have become acute. More and more incoming vehicles pollute the atmosphere with the emission of carbon-monoxide, sulphur-dioxide etc. Garbage problem is another Himalayan task to solve. Diseases like cholera, typhoid, dysentery have become common features due to contamination of rivers and streams and improper sewerage. Dal Lake of Kashmir is a typical example to be cited as a pointer.

5.9.1 During the past 40 years the number of foreign and Indian tourists has been increasing 4-6 times every 5 years. Normally people go to the hills during summer to escape the heat of the plains, for rest and for enjoying a holiday. The impact of tourists on the prosperity of a hill station has been profound. However, whether such a rapidly developing tourists industry has a wide-ranging adverse effect on the ecology is difficult to evaluate, although there is a strong group of activists who would not like the place to change drastically. This group prefers to maintain the place as it was some 25 or 30 years ago, because according to them any socio-economic activity like tourism will have an adverse effect on the environment. Tourist industry needs a lot of infrastructure in the way of 5-star and lower class hotels and other kinds of holiday resorts. The place needs other services such as good food, drinks, better transport facilities and well-laid out programmes for tourists attraction to places of interest. We must take measures to improve the socio-economic conditions of the people which could bring in prosperity without drastically changing the ecology. Therefore, tourisms of different types must be promoted in the hill regions.

TRIBALS AND EDUCATION

5.10 The crux of the whole problem of development in the Himalayas is looking after the needs of the people. As pointed out during the meeting of the Expert Group in Shimla by the Chief Minister of Himachal Pradesh, the ultimate goal of all development is the welfare of 'man'. In fact, the rapid pace of education is evident from the fact that female literacy rate in all the North Eastern States is well above the all India average, as the following table will show:

Table: 8
Literacy Rate in NE Region

State	Literacy Rate (%) (1991)	
	Male	Female
Arunachal Pradesh	51.10	29.37
Assam	62.34	43.70
Manipur	72.98	48.64
Meghalaya	51.57	44.78
Mizoram	84.06	78.09
Nagaland	66.09	55.72
Tripura	70.08	50.01
All India	63.86	39.42

5.10.1 Due to fast expansion of the educational infrastructure in recent years, higher and technical education has also become within reach as the following table will indicate.

Table:9
Number of Educational Institutions in seven Hill States
(as on Sept. 1990)

Institution	Aruna- chal Pd.	Assam	Mani- pur	Megha- laya	Mizo- ram	Naga- land	Tripura
Universities	1	3	1	1	*	*	1
Board of Secondary Education	-	2	1	1	1	1	1

Contd.....

Table 9 Contd.....

Art/Science and Commerce Colleges	4	213	31	23	13	15	13
Engineering Colleges	-	3	-	-	-	-	-
Medical Colleges	-	3	1	-	-	-	-
Agriculture Colleges	-	2	1	-	-	1	-
Veterinary Colleges	-	1	-	-	-	-	-
Teacher Training College	-	9	3	1	1	1	1
Junior Colleges (+2 stage)	1	11	10	-	3	1	
Higher Secondary Schools(10+2 pattern)	45	367	30	-	-	-	148
High Schools	68	3065	400	303	202	147	306
Middle Schools	254	5703	693	693	544	341	436
Primary Schools	1122	28876	3226	4163	1109	1287	2083
Pre-primary Schools	249	482	1	1165	-	-	2513
Teachers Training Schools		32	2	10	2	3	2
Polytechnics	2	7	1	1	1	1	1
Technical and Industrial School	2	27	19	3	1	3	3

5.10.2 The origin of Indian Scheduled Tribes has been traced to such races as the proto-Australoids, Mongoloids (Assam and North-Eastern India) and Negritos (in other parts of India). These tribes are the earliest inhabitants of the country and due to continuous pressure from the outside settlers, they moved away and took shelter in the mountain regions and thick forests. They still are found in forests in considerable numbers. Though their original tribes are divided and subdivided, considering their endogamous and exogamous clans, they have the following common features:

1. They live away from the civilized world in inaccessible parts lying in the forests or hills.
2. Speak their own tribal dialect.

3. Follow primitive occupations.
4. They are largely carnivorous.
5. They have nomadic habits and have love for drink and dance.
6. Profess primitive religion known as 'Animism' in which they worship natural phenomena.

5.10.3 The population of the Himalayan States, particularly in the North-Eastern region largely consists of Scheduled Tribes. Major Tribes of the North-East India are Adi, Apatani, Chakma, Garo, Hajong, Halam, Hill Miri, Deori, Chiru, Barmans, Anal, Hmar, Jamatia, Kachari, Khasi, Kabul, Kuki, Nishang, Nocte, Rabha, Riang, Tagin, Tangkhul, Tangsa, Tripuri, Wancho, Zou etc. Thus the North-East India is the homeland of a large number of tribes which are very broadly put under the common bigger ethnic group called the Indo-Mongoloid.

5.10.4 Because of their isolation, the tribal communities have lagged behind the mainstream of the country's developmental activities. Therefore, considerable effort is needed towards their education, health, welfare and economic development.

5.10.5 The fact remains that there are already seven universities in the North Eastern Himalayan region and after taking into account the two Central Universities, one agricultural university and two deemed universities which are in the offing, the region has the highest ratio of universities and technical institutes for a total population of 38 million people. Besides this, the hills have been the traditional providers of good education and some very fine institutions have been located there. These are producing educated youth at a fair speed. Thus, in this process, a large educated middle class has been created.

5.10.6 But with the unmatched development in the core economic sector, the aspirations of the local literate people have not been met. Education and urbanisation are usually thought to be a consequence of the growth of large-scale industries, expansion of administration, development of transport and communication and growth of trading activities. The hill areas, on the contrary, have hardly experienced any major industrial activity. By their very nature, these fragile hills are not suitable for the development of large industries. Agriculture also is carried out in a scattered manner and it is not productive enough to generate surpluses, and therefore, large scale trading activities in the agricultural products are not possible. The tea industry, which brought about urbanisation, is also facing stagnation due to problems of unprofessional management. A number of tea gardens have become sick and uneconomical. In Himachal Pradesh, the flourishing apple industry has brought a lot of prosperity to the State. However, apple being a perishable commodity, unlike tea, faces considerable difficulties in packing and transport to reach the consumer markets all over India. It also has the enormous problem of middlemen who join hands in declaring the wholesale price or during auction of the apple. The result is that both growers and the employees of the apple industry do not get the proper rewards of their labour.

Moreover, there are other problems connected with pests and insects including the inclement weather which hits the industry quite hard at times. These features do not enlarge the employment potential.

5.10.7 The service sector has been historically associated with the tea plantation and with different Government jobs. In the past, the service sector was the main sector for the development of economy. With the introduction of "other services" such as transport and storage, and trade and commerce, the occupational pattern has changed. The shift of population from the other sectors to these sectors may be due to the lack of employment opportunities in the organised sectors in the urban areas. It has been noticed that as people do not get an opportunity either in the offices or in the administration and other service sectors, they open a small shop for their bare existence. Innumerable retail shops in the streets of the hill towns reflect the stagnation of the urban economy. This is the general pattern of disguised unemployment in the hilly areas of India.

5.10.8 The trade sector has been dominated in the hills mostly by those who are engaged in exporting cardamom, oranges, potatoes and practically all other important consumer goods. The retail trade of consumer goods is also under their total control.

5.10.9 In the latest census, it has been brought out that the number of non-workers in the eligible age is very high in the urban areas. This means that unemployment is very high in the towns. Further, in all the tea areas, the proportion of non-working population is higher than in the agricultural areas. Thus, a large number of people have remained "unemployed" even in the tea areas.

5.10.10 Both disguised and seasonal unemployment amongst the working population has become rampant. The climatic factors may also be responsible to a certain extent for the seasonal unemployment. Except tea and apple, there is no major or medium-sized industry which can absorb the surplus agricultural family labour.

5.10.11 Special schemes like the Additional Employment Schemes, Crash Schemes, Special Employment Programme along with the other programmes have been introduced for providing meaningful work to the people. Similarly, tourism considered as "the industry of the future" has also not shown promising results. Tourism has certainly come up as a survivor in many fringe areas and it constitutes the backbone of alpine economy. Approximately half of the working population of these regions is employed in the tourism sector. In the popular holiday resorts, tourism has emerged as the major revenue earner. But the number of foreign tourists visiting these hills is proportionally low and the problem of unemployment has led to a number of social and political tensions in the area. Massive development of infrastructure such as roads, power, water supply etc. is required for giving a big boost to tourism. Horticulture is another eco-friendly sector which can solve the problem of unemployment a great deal. Due to a variety of reasons including the glamour for the city-based jobs and employment in the armed forces,

the menfolk migrate out of the hills. These menfolk finally come back to the region after their retirement.

5.10.12 A cautious approach has to be taken for tourism, as the goal of tourism has been to patch up economic and social disparities between the highland and lowland regions, but instead of doing so, it has increased the gap. In fact, tourism destroys tourism. Because the rent on the landscape is paid for, but the long term costs of its preservation are not. The long term ecological processes have to be foreseen at the plan formulation stage for maintaining a healthy inter-relationship between ecology and economy.

HEALTH, NUTRITION AND FAMILY WELFARE

5.11 The health, nutrition and population scenario of the Himalayan region require consideration from the following two angles -

- (a) Prevalence and causes of morbidity and mortality on account of special geophysical, geoclimatic, socio-economic and other factors present in the Himalayan region.
- (b) Inaccessibility of health services due to inadequate infrastructure, non-availability of health personnel in sufficient numbers, poverty, illiteracy, poor communication, etc.

5.11.1 The diseases which require special consideration for the purpose of formulation of a National Policy for an integrated development in the Himalayas are endemic goitre, cretinism, malaria, respiratory disorders, parasitic infestation like hookworm, STD and AIDS.

5.11.2 Realising the magnitude of the problem of goitre, the Government of India launched a Centrally Sponsored Scheme known as National Goitre Control Programme in 1962. The survey results indicate that the manifestation of iodine deficiency is not only limited to endemic goitre and cretinism, but includes a wide spectrum of morbidity and disability including deaf mutism, mental retardation, various degrees of neuro-muscular and locomotor dysfunction, higher incidence of foetal loss, etc.

5.11.3 The world's most intensive endemic goitre belt runs along the slopes, foot hills and the adjacent areas to the south of the Himalayas, extending over 2400 km from Kashmir in the West to the Naga hills in the East. The Himalayan endemic belt involves the States of Jammu & Kashmir, Himachal Pradesh, Punjab, Haryana, Uttar Pradesh, Bihar, West Bengal, Sikkim, Assam, Mizoram, Meghalaya, Tripura, Manipur, Nagaland and Arunachal Pradesh.

5.11.4 In the North-Eastern States, a significant increase of HIV infection among I.V. drug users was noticed initially in 1990 in Manipur. This has now been found to engulf Nagaland and Mizoram as well. The latest status has shown the HIV prevalence among the injecting drug users from 54 to 74 in Manipur, 50 in Nagaland and 6-10 in Mizoram. For an effective implementation of the National AIDS Control Programme, an integrated strategy to tackle the problem

of drug abuse and AIDS Control needs to be developed for this region keeping in view the mode of transmission in these areas. The high incidence of STDs in some areas is known to be associated with the local customs of polyandry and polygamy. Strengthening of the STD Control Programme in this region is, therefore, very necessary. This is more so because the presence of STD predisposes an individual to higher risk of HIV infection.

5.11.5 The tribal areas of the country both in the hinterland as also in the North Eastern Region have paid the highest price in terms of morbidity and mortality caused by malaria. This is mainly due to inadequate health infrastructure, poor communication facilities, socio-economic backwardness resulting in poor housing, malnutrition and illiteracy. Forest-based living, coupled with a poor health infrastructure, has led to uninterrupted malaria transmission. The position is compounded by the predominance of Plasmodium falciparum cases which are associated with higher fatality and drug resistance.

5.11.6 It is, therefore, important to launch an intensified malaria control programme in the Himalayan areas, specifically in the tribal areas, with emphasis on the development of health facilities, early detection and treatment of the cases to break the chain of transmission and vector control with safer insecticides. Special emphasis needs to be given to the care of high risk population namely pregnant women and young children.

5.11.7 Bronchitis, asthma, measles and acute respiratory infections are more common in the region because of favourable predisposing climatic conditions. In view of difficult terrain and under-developed health infrastructure, there is a need to strengthen the immunization programme in the region, since the target achievement of immunization from the measles varies from 29 in Meghalaya, 45 in Arunachal Pradesh, 62 in Jammu & Kashmir to 90 in Himachal Pradesh.

5.11.8 In the context of prevention and treatment of the various diseases in the region, the Indigenous Systems of Medicine can play a vital role. These systems, besides being popular among the population, have stood the test of time and proved their efficacy over the generations. The development of these systems and their integration with the mainstream of health care delivery is one of the priorities of the Eighth Plan. Particular stress requires to be laid on the collection, cultivation, preservation, and standardisation of the medicinal plants for the use by the Ayurveda and Siddha physicians, and the protection of musk deer in farms. The Himalayan region could play an important role because this region is most suitable for efficacious medicinal herbs and the sole source of musk deer in the country. The Ministry of Health and Family Welfare has held some discussions/seminars in this context in Manali (HP), Guwahati (Assam), Nainital (UP) etc. for the quantification of medicinal herbs. The CSIR, ICAR and ICMR along with the Ministry of Health & Family Welfare have to play vital role in this regard.

5.11.9 In terms of development of rural health infrastructure in these states, the population based normative goals have been satisfactorily achieved. The

Seventh Plan target for the creation of sub-centres and Primary Health Centres have been achieved by all these States except J&K and Meghalaya (only in the case of sub-centres). However, certain areas and populations in far flung places still remain under-served by the health infrastructure. Moreover, consolidation activities, as envisaged in the Eighth Plan document, are rather slow in these areas. Major shortfalls are in the area of buildings to house the Sub-centres in the states of Assam, Manipur, Sikkim & Tripura and in case of PHCs in the states of Himachal Pradesh and Manipur. For the completion of infrastructure, the resources under the Rural Development Programme can be profitably utilised. There is also a need to step up the consolidation activities connected with the health in these areas so that the health infrastructure is properly operationalized. Taking into account the difficult terrains existing in the Himalayan regions accompanied by extreme weather and low population density, the optimum population and distance norms for the creation of sub-centres and PHCs need to be reconsidered.

Family Welfare

5.11.10 Though the Himalayan region is sparsely populated as compared to the rest of the country, rapid population growth in these areas has its own repercussions. The 1991 census figures for the North-Eastern States, Jammu & Kashmir and Himachal Pradesh (Table 10) show that the exponential growth rate of population (Expected Growth Rate) in each of these states is higher than the national average of 2.14 and it is as high as 4.45 in Nagaland and 3.34 in Mizoram. The population density in these States though still well below the national level is increasing rapidly as can be seen from Table 10. The increase in the population will result into more inhabited land and decline in the forest cover which may destroy the ecological balance of the area. On account of this, there is a special need to strengthen the family welfare activities in the Himalayan Region.

Table: 10
Population, Exponential Growth Rate (Exp.G.R.) and Density in
Himalayan States

	Population '000'	Exp. G.R.	Density	
			1991	1981
Himachal Pradesh	5171	1.89	93	77
Jammu & Kashmir	7719	—	76	59
Manipur	1837	2.57	82	64
Meghalaya	1775	2.84	79	60

Contd....

Table 10 Contd.....

Mizoram	690	3.34	33	23
Nagaland	1209	4.45	73	47
Sikkim	406	2.51	57	45
Tripura	2757	2.95	263	196
Assam	22414	2.17	286	230
Arunachal Pradesh	865	3.14	10	8
India	846303	2.14	274	216

5.11.11 In conclusion, it may be said that the Himalayan region represents a distinct entity, different from the other parts of the country, because it has a distinct geophysical, geo-climatic socio-economic, demographic and developmental characteristics different from the other regions. Thus, there is a need to understand more precisely the prevalence and epidemiological picture of the disease pattern prevalent in this area which can form the basis for launching of programmes for the control and prevention of common diseases. There is also a need to undertake operational research to develop models of delivery of health services, keeping in view the special characteristics and operational requirements of the area.

ENVIRONMENTAL EDUCATION

5.12 In India environmental education has been introduced at various levels. The goals of environmental education programme are:

- a) to improve the quality of environment and to create an awareness among the people on environmental problems and conservation;
- b) to create the necessary atmosphere to make it possible for the citizens to participate in the decision making;
- c) to develop capabilities to evaluate the development programmes of economic, political and ecological significance.

5.12.1 Environmental education is provided at the primary and secondary school levels. The National Council of Educational Research and Training (NCERT) has developed syllabi and curricula on environmental education at these two levels. At the higher level, environmental education is provided by the universities, research institutes, agricultural universities, institutions for planning and management, engineering colleges and a number of other agencies. Some of them have well defined programmes while others have included some components in their curricula. Several institutions have also provided multi-disciplinary programmes and very often these programmes are problem solving.

In recent years, some courses on environmental biology have been introduced in several universities. The Institutes of Planning and Management are developing training on environmental impact assessment to make the various developmental programmes environmentally sound and to make the concept of economic benefits linked with ecology.

5.12.2 In all ecologically fragile areas, and even more so in the Himalayan regions, there is an immediate and urgent need for the creation of a massive and widespread environmental awareness. This cannot remain largely confined through formal education. It must extend to every functionary connected with different types of development programmes which should be reoriented by conducting training programmes. The decision makers have to be sensitised on environmental issues. A closer involvement of the NGOs and peoples' movement in the creation of environmental awareness would make this process more effective.

5.12.3 Environmental education is multi-faceted and unlike in other disciplinary training programmes, it is an area where a large number of disciplines converge leading to the synthesis of a theme. Environment is an area which cuts across all the areas of development and the very life of the people. Therefore, environmental education must be tailored to every segment of the society. For the Himalayan region it should really begin with the school children in their formative years. India, amongst the developing countries has pioneered the preparation of education material by incorporating environmental inputs, to a large measure, in its National Education Policy and the curricula and reading materials prepared by the NCERT have been designed to meet such needs. Field visits, organised for the students, can bring home the message in a graphic manner which will also be of immediate relevance.

5.12.4 In the academic community, there is a serious questioning of the policy of treating environment as a discipline. There is also a proposal that the major environmental issues should be integrated in all the traditional disciplines such as physics, chemistry, biology, sociology, anthropology and economics both at the graduate and post-graduate levels. This approach could give the graduates the necessary inter-disciplinary skill to refine and sharpen through a set of themes and problems at the M.Phil/Ph.D levels. The Expert Group suggests that there should be an in depth review of the present methodology followed in the entire field of environmental education to subserve the broader objective.

CHAPTER - VI

INSTITUTIONAL ARRANGEMENTS

As evident from the previous chapters, the Himalayas represent a special case requiring urgent attention for their preservation and development. The conservation of the Himalayan fragile ecosystem is vital to both those who live in the hills and to the million who live in the river valleys that the Himalayas have created. This urgency is further compounded by the population explosion, fragile resource base, recent natural disasters and the absence of innovations coming from the institutions of the regions. The existing administrative and local institutions, as also the guiding plans from the Centre, have not stood up to the challenges of the Himalayan region. An integrated package, therefore, of the administrative reform becomes necessary for executing and overlooking the integrated development.

ADMINISTRATIVE PATTERN

6.1 India's administration has its roots in the revenue, law and order functions inherited from the British. As a result, large administrative agencies have arisen in the hill areas very similar to what is found in the plains without taking into consideration the special features of the hill areas. The PWD, Departments of Agriculture, Forestry, Transport and Communication etc. are good examples.

6.1.1 The debate over the best ways to be used for planning and execution has concentrated essentially on an appropriate administrative mechanism to be created. One may mention some of the important administrative arrangements evolved to deal with specific area or functional programmes, such as the Command Area Development Agency (CADA), District Rural Development Agency (DRDA), etc. The Himalayan characteristics of specialised regional topography, provide an opportunity to redraw the administrative units around natural resources areas, namely the catchments and the existence of common land which could be used for the good of the people, have not been taken into account fully in drawing up the schemes for implementation.

6.1.2 The economy of the hill states in the Himalayan region has been showing signs of retarded growth and not simply "under development" in the conventional sense. Stagnation both in the primary and secondary sectors, as well as the lack of technological and institutional change which can initiate growth momentum, augmentation of the capital and investment from outside the region, coupled with mounting population growth, have given rise to a crisis situation which requires immediate remedial action if the major problem of poverty is to be arrested. The following immediate measures have to be taken in order to prevent a serious situation arising in this region.

6.1.3 In the rural sector, the organisation for implementing the projects at the micro-level is weak as the bulk of the staff is located in the State capitals or in the district/sub-district towns. A process of shifting and deploying the technical and management staff to the field from the headquarters is urgently needed rather than further expansion of the staff exclusively for the field work. There is a need for reorganising the extension services with adequate linkages with research, and most important of all, by creating the micro-level project implementation capability.

6.1.4 Segmented and partial approach to rural development, each dealing with one aspect of economic life of this region to the exclusion of the others, has led to economic and ecological disequilibrium. An integrated view, therefore, of men, resources and environment must be made as a prerequisite for a balanced regional development. Consideration must be given to the links between different factors, the most important of which is the land and the other physical resources, infrastructural development, institutional arrangements and the availability of services such as marketing, credit, extension, research and adequate communication.

LOCAL LEVEL PLANNING

6.2 Organized and purposeful action plan arising out of the local needs and for resolving the perceived problems and conflicts is a must. This concept of planning has to take into account various local resources, not land alone, i.e. resource planning but also recognition of the societal claims for environmental preservations. Planning, as a primarily rational process, consists of two parallel but interacting streams. Firstly, an ordered, analytical scientifically based process, legitimised by public participation or local level participation. Secondly, the wishes and ideas held by the community at large, as well by the government about the right and proper role of the government. This is the most crucial component in planning. In this context, special interest groups have a vital role to play for making an impact on the decision making process. There has to be more public participation and consultation and local level planning as the public is still not involved enough in a participatory manner.

BUILDING ENVIRONMENT INTO PLANNING PROCESS AT THE STATE LEVEL

6.3 Integration of the environment in the development process aims at enhancing the goals of development and of anticipating the effects of developmental activities on the natural resources and environmental processes. Through preventive planning, based on research, monitoring and analysis of data, most of the adverse environmental consequences can be avoided. This process is peculiar to the hilly areas which are different from the plains. The policy planning and developmental works in the Himalayan region, for a balanced regional development, must take into account an integrated view of man, physical resources and environment. A coordinated action in all branches of social and human activity is required so that the overall development results from the

simultaneous and harmonious development of all its elements. Development of the hill community must be seen as a web of linkages between effective, coordinated technological aspects and the development at various levels in the spatial hierarchy such as the village clusters in a region. This process also involves multisectoral development in the rural economy. Examples are the sectors of agriculture, forestry, animal husbandry, industry, education, health and family welfare.

6.3.1 Himalayas represent an unique region. There is an urgent need to accelerate the socio-economic development in the region, while safeguarding the conservation of ecological balance. Himalayan region constitutes a fragile ecosystem on whose preservation depends the well-being of millions of people living in the hills as well as those in the plains watered by the rivers and streams originating from the Himalayas.

6.3.2 It should be accepted that the process of development in the region has been uneven. There is a large biotic pressure on the scarce land resources. Unemployment is a critical issue, often forcing the menfolk to migrate outside the region to earn their livelihood. In terms of provision of amenities, be that education or health, far more needs to make all types of basic human needs accessible to them, as is being done elsewhere.

6.3.3 The fragility of the Himalayan region requires a far greater scientific input in evolving environmentally sustainable development, which will meet the aspirations of the inhabitants in terms of goods and services available to their fellow beings living outside the region.

6.3.4 Modern science and technology have always found solutions to several problems of basic human needs. The development process should be guided by objective consideration based on issues and problems and tempered by the knowledge, science has to offer.

6.3.5 The Expert Group after a careful study of the various problems of the Himalayan Regions has been able to formulate a set of Recommendations. In doing so, the Group admits that the task given to it, both in size and magnitude, was enormous and it must accept its limitations because it could not devote as much time as it should have wished. It could not visit all the states of the Himalayan Region. However, it has been able to develop a basic understanding of the problems which are applicable to most states. It is hoped that these recommendations will provide an answer to many of the problems that these young mountains are facing today.

HIMALAYAN DEVELOPMENT AUTHORITY

6.4 Development of the Himalayas in an integrated fashion requires the optimum use of the mountain resources, sustained over several generations. The net result of all the efforts must crystallise in the preservation of gene pool,

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augmentation of the well being of the local people and sustainable development. Therefore, for overseeing and for a speedy implementation of the national policy for the integrated development of the Himalayas, the creation of an apex body at the national level is absolutely necessary. The authority should be named as Himalayan Development Authority. It should focus its attention on some of the major issues and evolve a policy framework for the Himalayan Region. The demand for such an apex body was highlighted and endorsed during the interaction of the Expert Group with the state governments and other top level functionaries.

CREATION OF HIMALAYAN DEVELOPMENT FUND

6.5 Most of the States in the Himalayan region, except Uttar Pradesh and West Bengal, have been categorised as Special Category States in deciding on the quantum of Central Plan Assistance (CPA). The terms and conditions of such assistance have also been framed. Eight districts of Uttar Pradesh and the Darjeeling district in West Bengal have been included in the Hill Area Development Programme (HADP), implemented by the Planning Commission. This provides additional CPA for developmental plans. In such an established situation, it would be difficult to propose any special measures in terms of funding for the States, as the CPA flowing to these States/regions would be governed by the overall availability of resources for the implementation of Five Year and Annual Plans. The Group feels that a special fund should be created to take up studies relevant to the region and for the innovative programmes which cut across the geographic boundaries of the States.

CHAPTER - VII

CONCLUSIONS AND RECOMMENDATIONS

RECOMMENDATION - 1

Constitution of Himalayan Development Authority (HDA)

The Group would recommend the creation of an Apex Body at the national level. Such an apex body called the Himalayan Development Authority (HDA) should be headed by the Prime Minister with Deputy Chairman, Planning Commission, the Ministers of the concerned Central Ministries/ Departments and the Chief Ministers of the Himalayan States, as a Policy Planning Authority. This could be assisted by a Steering Group headed by the Member in-charge of Environment in Planning Commission and associating Secretaries of the concerned Central Ministries/Departments and Chief Secretaries of the concerned States. If, however, because of the preoccupations of the Prime Minister, he is unable to chair the Authority, then it should be chaired by the Deputy Chairman. The Secretariat of the Authority should be the Planning Commission.

RECOMMENDATION - 2

Creation of National Himalayan Environment and Development Fund (NHEDF)

The Group recommends, that a National Himalayan Environment and Development Fund (NHEDF) would be necessary to accelerate the implementation of the National Policy for Integrated Development in the Himalayas. The Fund should start with a reasonable allocation and once its effectiveness and role gets established, the allocation should be enhanced suitably.

RECOMMENDATION - 3

Enlarged role of the Ministry of Environment and Forests(MOEF)

The Ministry of Environment and Forests must strengthen its role in the Himalayan region. It should have a separate Division dealing with the problems of the Himalayas in an integrated fashion. This Division must have competent staff members dealing with administration, management and scientific inputs leading to better quality of life of the people of the Himalayan regions. The G.B. Pant Institute of Himalayan Environment & Development under the MOEF should be used as a nodal agency to identify the problems to be effectively tackled by the Ministry. Similarly the Botanical Survey of India and the Zoological Survey of India should continuously monitor the biodiversity and the fate of endangered species of plants and animals. The Group will recommend that, if there is a

need, the MOEF should be provided with additional statutory responsibility and authority to deal with the implementation of the National Policy. There is also a need for considerable improvement in the management of National Parks, Sanctuaries and Biosphere Reserves spread in different parts of the Himalayan Region. These require, not only policing and vigilance but the enforcement of a proper scheme for the management of wild life. If the MOEF feels considerable difficulty in the management, a decentralised approach of making the States fully responsible for their protection may be considered.

RECOMMENDATION - 4

Linkages and Cooperation of Scientific Institutions

There are a host of institutions working in the country where work undertaken would be relevant to both development process and environmental conservation. The Government of India has established the G.B. Pant Himalayan Institute of Environment and Development (GBPHIED) as the Nodal Agency. It is, therefore, necessary that under the leadership role of the GBPHIED, an effective networking with the various other scientific institutions is systematically established.

It may not be easy to bring on one platform different scientific institutions working in different fields. There may be a vast diversity in the orientation of these institutions - educational, basic scientific research, applied sciences and technology generation etc. While some of the institutions are managed by the Central Government, some are run by the State Governments, others by autonomous bodies.

Nevertheless, in view of the critical importance of the Himalayan Region in several ways, it is necessary to create a mechanism where different scientific institutions can interact with each other. They may deal with any one aspect or several others of relevance to the development and preservation of the environment of the Himalayas. The Group recommends that the GBPHIED should organise get-togethers of the scientific institutions annually. The task before the scientific community is large enough to warrant pooling of resources be that manpower, infrastructure, etc. to undertake studies/research of immediate relevance. The possibility of creating a separate all India Association on the pattern of Agriculture Sciences and others called the Himalayan Region Scientific Association with its Headquarters in GBPHIED may be explored. It should meet annually at some selected place in the region.

RECOMMENDATION - 5

Interaction of Natural Sciences with Social Sciences

Many social factors have influence both on development and the manner in which the society looks at the environmental issues as also effective com-

munication to bring about awareness on the sustainability of the development paths being followed. It would be very useful if the Social Sciences are also dovetailed with the Natural Science and Technology inputs in bringing about environmental friendly development process of the Himalayan Region.

The Group feels that the country's socio-economic development should be seen as one comprehensive whole. Any integrated policy of the Himalayan region will be just a segment of the country's socio-economic development process. Islands of exclusiveness in the development of one region or the other may be socio-politically unsustainable. Any attempt at "we and they syndrome" would result in sub-optimality of the planning for development as also from the conservation angle.

The entire Himalayan region from the conservation angle must be broadly seen as comprising of three sub regions namely, lower hills, the middle hills and the higher reaches. These have significant variations in terms of flora and fauna and the kind of development measures required to be taken up. The Group, therefore recommends a proper interaction between Natural Scientists and Social Scientists in the Annual Session noted earlier.

RECOMMENDATION - 6

Preparation of Guidelines for Development Projects in States

By and large the states action in attempting an environmentally friendly development process may be seen to lie in two broad fields. The first relates to regulation process with a view to preserve ecology and environment. The second looks at programmes which seek to reduce the adverse impact of development projects on environment as well as those measures aiming at qualitative upgradation. The Himalayan Region has been considered as an ecologically fragile area. In this light the Group recommends that the Ministry of Environment and Forests must frame detailed guidelines on various considerations which need to be kept in view while providing environmental clearances for development projects under the Environment Protection Act, be that by the central or state Governments. It is necessary to make these guidelines transparent and enforced in a fair manner free from arbitrariness.

RECOMMENDATION - 7

Preservation of Biodiversity and Genetic Resources

The vast genetic diversity that exists in the Himalayan region, both of flora and fauna, needs to be preserved for posterity. In situ conservation of the genetic diversity and resources in many situations may be inescapable. However, declaration of any area as biosphere reserve and closing down the area from human interference can have substantial impacts on those living within or in adjoining areas.

The Group recommends a time bound programme for inventorisation of genetic resources in the Himalayan region under the aegis of the Botanical Survey of India and Zoological Survey of India. In this, the traditional universities and other academic institutions or agencies, must also be associated to complete this process in a well- defined time framework.

A fuller understanding of the flora and fauna and their propagation can assist in ex situ conservation of endangered species, wherever such measures are essential or desirable and feasible. A systematic attempt at the conservation of germ plasm and genetic resources must be attempted for which a detailed master plan must be evolved.

RECOMMENDATION - 8

Maintenance of Forest Cover

Maintenance of the forest cover and their upgradation through forestry programmes are matters of urgent importance. Under the Forest Preservation Act, diversion of forest to non-forest uses has been highly regulated. The Government of India has also laid down a policy of compulsory afforestation wherever diversion to non-forest purposes cannot be avoided. The Group recommends that it needs to be examined whether afforestation of degraded areas in the Himalayan region could be accelerated under this policy even by the deployment of resources to be provided by projects being taken up not essentially within the same states. Part of the funds to be provided by the project authorities for compulsory afforestation could be deployed in the Himalayan region, even if such projects are being established in the states outside the Himalayan region.

RECOMMENDATION - 9

Management of Forests

In some of the states green felling has been prohibited. The Group suggests that green felling should be uniformly and totally prohibited in all the states of the Himalayan region. However, the requirements of the local people of fuel wood to be drawn from lopings, branches and fodder should be met and the existing rights of the local communities safeguarded. Commercial-scale exploitation of the forests should be comprehensively banned.

Forest management as traditionally practised in the area needs to be reviewed. The Group accepts the need for species diversity in the forest area. However, to create employment opportunities and improving the economic well-being, the present policy of afforestation in degraded areas needs to be reviewed. In a multiple tree cropping, as part of the social forestry programme, inclusion of some types of horticultural crops especially the nut bearing trees may con-

tribute both to bringing degraded areas under vegetative cover as well as creation of employment opportunities, increased income flow to the local communities.

The country can gain a great deal from the experiences gained in forestry management in several other countries. A systematic attempt at collection of world experience and selection of management principles of relevance to Himalayan region, needs to be undertaken.

RECOMMENDATION - 10

Agriculture and Allied Activities

Agricultural development in the Himalayan region is characterised by extremely small land holdings and very low land: man ratio. Due to migration of the menfolk from the region seeking employment in the plains and outside of region, in several areas, agriculture is predominantly in the hands of women. The issue in agricultural development process is critical. Efforts that agriculture technology reaches the women folk and the financial credit to women need special focussing.

Given the topography of the area, the rainfall, particularly in the mid hills and higher reaches, agriculture development, defined in a comprehensive way, may have to be quite distinct. Raising of the seasonal crops without proper terracing, an expensive proposition in any event, makes agriculture operations prone to large scale top soil erosion and unregulated surface run-off leading to degradation of land. Agriculture development may essentially centre round raising perennial vegetation in the form of horticultural crops, fuel and fodder trees, pastures to support animal husbandry programmes etc.

Further agro-forestry and sericulture could also be promoted both from the points of view of increasing the income through high value generating enterprises as well as maintenance/upgradation of ecological balance.

A systematic attempt at the development of perennials should be fully backed up with research in terms of tree cropping systems, species to be grown and should be worked out. A master plan for the development of horticulture, sericulture and other tree based farming system, should be prepared in a time bound manner.

It would also be necessary for the concerned State Governments to be associated with the Union administrative Ministries dealing with the subjects to establish all backward linkages in the form of nurseries to raise sufficient planting material to give operational context to the master plan.

RECOMMENDATION - 11

Packing and Marketing of Horticulture Products

Another critical need is to establish adequate and effective marketing arrangements, particularly when the agricultural commodities produced are perishable in nature such as apples, peaches, strawberries, plums, leachies etc.

The Group would recommend that even in the choice of horticulture programmes it may be worthwhile to pay attention to low volume high value crops which are not highly perishable such as the various types of nuts. Marketing of horticulture products to ensure remunerative returns to the growers will largely influence the success of the horticulture programmes.

Growers organisations should be actively encouraged by the States to collect fruits, vegetables to bring these to central points and thereafter market in different parts of the country.

Often the requirement of packing materials has had unhealthy influence on the maintenance of tree cover in the region due to the over-emphasis on using wooden crates. The National Committee on the use of plastics in Agriculture and under its programmes there are several agencies which have designed polymer-based packing materials which could be re-cycled. Specific programmes need to be launched for weaning away the producers, traders etc. from using the wooden crates and promoting the use of plastic materials to reduce the dependence on wood.

An attempt had been made to establish processing units to process fruits, particularly culls and those not fit for table purposes. The Group understands that some of these processing units are languishing. A detailed analysis and review of the functioning of the processing units must be undertaken and corrective measures taken. Establishments for ensuring value addition, higher returns to producers which will also create employment opportunities in these regions are recommended.

RECOMMENDATION - 12

Marketing of Horticultural Products to Neighbouring Countries

Another aspect of marketing of agricultural products in the Himalayan region is that the products were being earlier marketed traditionally to China or to Bangladesh. The Group recognises that the Government of India had initiated measures through the Ministry of External Affairs to improve border trade. This aspect is critical for the marketing of agricultural products and needs to be substantially stepped up. This could greatly assist in the producers getting marketing outlets for their products and probably getting a better price.

RECOMMENDATION - 13

Jhuming Cultivation

The slash and burn system of agriculture operations called jhuming is widely prevalent in many of the States of North Eastern Region. Increase of population pressure has reduced the slash and burn cycle from 20-30 years to 5 years or even less. The impact of this on the forest cover, soil erosion has been extensive. Agriculture practices need to be substantially stepped up

through minimal terracing arrangement and by the provision of appropriate implements and machinery, minimal irrigation facilities to enable farmers to improve productivity in properly cultivated settled plots. The existing jhumming cultivation has disastrous impact especially in steep slopes. Promotion of horticulture, agro-forestry, and sericulture may be intensively carried out under appropriate schemes for the rehabilitation of cultivators practising jhumming.

Success of the programme will be contingent on meeting the requirements of foodgrains and other essentials to the population in the region. The Group cannot over-emphasise on an effective public distribution system to reach the basic essentials to the population if a dent on the jhumming is to be made.

RECOMMENDATION - 14

Irrigation

Provision of irrigation in the hilly terrain is not simple. Presently a system of diversion of water for irrigation of crops in the slopes is being resorted to. Technologies for irrigation practices should be systematically studied and extended under appropriate programmes to the farmers. Installation of improved irrigation devices such as sprinklers and drip irrigation in these regions, especially for the orchards, should be actively promoted.

RECOMMENDATION - 15

Energy

The Himalayan region is rich in resources for production of commercial energy, especially the hydel power. The basic conundrum has, however, been that except in one or two states, the extension of electrification in the region has been tardy. If the benefits of generation of hydel power do not reach the local inhabitants, this is bound to create difficulties in the exploitation of the available natural resources. The Group recommends that in all programmes for tapping of energy sources, meeting the requirements of the people living in the area should merit the highest priority even if the cost of the extension of electricity grid is likely to be relatively more expensive than in the plains. The energy needs of those living in the Himalayas arise for cooking, lighting and warming. A larger network of electricity distribution would reduce the dependence on firewood and hence will protect the forestry resources.

The Himalayan region is rich with sites for generation of micro-hydel power, based on perennial streams. Recently emphasis has been laid on tapping of the micro-hydel generation potential. To the extent that the local community is involved in the operation and maintenance of the micro-hydel generation units through proper build up of skills and distribution is completely entrusted to the local people, this could facilitate realisation of the potential.

In the region, sparsely populated villages in remote areas are a common feature. Non-conventional sources of energy, such as photo-voltaic cells, use of

organic materials for gassification (biogas) and wind turbines can enable meeting the needs of lighting and pumping devices in such villages. The Group recommends that a systematic study of the demand and measures for the supply of energy needs should be attempted and concrete programmes drawn up to be implemented in a time bound manner. For this, a proper mix of the supply through both conventional and non-conventional sources of energy should be attempted.

RECOMMENDATION - 16

Non-Farm Economic Activities

Given the fragility of the Himalayan ecosystem, a large scale industrialisation following the pattern in the plains would be totally unsound environmentally. Some attempts have been made to develop service engineering, especially in terms of extension of the use of electronics in the Hill regions. The choice of industry including the services, which could be extended in the region would need to be carefully worked out.

Apart from the agro-based industries which are highly recommended, it is necessary to explore other industries based upon usufructs of forests which could be established in the region. This can augment the economic activities, and should generate higher incomes and provide employment opportunities. Mushroom cultivation and bee-keeping have proved to be most remunerative activities leading to prosperity and must be encouraged to develop their full potential.

RECOMMENDATION - 17

Health, Nutrition and Family Welfare

The Himalayan States have major health problems as prevalent in other parts of the country as also some which are more intensively seen in the Region such as Goitre, Malaria, Respiratory Disorders, STD, AIDS etc. Generally, the contributory factors are under-nutrition, special geo-physical, geo-climatic, socio-economic and other variables present in the Region.

The Group, therefore, recommends that the Ministry of Health & Family Welfare should provide more funds on priority basis for strengthening of National Malaria Eradication Programme, National Tuberculosis Control Programme, Child Survival and Safe Motherhood programme, National Iodine Deficiency Disorder Control Programme and National AIDS Control Programme in these areas.

The Group also recommends that the access to health services should be significantly improved in the area particularly in relation to establishment of the Sub-Centres and Primary Health Centres so that adequate infrastructural facilities are available for delivery of Health and Family Welfare Services. The backlog of establishment of Sub-Centres, particularly in the tribal and difficult areas should be removed as early as possible.

The Sub-Centres, Primary Health Centres, Community Health Centres and other health institutions should be fully operationalized by providing physical facilities including buildings and residential quarters, filling up of all vacant posts and ensuring supply of essential drugs, dressings and other consumables. Resources of Rural Development schemes like JRY, special area projects and adoption of cheaper technology for building construction should be used for removing the backlog in physical facilities. Because of the acute shortage of medical facilities in these areas the use of indigenous systems of medicines should be promoted and integrated in general health services.

Pilot studies should be undertaken in a few districts in each Himalayan State to generate district level data base for assessing the prevalence and causes of morbidity and mortality in the Region. National level institutions viz. ICMR, NIHFW, selected Medical Colleges (including colleges of Indian System of Medicine) may be entrusted the above responsibility.

RECOMMENDATION - 18

Preparedness for living in Earthquake - prone areas

Some regions of the Himalayas are very vulnerable to earthquakes as they form a part of the Alpine seismic belt. More than a dozen earthquakes, equal to or exceeding the magnitude 7.5 have occurred in these areas during the last 100 years including the Uttarkashi Earthquake of October 20, 1991. Since it is difficult to make accurate predictions of the earthquakes, the Group recommends the following measures:

- 1) Adoption of a building code for earthquake-prone zones. There are inexpensive methods adopted by Japan and other countries which should be strictly followed while designing the buildings and houses in the seismic zone. The Central Building Research Institute, Roorkee has developed some inexpensive designs.
- 2) Standards for earthquake resistant structures should be developed for the Indian conditions.
- 3) To reduce future danger in the event of earthquakes, the very pattern of living of the people must be modified and adapted in a suitable manner. Precautions like not keeping heavy objects above the head-level, not leaving heavy objects loose on the ground, keeping first-aid kit and emergency supplies of food ready at all times should be followed. There are many guidelines for preparedness. It is very desirable to discuss these amongst the family and community so that some organised efforts could be made at a time of any eventuality. People are just not aware of them.

RECOMMENDATION - 19

Roads and Communication

Improving the access to the inhabitants of the region, on one hand, and the adverse effect of the construction of large network of roads do produce a dilemma. Adverse effects of the construction of roads, without safeguards, have posed serious problems of land slides. This not only affects the movement of men and material, leading to heavy siltation, but also destroys agricultural lands and forests. Special studies ought to be conducted on the construction methodology of roads in the hills as would minimise the adverse effects and all safeguards, even if these increase the costs, should be taken so that the construction of roads is not environmentally damaging and will not lead to ecological disturbances, land degradation and soil erosion, disruption in drainage pattern, loss of forestry, vegetation and aesthetic degradation. The Group recommends that the Central Road Research Institute of the Council of Scientific and Industrial Research (CSIR) must be consulted for the design and construction of roads under specialised conditions such as the Himalayan Region.

It is also necessary that the road network should be so planned that no attempt is made to reach each and every habitation. Alternative construction of bridle paths, trollies, ropeways to move materials from hamlets and orchards to central collection points on the main roads, would need to be explored. All villages or groups of villages with a population of 500 or above should be connected with all-weather roads.

RECOMMENDATION - 20

Tourism

One of the major activities in the Himalayas is tourism both in the form of pilgrim tourism and for pleasure and adventure. While infrastructural facilities would need to be created to enable tourism to develop fully in the Himalayan region and become a major economic activity, it is necessary that the impact of the creation of luxury hotels, eating places at the cost of local ecology must be studied in depth.

Home/cottage tourism, especially for the pilgrim and middle class tourists, would need to be promoted actively. Liberal credit should be available to the local inhabitants to construct paying guest accommodation. This will provide both income and employment to the local population, while simultaneously creating infrastructure for the middle-class tourist coming from outside.

RECOMMENDATION - 21

Development of Tribal Population

Most of the tribal population lives in isolated rural areas. They are directly or indirectly dependent on agriculture and agro-related activities. Food security

is an important component not only for their survival but also for their well-being. Other element of their overall development is related to employment or their right to work. The Group, therefore, feels that highest priority should be given to agriculture and other food-generating activities. Literacy, primary education, health, shelter and protection of their children should also form components of developmental plan. Promotion of the role and status of women in the tribal society must receive major consideration to make human development holistic. The ultimate objective of our planning should be that all basic needs should become within the reach of the tribal population of the Himalayan region. The concerned state governments must develop action plans to bring in prosperity to the tribals.

RECOMMENDATION - 22

Institutional Arrangements in States

In the states, which fall entirely in the Himalayan region, one could expect that in every aspect of its administration, the special features of the Himalayan region, particularly the fragile ecological system, would be kept uppermost in mind. In Uttar Pradesh, a separate Hill Development Department has been created to address itself to the principal issues peculiar to the region. In the case of West Bengal, a separate Darjeeling Gorkha Hill Council has been established. The District Councils in the North-Eastern region play an extremely important role in guiding the affairs of the local areas. Nevertheless, the Group feels that in many ways the administrative pattern seems to be more or less parallel and on the model, carried out elsewhere. The Group cannot over-emphasise the fact that in every aspect of the administration of the affairs of the people living in the hills, special considerations which require to be bestowed on various aspects of socio-economic development must be integrally incorporated. Preservation of environment and maintenance of ecological balance must merit maximum attention.

RECOMMENDATION - 23

Involvement of NGOs, Voluntary Organisation etc.

In several regions of the Himalayan States, the local people have adopted technologies as have enabled them to meet their needs without serious adverse implications on environmental preservation and ensuring the local ecology does not get impaired. The Group suggests that in the process of generation of technologies for development, adequate attention needs to be paid for integrating indigenous technologies which have stood the test of time and this must be consciously looked at and promoted.

There is an increasing recognition that sound socio-economic development would only be possible through active peoples' involvement and participation in

the formulation and implementation of plans, especially in terms of harmonising the environmental concerns and economic growth. The Group recommends that a fuller understanding of the felt-needs of the local people, their wisdom can be expected to contribute towards this. Several NGOs have been actively involved in the upliftment of the local communities and have been able to articulate the perceptions of the local community. The developmental programmes must associate NGOs which could improve their efficacy. The Group also feels that the association of the International Centre for Integrated Development of Mountains (ICIMOD) would be extremely beneficial for further guidelines and advice in the removal of poverty.

RECOMMENDATION - 24

Source of Funding

Projects, schemes, new studies or investigations emerging from the recommendations noted above will require financial inputs. For this very reason the creation of a National Himalayan Environmental and Development Fund (NHEDF) has been suggested. This Fund, initially would not be large enough to cover all what might be needed, but depending upon the success in the implementation and the response that this report receives, the quantum of allocation could be enlarged suitably.

The Group has not suggested the establishment of any new institutions or research centres but has stressed upon the need for creating linkages and cooperation between the existing institutions, agencies, voluntary organisations and the States dealing with the Himalayan Region. It has identified one institute as a nodal point and has suggested the creation of a platform for holding annual meetings and the formation of an Association in which all the existing institutions and agencies would be clubbed to work together to bring in prosperity and sustainable development in the Himalayas. All legitimate expenditure in implementing such a programme should be met by the NHEDF.

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ANNEXURE-I

No. Q-12074/1E/01/92-E&F
Government of India
Planning Commission
(E&F Unit)

Yojana Bhavan,
Sansad Marg,
New Delhi-110 001
27th March, 1992

ORDER

Planning Commission have decided to constitute an Expert Group to formulate a National Policy on the Himalayas for Integrated Development. The composition and terms of reference of the Expert Group are as follows:-

Composition:

- | | |
|--|----------|
| 1. Dr. S.Z. Qasim
Member (Environment and
Science & Technology)
Planning Commission | Chairman |
| 2. Dr. Jayant Patil
Member (Agriculture),
Planning Commission | Member |
| 3. Prof. J.S. Bajaj,
Member (Health),
Planning Commission | Member |
| 4. Prof. K.S. Valdia
Professor and Head
Department of Geology,
Kumaon University, Nanital | Member |
| 3. Dr. Harsh Gupta
Adviser
Deptt. of Science & Technology
New Delhi | Member |
| 6. Dr. P.S. Ramakrishnan
Professor
Deptt. of Environmental Science
Jawaharlal Nehru University
New Delhi | Member |

- | | | |
|-----|--|------------------|
| 7. | Dr. D.N. Tiwari
Director General
I.C.F.R.E., Dehradun | Member |
| 8. | Dr. Virendra Kumar
Zakir Hussain College
New Delhi | Member |
| 9. | Shri D.K. Biswas
Adviser
Ministry of Environment & Forests
New Delhi | Member |
| 10. | Dr. I.K. Barthakur
Principal Adviser
Planning Commission | Member |
| 11. | Dr. A.N. Purohit
Director
GB Pant Institute for Himalayan
Environment and Development | Member |
| 12. | Dr. R.S. Mann
Professor
Deptt. of Anthropology
University of Delhi | Member |
| 13. | Special Secretary,
Planning Commission,
Government of India,
New Delhi. | Member |
| 14. | Shri K. Rajan,
Adviser (Agri, E&F),
Planning Commission,
Government of India,
New Delhi. | Member |
| 15. | Shri R.C. Jhamtani
Joint Adviser
(Environment & Forests)
Planning Commission | Member-Secretary |

Terms of Reference:

- 1) To make recommendations towards development of a national policy on the Himalayas for an integrated mountain development with a view to ensuring that the entire region is used to the best advantage of our country.
- 2) To make an assessment of scientific, environmental and material resources of the Himalayan region.

- 3) To identify specific areas of activity which fit into the ecology of the Himalayan region and are consistent with the socio-economic character of the region.
- 4) To estimate the carrying capacity of environmentally sensitive areas within the Himalayan region.
- 5) To suggest suitable organisational mechanism to implement the proposed policy.

Non-official Members of this Group would be entitled to TA/DA as per Government norms.

The report of the Expert Group would be submitted within three months.

(N.K. MALHOTRA)
Deputy Secretary to the Govt. of India

To

All Members

ANNEXURE-II

SUMMARY OF THE ACTION PLAN

PREPARED BY G.B. PANT INSTITUTE OF HIMALAYAN ENVIRONMENT & DEVELOPMENT

The fragile ecosystem of the Himalayas has complex problems such as population pressure, deforestation, landslides, erosion, water scarcity, out migration and poverty. The collective impact of all these, coupled with the geological instability of the region, manifest themselves into what is called "degradation of the Himalayan Environment". The various types of developmental activities presently going on are directly or indirectly concerned with the welfare of human beings. However, the process of development has been uneven because of various reasons. The average size of holding of land in the Himalayas is smaller than what is found elsewhere in the country. This is because a large chunk of land in the mountains is either used for non-agricultural purposes, e.g., forests or is not suitable for agriculture. The region, however, as a whole, has a potential for producing many high value products as an alternative to traditional agriculture.

It should be noted that population growth alone has not led to the extent of deforestation which has occurred there. It is largely because of mismanagement of forest resources and that is what we have to rectify in our future planning for development in the Himalayan region.

Development is a continuous process, even the most developed countries strive to develop further. Policy framers, programme executors and the scientific community are now concerned more for the sustainability component in the development and perhaps less for the pace of development.

The appreciation for the environmental values blended with the judicious use of the natural resources should form an integral component of Himalayan development. Technological know-how for many problems is available but it is not getting transferred to the users as fast as it should have been. One of the dilemmas being faced today is because the administrators (managerial staff) and the scientists (academic staff) are working differently.

Application of Science and Technology for the restoration of the degraded environments, coupled with economic upliftment of the Himalayan people, can only be achieved using parallel efforts on strengthening the base of Science and Technology.

Himalayan rivers are considered to be the most important for the economic prosperity and environmental salvation not only of the hill areas but of the whole country. The limitation in the technology for designing suitable intake structures, water harvesting and supply systems in the hill regions must be solved by innovations of Science and Technology. Water resource as a natural asset of

the region should be harnessed for national needs after meeting the local needs instead of maintaining a competition between the two.

Amongst a variety of resources in the Himalaya, forests have received perhaps the maximum attention but this has been done more as a subject of administration than of management in a true sense. Forests, no matter what restrictions are framed for their accessibility and use these will continue to be treated by the local people as a 'free natural resource' as long as suitable alternatives are not provided to them to meet their basic needs.

Governmental efforts should be strengthened to take up the task of land consolidation on a priority basis. Immediate intervention on the part of the government as well as that of the people is necessary so that legal provisions of private ownership do not restrict the land use for the benefit of the people. Traditional systems should not be disrupted unless government interventions are found superior to the indigenous technologies based upon their rigorous performance evaluation in the mountain areas.

An institution like the 'public purchase system' or cooperative marketing would be very useful for promoting trade in inaccessible areas of high hills.

A long-term plan for horticultural development should be prepared, incorporating a crop diversification programme and indicating what crops should ideally be grown and where in the future and at what scale.

Road alignments should be worked out on the basis of geotechnical feasibility instead of the desire of the people, which is more often put forward and emphasized to serve political motives. It is most surprising that the matter of constructing ropeways or cable transport has not been given the attention it deserves.

Tourism be declared an industry throughout the Himalayan region so that various benefits of establishing an industry in the industrially backward area can be reaped by those who may like to invest in this venture. For economic benefits, alternatives are available in the form of setting up of small scale industries in large number. The Science and Technology know-how is fully known for establishing such units and it is now simply a matter of transfer of technology on a priority basis to the hill regions. There are several 'wild fruits' traditionally used to supplement diets but remain unexploited for their economic values. Technology for the extraction of their active components and preservation should be developed.

Decentralized schemes of water storage and supply, targetting small areas and managing the flow of water, and not against the gravitational force should be emphasized. If adequate and safe drinking water and disposal of wastes could be provided to all the hilly areas, most health problems will disappear automatically.

ANNEXURE -III

STRATEGIES FOR HIMALAYAN DEVELOPMENT AS REFLECTED IN PREVIOUS PLANS

Hill Areas from First to Fourth Five Year Plans

Since the setting up of the Planning Commission in March 1950 with its mandate to make an assessment of the material, capital and human resources of the country leading to the formulation of Five Year Plans, the utilisation of the resources of the country and the determination of priorities for the allocation of these resources became a regular feature. There was very little which could be construed at that time, as making special efforts towards the development of hilly regions of the country. However, it was sought to make such interim recommendations as were necessary, based on the considerations of the prevailing economic conditions and after taking into account the specific problems indicated by the Central or State Governments.

From the First Five Year Plan (April 1951 to March 1956) upto the Fourth Five Year Plan (1969 to 1974), wherein the planning was described as a vital instrument for realising the social objectives enshrined in the constitution, there was very little mention, specifically of the Himalayan regional development. However, in the Fourth Plan, the need for the development of the special and backward areas was taken into consideration and an allocation of Rs. 43.55 crores was made for this purpose.

Hill Areas in Fifth Five Year Plan

This scheme referred to the hill regions of Assam, Tamil Nadu, U.P., West Bengal and the Western Ghats regions. Programmes of significance were funded partly from the State Plan and partly from the sub-plan allocations. During the first three years of the plan, the Central allocations were of the order of Rs. 76 crores, while the States were likely to invest about Rs. 68 crores.

Thus, with the experience gained till that time, the programme was expected to gather momentum.

Hill Areas in Sixth Five Year Plan

The hill areas fall broadly into two categories, namely, (i) those that are co-extensive with the boundaries of the State or the Union Territory and (ii) those which totally form a part of a State. The development of both categories of the hill areas requires appropriate programmes of development which were given the following classifications and approaches:

(a) Hill States

The hill areas, which are self-contained as politico-administrative units, are being treated as Special Category States whose outlays are met substantially out of the Central assistance. These are the States and Union Territories of the North-Eastern Region, Jammu & Kashmir and Himachal Pradesh. The investments needed for meeting the vast infrastructural gaps in communications, transport and power generation and transmission, for the development of stable and diversified agriculture replacing the extensive practise of jhuming, for horticulture, plantation crops giving raise to low volume and high-value products and for protecting the ecology, are heavy. On the other hand, it would take a considerable time for these areas to build up an adequate resource base. In view of this, the bulk of the outlays are provided out of the Central assistance.

(b) North-Eastern Council

For the integrated development of the Hill States and Union Territories of the North-Eastern Region, the Central Government has set up the North-Eastern Council in 1971 by an Act of Parliament. The North-Eastern Council started functioning with the commencement of the Fifth Five Year Plan. The Council takes up such schemes which are of common interest to more than one state or Union Territory. It normally treats the region as a whole under its development of inter-regional programmes of power generation and transmission, construction of roads, agriculture, animal husbandry, fisheries etc. It has been supporting research and 'developmental' projects. A training infrastructure is being built up for manpower developemnt in the region under the auspices of the Council.

(c) Hill Areas in Composite States of the Himalayan and Sub Himalayan Region

The hill areas forming parts of a larger composite State occur in Assam, Uttar Pradesh and West Bengal in the Himalayan and sub-Himalayan regions. Although the primary responsibility for the development of these hill areas is that of the concerned State Government, the need for Central assistance has been recognised even as far back as the Second Five Year Plan. Arrangements for providing Central assistance to the Hill Areas Development Programme have been further systematised since the commencement of the Fifth Five Year Plan. The Special Central Assistance is being allocated among the constituent States, giving equal weightage to the area and population of the hill regions.

Since the Fifth Plan, the concept of a sub-plan has been introduced in order to ensure complementarity and linkages among the schemes formulated under the various State Plans and out of the Central assistance. A statement showing the Area, Population and Districts/Talukas covered under the Hill Areas Programme is given below:

Hill Area	Area (X1000 Sq.km)	Population (1971) (lakhs)	No. of Districts
Assam Hill Areas	15.2	4.55	Two Districts (Karbi Anglong and North Cachar)
Uttar Pradesh Hill Areas	51.1	38.22	Eight Districts (Dehradun, Pauri Garhwal, Tehri Garhwal, Chamoli, Uttarkashi, Almora, Pithoroghar and Nainital)
West-Bengal Hill Areas	2.4	4.80	Three Sub-Divisions of Darjeeling District viz. Sub-Division of Sadar, Kalimpong and Kurseong.

Hill Areas Development in Seventh Plan

The hill areas of the country, particularly the Himalayan and the Western Ghats regions, which constitute about 21% of the total area and contain 9% of the total population of the country, support the basic life-giving natural resources but have fragile and sensitive ecosystems. The need to conserve natural resources and the environment, particularly to prevent damage to the fragile and irreplaceable ecosystems, has been voiced in national policies and programmes for quite some time. The hill area development programme (HADP), in operation since the inception of the Fifth Five Year Plan, has been a major step in this regard. Simultaneously, it has also aimed at the goal of balanced regional development. During the Seventh Plan, the programme had entered a crucial phase, particularly with reference to complementarity of interests of the hills and plains.

The hill areas fall broadly into two categories, namely: (i) those that are co-extensive with the boundaries of the State or Union Territories i.e. the Hill State and UTs and (ii) those which form a part or parts of a State, and which are Designated Hill Areas.

Hill States/UTs

The areas falling within this category are self-contained politico-administrative units. These have their own Five-Year plans to take care of their

developmental needs and are the States and UTs of the North-eastern region, Jammu & Kashmir, Sikkim and Himachal Pradesh. All these are being treated as special category states. A review of the plans of the states of this category reveals that the main emphasis has been on the development of infrastructural facilities and social and community services during both the Fifth and the Sixth plan periods. This thrust was necessary to cover the backlog in the infrastructural facilities. The production sectors and the sectors having a direct bearing on ecological preservation and restoration received less attention. These sectors were given their due share in the Seventh plan.

Designated Hill Areas

In the second category, the hill areas so far identified form parts of: (a) the larger States of Assam, Uttar Pradesh, West Bengal and Tamil Nadu, and (b) Western Ghats areas covering 163 talukas in the States of Maharashtra, Karnataka, Kerala and Tamil Nadu and the Union Territory of Goa. Only these designated hill areas are covered under the Hill Area Development Programme (HADP) operative since 1974-75. The area, population and districts/talukas at present covered under the HADP are detailed in the following table.

**Area, Population and Districts/talukas constituting Hill Area
Development Programme HADP**

	Area (X1000 sq.km)	Population (lakhs 1981)	Coverage
(a) Himalayas/Sub-Himalayas:			
Assam Hill Areas	15.2	6.31	Two districts (Karbi Anglong and North Cachar).
Uttar Pradesh Hill Areas	51.1	48.04	Eight districts: (Dehradun, Pauri Garhwal, Tehri Garhwal, Chamoli, Uttarkashi, Almora, Pithoragarh and Nainital).
West Bengal Hill Areas	2.4	5.45	Three sub-divisions of Darjeeling district, viz, Sadar, Kalimpong and Kurseong.
Contd.....			

(b) Western Ghats			Talukas
Maharashtra	58.4	101.2	62
Karnataka	44.3	66.7	40
Tamil Nadu	28.02	95.4	29
Kerala	28.1	123.8	29
Goa	1.7	1.3	3
Total	160.5	388.4	163

The guiding principles on which the hill area development programmes have been based are the promotion of a secure, basic life-support system, and judicious utilisation of land, mineral, water and biotic resources in a total perspective embracing the complementarity of interests of both the hills and the plains. The whole strategy centres around the active participation of the people, particularly of women, in the fulfilment of their basic needs. The people's involvement can be ensured by ingraining the concept of "social fencing", which implies a voluntary and self-imposed discipline in managing the resources at the local level. A better understanding of the resource base and the ecosystems is an essential ingredient of development, planning and management. This necessitates the creation of awareness of vital importance of maintaining the eco-systems. This forms an essential ingredient for development, planning and management. It is increasingly evident that development efforts tend to produce widespread effects (often deleterious) as a result of strong interactive linkage effects between a growing population within a fixed or limited resources and a fragile ecosystem. The plans of the hill states and the hill areas, therefore, should be based on environmental considerations in addition to socio-economic and cultural considerations. In the formulation of policies, plans, programmes and schemes, ecorestoration, ecopreservation and ecodevelopment must be given due consideration. Not only in new projects, programmes and schemes but even in the on-going activities a critical review and the possible harmful, short-term and long-term consequences must be highlighted.

Basic Needs of Hill People

The basic needs of hill communities are kept in the forefront during the formulation of the development programmes. Specific attention is being paid to relieve women and children of the inevitable drudgery of forced labour in the hills. Important basic needs such as energy, fodder, water supply, health and education call for measures like the following:

- (i) Alternative Energy Policy: To reduce the pressure on forests and the drudgery to which the women are subjected to, an alternative fuel policy should be evolved and implemented. It should have two aspects, firstly to provide an alternative source of energy such as electricity, including microhydel, kerosene, coal, cooking gas, at the subsidised rates for household consumption to wean away people from using wood as fuel, and secondly,

the use of devices such as fuel-efficient ovens and the utilisation of sawmill and logging wastes for cooking and heating.

- (ii) Fuel and Fodder: To achieve sustained supplies of fuel and fodder, denuded forest lands should be afforested with tree species which can provide both fuel and fodder. Pasture land development must receive special attention.
- (iii) Drinking Water Supply: In view of the rugged terrain, high altitudes and remoteness, a proper strategy for the drinking water supply should be adopted in the hill areas. The development of gravitational sources of water, hydraulic rams, storage-tanks and microhydel schemes must be given maximum consideration. Provision of safe drinking water is most essential to minimise the incidence of water-borne diseases and therefore all villages must be provided with adequate and safe drinking water facilities during the Plan period.
- (iv) Health: Prophylactic steps in terms of environmental sanitation, protected water-supply and mass protection against TB, Polio etc., and measures against malnutrition particularly vitamins and protein-deficiency and iodine-deficiency are absolutely necessary. Infrastructural facilities and the quality of services rendered by the primary health institutions should be improved. For the welfare of children, it is necessary to strengthen and expand the Integrated Child Development Services (ICDS) scheme in the hill areas. Pre-and post-maternity care for hill women, particularly those residing in remote areas must be provided. Maximum use should be made of indigenous medical skills; apart from their intrinsic value they have the merit of acceptability and accessibility. Research must be systematically undertaken to develop the indigenous skills in their own right and as a supplement of the modern medical system.
- (v) Education: Lack of skilled manpower is a major constraint in the development of hill areas. It is, therefore, necessary to undertake manpower planning and to link education locally with the specific needs of the hill areas. The hill communities must be involved in the management of schools locally so that these become culture centres of the villages. Single-teacher schools are not ideal for these areas; in fact, the criteria for the location of schools must take into consideration the terrain.

People's Involvement

In all the area programmes, particularly for the watershed management, an active involvement of people, of their own local organisations and of the voluntary agencies are most crucial. Women especially have a pivotal role to play, since they are primarily responsible for agriculture, fuel and fodder collection, maintenance of livestock and other economic activity in the hills.

The Planning Process

Conceptually, the planning process visualises three distinct zones of

operation. Firstly, there are the relatively high and inaccessible altitudes and sparsely populated areas where natural geophysical processes are taking place. Here, the non-interference by man in the form of restraint in the construction or installation of hydel or major multi-purpose irrigation dams, hard-topped roads and industrial projects would greatly contribute to ecology preservation. But since our understanding of the ecosystem in these altitudes is limited, a sound database must be established for understanding the hydrology, climate, tectonics, seismology, flora and fauna, and the safe carrying limits of such areas. Major projects whose total effects are unknown must be critically reviewed. Even a small positive step along with non-interference with the environment would make a substantial contribution towards preservation of the high-altitude ecosystems.

Secondly, in the more populated lower altitudes and regions, the concentration of growing population (including the seasonal tourist influx), industrial projects and road-building beyond the safe carrying capacities of the areas, have caused ecological strain and accelerated degradation. The ill-effects of these can be felt not only in the middle mountain ranges and foothills, but also in the plains below. It is here that the imbalances indicating the strong interactive linkage-effects between the populations, resources, environment and development are markedly in evidence. Thus the aggravation of ecological degradation and the adverse impact on the hill environment is clearly visible in these areas. The planning process in these regions must adopt an integrated view of the ecological, economic and sociological aspects.

Thirdly, there are the seemingly unconnected plains below, which depend not only for their socio-economic development but even for their physical co-existence on the nurturing capabilities of the hill systems. Both for the hill States like the Himachal Pradesh, Jammu & Kashmir and Sikkim, and the hill areas like those in U.P., Assam and West Bengal, the interdependence of hills and plains should be clearly recognized to achieve a mutually beneficial outcome.

Land Use

A proper land use pattern keeping the socio-economic and ecological parameters in view have to be worked out. While the self-sufficiency in foodgrains production may be the main objective, stress must be laid on the scientific land-use and spatial specialisation aiming at suitable crops with appropriate technology for raising their productivity and distribution. Changes in the land-use, particularly from annual crops to perennial crops, would necessitate extending and strengthening the scope to the communication facilities, marketing network and a strong public distribution system.

Shifting Cultivation

An appropriate solution to the problem of shifting cultivation, particularly in the north-east and some areas of the Western Ghats, has yet to be found. Even though special programmes under the Central and State Plans have been launched, many of them have been unable to reach beyond the pilot phase.

The plans in this context should be on watershed basis in which the sectoral programme and social services etc., are integrated and coordinated in such a way that the Jhumias are able to take to settled cultivation. In the areas where introduction of settled cultivation will take a long time, emphasis should be laid on improving the productivity of jhum cultivation through better agronomic practices and improved varieties.

Afforestation

Strenuous efforts are required towards restoration of the degraded vegetation and forest cover constituting the life-support system. Forestry programmes must aim at fulfilling the national requirements of forest produce, maintaining the ecological balance and meeting the socio-psyco-economic needs of the village communities. Revenue-earning should no longer be a major goal. Identification of ecologically sensitive and vulnerable areas must be taken up and comprehensive plans for their right treatment should be implemented. New techniques must be adopted in afforestation, aiming at the reduction in per hectare cost and generating the employment potential. To conserve forest resources, the use of substitutes for forest-based industrial raw-materials should be encouraged.

Hill Areas in Eighth Five Year Plan

A. Problems of Hill Areas

The crucial environment problems of the hills are deforestation and soil erosion, both leading to the drying up of water sources, flash floods and decline in the yield of food and cash crops, fodder, fuel and other minor forest produce. Poverty in the hills is directly related to shortages of materials for basic subsistence, specially where, under the traditional land and water management systems, the capacity of land to support the population has already been exceeded.

In many hill areas, intensive human and livestock pressures along with indiscriminate felling of trees for commercial purposes have already led to loss of soil and rapid depletion and destruction of the forest cover. Besides, to this, the water retention capacity and productivity of land have been adversely affected. These factors have impaired the ecology significantly and have also resulted in the deterioration of the economic conditions of the hill people. Traditional agricultural practices, especially shifting cultivation, have also contributed to the destruction of forests and soil erosion. Seemingly harmless activity, as prolonged grazing by livestock, especially goats and sheep, have further exposed many hill areas to serious ecological degradation. Development activities like the construction of buildings, roads, dams, large and medium industries and mining etc., have aggravated the environmental problems. Consequently, perennial sources of water springs and small streams have dried up in many areas. The major challenge, therefore, is to devise suitable location-specific solutions, so as to reverse the process and ensure sustainable development of the growing population and ecology of the hill areas.

B. Classification of Hill Areas

The responsibility for balanced social and economic development of the hill areas rests primarily with the concerned State Governments.

The hill areas covered under the HADP were the areas identified in 1965 by a Committee of the National Development Council (NDC) and those recommended by the High Level Committee for the Western Ghats in 1972. The HADP would continue to be implemented during the Eighth Plan, only in those areas where it is already under operation.

The hill areas of the country fall broadly into the following two categories:

- (i) Areas which are co-extensive with the boundaries of the State or Union Territory, i.e., Hill States/Union Territories, namely, Jammu & Kashmir, Himachal Pradesh, Sikkim, Manipur, Meghalaya, Nagaland, Tripura, Arunachal Pradesh and Mizoram.
- (ii) Areas forming part of a State, which are termed as "Designated Hill Areas" namely:
 - a) Two hill districts of Assam - North Cachar and Karbi Anglong.
 - b) Eight districts of Uttar Pradesh - Dehradun, Pauri Garhwal, Tehri Garhwal, Chamoli, Uttarakashi, Nainital, Almora and Pithoragarh.
 - c) Major part of Darjeeling District of West Bengal.
 - d) Nilgiris District of Tamil Nadu.
 - e) 163 talukas of the Western Ghats area comprising parts of Maharashtra (62 talukas), Karnataka (40 talukas), Tamil Nadu (29 talukas), Kerala (29 talukas) and Goa (3 talukas).

The area and population of the Hill States and the Designated Hill Areas are detailed in a table included in this Annexure earlier.

C. Pattern of Funding

The Hill States mentioned above are called 'Special Category States'. The amount required for giving Central assistance for their development plans is pre-empted from the divisible pool before making allocations from it to the other States categorised as 'Non-Special Category States'.

The Special Central Assistance (SCA) provided for the HADP is additive to normal State Plan funds. This SCA is not meant to be utilised for normal State Plan activities. The schemes under the HADP, therefore, are to be properly dovetailed and integrated with the State Plan schemes. The schemes undertaken under both these programmes must be conceived and designed to achieve the specific objectives of the programmes and these need not be merely the conventional State Plan schemes.

D. Hill Areas Development Programme (HADP)

This programme has been in operation since the inception of the Fifth Five Year Plan in the Designated Hill Areas.

The basic objective of the Hill Areas Development Programme has been the socio-economic development of the hills and of the people living there. They should make progress in harmony with the ecological development of the area. The programmes implemented under the HADP have, therefore, aimed at promoting the basic life support systems with sustainable use of the natural resources of the area covered by the programme.

The approach and the strategy of the HADP has evolved with the passage of time. The programmes implemented during the Fifth Plan period were mainly beneficiary oriented. While the emphasis shifted to eco-development in the Sixth Plan, the general pattern of the HADP remained substantially the same as that of the normal State Plan following the same sectoral approach. The Seventh Plan laid particular emphasis on the development of ecology and environment, as summed up in three phrases, namely, eco-restoration, eco-preservation and eco-development. It aimed at evolving plans and programmes to take care of the socio-economic growth, development of infrastructure and the promotion of ecology of the areas covered by the HADP.

During the last three Five Year Plans, substantial effort and resources were channelised for the development of infrastructure. However, the corresponding growth in the productive sectors of most of the hill economies has not kept pace with the extent of efforts and resources channelised. During the Eighth Plan, attention was paid towards modernising the agricultural practices and for the promotion of small scale industries at the household, cottage and village levels. To achieve this, the involvement of the people, would be of paramount importance for the improved management of their land and water resources.

The following has been the approach and strategy in respect of the hill areas development planning:

- i) Intensive efforts at the implementation level to arrest the process of degradation of the hills and to improve the productivity of land.
- ii) Innovative approaches to family planning and welfare to contain the population growth at sustainable levels.
- iii) Financial and physical monitoring of the HADP by the State Governments to improve the implementation of various programmes.
- iv) Afforestation programme to be popularised through the village Panchayats and village authorities, schools and other local organisations, groups and clubs. Private nurseries, especially, of multi-purpose trees which yield benefits like fodder leaves, edible fruits, or flowers or seeds, of commercial value.

- v) Application of scientific inputs to agriculture and allied sectors, including identification of crops suitable for the agro-climatic zones, multi-purpose species of trees and bushes to meet the requirements of the people from a well-developed small land area of special importance. This approach is expected to spar considerable areas for permanent greening programmes, like social forestry or horticulture and will serve the long-term objectives of enhancing the production on a sustainable basis.
- vi) Appropriate technologies to bring about localised self-sufficiency and generate alternative means of livelihood, as opposed to heavy dependence on forests, and livestock rearing.
- vii) Use of appropriate technologies to upgrade the traditional productive systems like the agricultural operations, livestock rearing, arts and crafts, household and cottage industries etc., and to reduce the drudgery of women in fetching water, fuel-wood, fodder and other demanding daily domestic chores. These must be encouraged on a priority basis. The technologies have to be need-based, more productive, efficient, low-cost, and ecologically sustainable.
- viii) Extension services should enlighten and educate the people on how to enhance productivity of both cultivated and community land on a sustainable basis in the context of the increased human and livestock pressures.
- ix) Consolidation of small and scattered land holdings in improving the water and land management leading to the productivity of the limited land assets of the people of the hills.
- x) In many hill areas, land assets are held as common or community property. In such areas, people do not make permanent investments and several other problems also originate from this. To overcome these, the local communities must evolve suitable models of land management which would invite permanent investment and ensure both optimal returns, ecological safety and development.
- xi) The State Governments may take a fresh look at their Plan and non-Plan Schemes, forest policies, the land tenure systems, land water use policies and realign them to eradicate practices destructive to ecology and environment.
- xii) To reduce pressure on land, quality of livestock, including goats, sheep, pigs and poultry birds has to be improved and their numbers reduced. There is an urgent need for relating the livestock population to the carrying capacity of the available land. The livestock and cattle improvement programmes need to be integrated with the fodder and cattle-feed development, stall feeding and scientific grazing. The land and livestock management systems must improve rapidly.
- xlii) The productivity of pastures and grazing areas must be restored and enhanced. The effort should be to meet the requirements of food, fuel-wood,

timber and fodder through scientific utilisation of the scarce hill resources on a sustainable basis from the smallest land areas.

- xiv) Development of watersheds that can meet the water requirement of the people and conserve the water and soil resources of the area must be taken up for integrated development. For this, a multi-disciplinary approach is considered most appropriate for creating the conditions conducive to development of natural and human resources.
- xvi) Food security has to be ensured on top-most priority. Development of horticulture, sericulture and plantation, especially the cash crops having low volume, light weight, high value and long shelf-life will provide employment opportunities to people and will generate higher income and ecologically sound development of the hilly areas.
- xvii) Area specific marketing infrastructure, especially for perishable produce and its processing, storage and packaging must be set up where such surpluses are available.
- xviii) At the household level, kitchen gardens should be popularised to supplement and enrich the diet of the hill people.
- xix) Wherever transport linkages have been established and local cultivation of foodgrains is not advantageous, strong Public Distribution System could be extended.
- xx) To reduce the use of wood for packaging of horticultural produce, suitable nonwood based packaging materials such as plastics should be increasingly used on a viable basis.
- xxi) Incentives that would encourage, the formation of large viable hill villages should be encouraged so that the overhead input costs to reach the amenities and services to them, could be reduced.
- xxii) Many hill areas seem to be especially suited to industries that require pollution-free atmosphere, cool climate and precision skills like electronics, watch-making, optical glasses, sericulture, etc. A number of cottage industries like carpet weaving, handlooms, handicrafts and other village and household based small-scale industries can be encouraged. Due to higher transportation costs in these areas, industries which reduce weight and volume, but add value and increase the shelf-life to the locally available raw materials will be advantageous. Large and medium industries should not generally be considered suitable except under very favourable circumstances.
- xxiii) Rubber plantations have proved successful in certain areas. Wherever degraded tree-free land could become available and where rubber plantations could thrive, these should be encouraged.
- xxiv) Development of sericulture has a good potential in the hill areas. A systematic programme of planting feedstock trees for silkworms on all spare patches

of land can be taken up. Development of sericulture can provide employment to educated and skilled workers and generate value-adding activities and bring in foreign exchange. However, the programme will call for right type of technology, prompt payment in cash for the cocoons and primary processing activities at the local levels.

- (xxv) Tourism can be organised as an industry, with due care taken to avoid exploitative use of scarce local resources, especially water and fuel-wood.
- xxvi) Location specific suitable code of conduct for tourists may be evolved so as to maintain the surroundings clean and disease-free, protect local ecology and respect the local traditions, culture and heritage.
- xxvii) Special care should be taken to ensure that hill roads are constructed as per the traffic needs, scientific design and specifications suited to the hill areas, so that the loose soil is contained, proper drainage system is developed and chances of land slides are minimised. In such hill areas, where the population density is low and the villages are small and scattered over long distances, porter or pony tracks can be built and properly maintained. Road and path construction should be completed in all respects without delays to provide access to the localities.
- xxviii) Mining can be carried out but with adequate safeguards of ecology during and after the mining operations.
- xxix) Resource should not be thinly spread on a large number of projects and schemes. The priority for such ongoing and spillover schemes, projects and programmes which do not benefit people in improving their quality of life or are destructive to ecology, can be drastically cut down or terminated.
- xxx) Shifting cultivation, called 'jhum' is mainly practised in nine States of the country, ie., seven States of the North Eastern Region, Andhra Pradesh and Orissa. The continuation of 'jhum' cultivation reflects the inadequate attention paid to the development of agriculture. Improvement in the agricultural practices, development of land for permanent cultivation, increase in 'jhum' land productivity and lengthening of the 'jhum' cycle, will help in disbanding the destructive practice. In isolated areas, permanent cultivation on scientific lines for localised self-sufficiency in food seems to be a strong viable solution to the problem. Simultaneously, development of location specific alternative income generating occupations must continue.
- xxxi) Media support for the transfer of suitable modern agriculture technology and its extension must be given. A separate special programme at about 1800 or 1900 hours should be telecast and broadcast for the hill people who usually go to sleep early.
- xxxi) Some of the voluntary organisations doing commendable work in the hills can be encouraged, especially, those engaged in improving the ecological system in addition to economic and social conditions of the people.

- xxxiii) People have to be made aware of the far reaching implications of the environmental degradation and their active participation must be sought for the reconstruction of ecology. Environmental aspects should be suitably woven into the curriculum of primary and secondary school classes.
- xxxiv) Regeneration and development of the hill environment cannot be achieved without the willing and active cooperation of the people. It will be forthcoming, only if, the benefits from the improved land, water and forests resources reach directly and equitably to the people themselves.
- xxxv) The hill areas prone to intense tectonic and seismic activities, must be identified; activities like the indiscriminate road and building construction and the creation of artificial large water bodies must be minimised and earthquake-proof construction designs should be popularised.
- xxxvi) Large projects which might endanger the ecological balance and displace a large number of people, should be very carefully considered before the investment decisions are taken. Families whose agricultural land is acquired should be settled with productive assets.
- xxxvii) In many hill areas, men folk have migrated to towns and plains in search of employment opportunities. In such areas, women are managing the land and other economic assets. The approach and policies should keep this in view, especially for lightening their burdens of daily chores like the collection of fuel-wood, water, and attending to the livestock and other domesticated animals and birds. It will be of advantage if some women extension workers are appointed or sent in such villages for guidance.

E. Allocation of Special Central Assistance

In the Seventh Plan, out of the agreed outlay of special central financial assistance for HADP, 86.61% went for the Designated Hill Districts and 13.39% for the Western Ghat Talukas. However, during 1989-90, 1990-91 and 1991-92, additional funds to the tune of Rs.5.00 crores, Rs.1.67 crores, Rs. 3.00 crores respectively were allocated to the Darjeeling area.

The funds in sight for the HADP in the Eighth Plan are Rs. 1450 crores. Out of this, Rs. 4.67 crores per annum are set apart for Darjeeling and the balance amount will be distributed in the ratio of 86.61 : 13.39 between the Designated Hill Districts and the Designated Talukas of the Western Ghats respectively.

As against Rs.870 of the agreed outlay for the Seventh Plan, the allocation on year-to-year basis aggregated to Rs. 1067.80 crores. For the Annual Plans 1990-91, 1991-92 and 1992-93, the allocations were Rs. 287.00 crores, Rs.290.00 crores and Rs. 290.00 crores respectively.

In the light of the existing financial constraints, the outlay for the Eighth Plan will be Rs. 1450 crores. The details of which are follows:

Allocation of Special Central Assistance (SCA) for the Designated Hill Areas during the Seventh and Eighth Five Year Plans.

	Seventh Plan Outlay	Allocation on yearly basis	Eighth Plan Outlay
A. Designated			
Hill Districts of	753.50	924.03	1235.62
Assam	118.20	114.34	194.34
Tamil Nadu	33.75	41.53	55.49
Uttar Pradesh	553.50	679.19	910.04
West Bengal	44.55	55.04	73.25+
Surveys & Studies	3.50	3.93	2.50
B. Designated Talukas of Western Ghats			
Region	116.50	143.77	191.03
T o t a l (A + B):	870.00	1067.80	1426.65

+Excludes Rs.23.35 Crores provided as additional SCA for Darjeeling hill areas of West Bengal.

ANNEXURE-IV

Views of Environmentalists working at the grassroots level on problems of development in the Himalayan region

Summary of the views of Shri Sunderlal Bahuguna

A meeting with Shri Sunderlal Bahuguna was held in the Planning Commission on 24th May 1993 to discuss the constraints being faced in the Himalayas in its development. The meeting was chaired by Dr. S.Z. Qasim, Member, Science, Technology and Environment. Other senior officers representing the various Divisions of the Planning Commission were also present.

Drawing upon his more than half century experience of work in the Himalayas, Shri Sunderlal Bahuguna said that the destruction of the Himalayan ecosystem and the way of life are being concealed under the guise of development. The silent spectators of this are the people of the region who hold the Government responsible for this blunder and destruction. He mentioned that a number of high dams are proposed and are being built in the earthquake-prone Himalayan regions. The most famous of them is the 26 m high Tehri dam. Other dams in the Central Himalayas like Lakhwar (Yamuna), Kishshar (Tons), Vyas and Karnaprayag (Alaknanda), Bhairighati (Bhagirathi), Koteshwar (Ganga) etc. are awaiting funds from the international funding agencies like the World Bank and Asian Development Bank etc. While planning for these big dams, the long-term economic, social cultural and ecological impacts have been totally ignored, as these projects are based on dam building technology of the erstwhile USSR and other countries. The basic point that the Himalayan rivers emerge from various glaciers and the glaciers do break creating artificial lakes and flash floods has been completely ignored by the planners. The frequent landslides, tremors, ground subsidence, hillock tumbling etc. give a sure prescription for dam bursting disaster of a formidable nature in the future.

Shri Bahuguna raised various points regarding the overall hill area development and mentioned about his report which he had prepared to solve the problems of the hills. He said that the genesis of the 'Chipko' movement lies during the First Five Year Plan and the hill women played a crucial role in its shaping. They had revolted against the liquor vending and other social evils and collected fuel wood and fodder from the forests. He summarised the kinds of malaise being faced by the Himalayas and outlined that the local people are facing grave difficulties like: (i) drinking water sources which have disappeared in the hills, (ii) silt from the Himalayas has choked the Ganga and the Yamuna valleys because of which the fertiliser consumption has increased, (iii) large scale cutting of forests has drastically changed the weather phenomenon, etc.

Apart from this, people are forcefully displaced without any chances of their proper rehabilitation. He pointed out that at present more than 13,000 Pong dam

oustees are without rehabilitation. This has resulted in their becoming victims of sugarcane growers who in turn exploit them. The land given to them is poor, meagre and marginal. Without any forests and fodder around them, they can not rear their cattle. This has created a vicious cycle. He criticised the short-sighted ambitions of the Himalayan States for becoming well off by harnessing the hydro-power. This is comparable with what the Gulf countries have done with their oil.

The spread of tourism in the Himalayas for which he cited the example of large scale construction near Badrinath, has also played havoc with the local people. The virgin land slopes are being devastated by vested interests. Luxury tourism treats 'Nature' as a commodity for sale. The idea that money could buy everything is totally a foreign concept for the austerity minded people of the Himalayas. Economic growth should not blind the people in destroying Nature which exists, there, in its most pristine form. The personality of an average Himalayan person is identified with his moral, courage and sacrifice which has no equivalent and can not be purchased by money.

He told the pathetic story of the Doon Valley, where the once highly fertile Basmati Rice fields have been converted into deserts and the water sources have dried up. Finally the Supreme Court has intervened by stopping the mining in the Doon Valley. Similarly, in Himachal Pradesh, forests are being destroyed by two existing cement factories while other cement projects in different regions are under different stages of completion or commissioning. This may turn the Health Improvement Centres of the hills into Respiratory Diseases Centres. Similarly, the West Bengal hills may also face the same fate due to Dolomite mining and plantation crops.

Shri Bahuguna said that the threat to Himalayan ecology from deforestation is immense. Chipko Movement could not bring the desired effects, thanks to the attitudes of the Forest Department by treating the forests as sources of revenue, which largely goes in their own pockets. This commercialisation of timber which exists in the form of Poplar and Pine have destroyed the river valley forests, once acting as watersheds. Once the natural forests have gone, there was no top soil left on the hill slopes. This in turn led to cultivation of steeper hill slopes resulting in accelerated soil erosion and drying up of water sources. In Kashmir, instead of time-tested indigenous tree called 'hatab', Poplar was planted leading to scarcity of fodder and fuel wood, while, on the other hand, it is filling the pockets of Forest Department and private contractors. This has given rise to a new brand of 'Mafia' with a political patronage who are engaged in illegal tree felling.

He cautioned that there should not be conflict between the national and local aspirations. The Himalayas make boundary of the Indian states, as also provided a national cultural yardstick. The test of a well considered development strategy is that it lays the foundation of a permanent economy by increasing the basic components which are oxygen and water on which all life depends.

It must provide a quality of life in which the individual and the society must enjoy permanent peace and fulfilment. Himalayas represent an enormous challenge. He said that a National Policy for the Integrated Development of the Himalayas is most welcome and is the need of the hour. He wished the Expert Group, all his support and thanked the Chairman for providing him an opportunity to express himself fully. The meeting with him lasted for nearly two hours. Some of the views expressed by Shri Bahuguna have been included while formulating the recommendations.

Views of Environmentalists working at the grassroot level on the problems of development in the Himalayan region

Summary of the views of Shri Chandi Prasad Bhatt

A meeting with Shri Chandi Prasad Bhatt was held in the Planning Commission for further discussion on the subject of Integrated Development of the Himalayan region. The meeting was chaired by Dr. S.Z. Qasim, Member, Science, Technology and Environment. Other senior officers representing the various divisions of the Planning Commission were also present.

Any programme of ecological regeneration can not succeed unless the people participate in its planning, management and execution, stated Shri Chandi Prasad Bhatt, during his meeting with the Chairman of Expert Group and other senior staff of the Planning Commission.

Shri Bhatt emphasised that the acceptance of present modes of development should be accompanied by strengthening the base of raw material production of the hills. The NGO's have to be involved in the eco-development programmes to be implemented in these hills. Government must channelise its funds through the committed NGO's for the development packages. He outlined that committed people in the Himalayas should identify common concerns of the government and the governed as far as the struggle against pollution and deforestation is concerned.

Shri Chandi Prasad Bhatt explained his wide experience of working in the Himalayas for its development and restoration of its environment. He said that before any developmental strategy for these hills is planned, we have to 'X-ray' these hills and will have to assess its natural resource endowment. Without such a database, any plan will be a futile exercise. He narrated the genesis of the 'Chipko' Movement of which he is the founder and the role of voluntary organisations in Chamoli (Uttar Pradesh) especially his own organisation Dasholi Gram Swarajya Dal.

Shri Bhatt said that there should be no further economic exploitation of forests because they have an important ecological role in the soil and water conservation. He emphasised the need for eco-friendly agriculture and allied activities like bee-keeping, development of nurseries, silk production etc. for economic development of the people in the Himalayan region. In this regard,

he said that people have to be properly trained to take up new and innovative farm vocations which are harmless to nature.

The most important point raised by Shri Bhatt was the '**role of women**' in the economic development, conservation and preservation of the hills. Women suffer from the worst kind of under-development and are facing drudgery. They become the worst victims of under-development and apathy on the part of Government. Therefore, their training as extension workers and for other purposes is very essential. He said that due to lack of natural resources like forests and other sources of income, men folk tend to squander womens' earnings in undesirable activities. This perhaps may be womens' motivating factor in launching and taking up the Chipko Movement and a drive against liquor and alcohol consumption.

Shri Bhatt indicated his favourable views on the subject of micro and mini hydel projects in the Himalayas. He said that without knowing much about the earthquake-prone areas, forest cover, landslides and other hazards, big dams and projects should not be taken up in the Himalayan region. He mentioned incidents where human lives were lost due to careless construction of dams causing floods. He said that the menace of earthquake in the hills can be gauged from the ferocity of Uttarkashi earthquake. We must learn lessons from this. He said that if poverty has to go from the hills, then we have to remove inaccessibility and equip the people with appropriate technology. He further added that after knowing the details, we can always discuss whether big projects are going to be assets or handicaps. Shri Bhatt also touched upon the areas of tourism, energy, pollution management in the hilly regions. He raised several points which have been included in the report and are reflected in the recommendations. He thanked the Chairman of the Expert Group for providing him an opportunity for expressing his views on the vital subject of Himalayan Development. He also appreciated the efforts and endeavours of Planning Commission for making a comprehensive policy to develop the Himalayan region. The suggestions made by Shri Bhatt have been found very useful while formulating this report.

ANNEXURE - V

Government of India
Planning Commission
(Environment & Forests Unit)

Sub: Expert Group to Formulate National Policy on the Himalayas for an Integrated Development - Minutes of the second meeting held at Shimla from 16th to 19th June, 1992.

List of participants is given at the end of this Annexure.

The meeting was inaugurated by Hon'ble Chief Minister of Himachal Pradesh Shri Shanta Kumar. In his opening remarks Dr. Qasim, the Chairman of the Group, welcomed the Chief Minister and briefly appraised him about the terms of reference of the Group and the deliberations it had during the first meeting. He introduced the Expert Members to the Hon'ble Chief Minister and informed that some major problems had been identified by the Group. The purpose of the second meeting was to enable an appreciation by the expert group of the State's policies, problem areas and perceptions. He added that the group had kept its target as October, 1992 for finalising its report which would be sent to the Prime Minister's Office, concerned Chief Ministers and the Cabinet Secretariat, apart from the concerned Central Ministries. He thanked the Chief Minister for sparing his valuable time and requested him to provide guidance to the Expert Group in regard to his perception of the priorities for the Himalayan region.

The Chief Minister thanked the group for selecting his State for conducting its deliberations. He underlined the need for setting up a National Himalayan Preservation and Restoration fund for the preservation and protection of the Himalayas in an effective manner. He added that this fund should be managed by the Planning Commission and should be used for assisting the concerned State Governments for taking up afforestation and other preservation measures. He outlined the importance of the Himalayas as a repository of the ancient Indian civilisation and culture as well as its vital role in the economy of the country. He added that the attitude and indifference towards the Himalayas had played havoc and that the damage had assumed such dimensions that we can not afford to remain unconcerned about it any more as it had become a question of our survival. The Chief Minister went on to add that environment and man were complementary to each other and one could not be neglected for the benefit of the other. The Chief Minister urged that the hill States at the same time should not be left under-developed and backward in the name of preservation of environment. The Chief Minister also stated that the creation of the Himalayan States had to be seen in its proper perspective. These States had come into existence due to special historical reasons and at no stage was it felt that these

States would be economically viable on a stand-alone basis. The benefits of the Himalayas were being derived by all the States in the country and logically the burden of preservation of the Himalayas should, therefore, also be shared by all the beneficiary States. It was, therefore, clear that liberal grants to these States should be given due to their peculiar situation and special needs of development.

The Chief Minister urged that the Group should work out the inter-se priority of different schemes and make specific and bold recommendations on one or two top priority recommendations which could be taken up on a war footing since all problems cannot be handled simultaneously as they result in thin spreading of resources. To this effect he mentioned about "Van lagao rozi kamao" scheme introduced by the State Govt. which combined (as suggested by its name) two top priorities - afforestation and employment. He added that last year an area of 19,000 ha. had been afforested under this programme and 7,000 jobs had been created. The State Govt. had kept a target of doubling the forest cover and the creation of 75,000 jobs by the end of this century. The Chief Minister advocated the creation of a separate North-Western Council on the lines of North-Eastern Council to tackle the special problems of hill areas of the Western Hill Region. Concluding his speech, the Chief Minister said that he would be anxiously looking forward to the recommendations of the group and promised that the Himachal Govt. would not be found wanting by way of implementation of the recommendations. The Chairman, Dr. Qasim thanked the Chief Minister for his most valuable views and remarks and promised that the points made by the Chief Minister would provide important guidelines to the group's deliberations. He complimented the State Govt. for launching environmental protection activities and pioneering efforts in the field of horticulture and vegetables as a result of which apple was available throughout the country, sometimes cheaper than tomato. He hoped that Chief Minister would take continued interest in this direction.

2. Dr. Jayant Patil emphasised the need for khadi, village and small industries such as matches, soap, bee-keeping and fruit processing industry. To this effect, he suggested that cold chain facilities may have to be suitably provided to enable export of fruit and vegetables. He also suggested a study to establish whether the comparative advantage of Himachal lies in horticulture or agriculture. Dr. Patil felt that NGOs should be involved in the process of protection of environment and extension.

3. Dr. (Mrs.) I.K. Barthakur reacting to the suggestion of the Chief Minister regarding the creation of a North-Western Council stated that NEC was a purely advisory body and the Govt. was having a rethinking regarding its role.

4. Dr. Harsh Gupta submitted that vulnerability of large population in the Himalayas to earthquakes was an important aspect as the entire Himalayan region was a seismically active zone. Earthquakes of large magnitude had already occurred in this region. He added that it is not the earthquake which kills people but the building which crush on human beings. He informed the Expert Group

that some modelling exercises have been done in Departments of Science and Technology to determine the likely damage from the earthquakes of different intensity. Although the exact loss to life and property would depend on the time at which the earthquake occurs, it appears that the damage in the most conservative situation would also be fairly large. He stressed the need to develop a simple proto-type house costing not more than Rs.4000 to Rs.5000 with the help of the Central Building Research Institute which was earthquake proof.

5. Shri Mukherjee, Chief Secretary of Himachal Pradesh Govt. presented his perception of the environmental problems of the Himalayan region. He began his presentation by stating that 'thanks to the inventions of man, the Himalayan region is suffering immense damage'. The problems arising from packaging materials, empty cups, polyethylene bags which were non-biodegradable in nature and were choking the drains and spoiling the beauty of some of the most scenic tourist spots, were also touched upon by him. He also pointed to the fact that most of these products had thrown out of job a large number of people who depended on their conventional bio-degradable products such as 'kullar, paper bags and dona'.

Shri Mukherjee felt that public participation was not solicited in the afforestation programme today. The selection of species of the trees was also such that there was no motivation by the people to preserve the forests. The present policies of the Ministry of Environment and Forests also do not permit the plantation of commercial crops or taking up of horticulture activities. As a result there was no motivation of the people to maintain and protect the species of trees which were of no direct benefit to them. In contrast he gave the instances of 'Chilgoza' tree which was planted in Kinnour and stated that people protected this tree at the cost of their lives. Thus, according to him, at present the species of trees which were permissible under the Forest Act were such that these benefitted only the forest contractors. The narrow sectional interests of the Forestry Department must be avoided and the Ministry of Environment and Forests should reorient the forest policy in such a manner that species such as mango, guava, mulberry, bamboo, eucalyptus and pine should also be grown in forest areas. He further added that under the "Van lagao rozi kamao" scheme of the State Government, the species of trees were so selected that the leaf provided fodder, branch the fuel and the timber the furniture needs. He concluded that unless proper rights were provided there could be no public participation and hence no forest protection. The Chief Secretary also indicated to the Group that genuine fears were being raised that if people were given an access to the forest land they would never move out resulting in permanent encroachments. He, however, felt that it was possible to design suitable measures so that right to land remained with the State but the people could be given the right to plant, right to maintain and right to enjoy a part of the fruit of their labour. To this effect, he mentioned that in 1986 a Tree Patta scheme was introduced but withdrawn by the MOEF for unknown reasons. He felt that a countrywide debate should be launched on the introduction of such a scheme. Touching on the importance of the Himalayan

region, as a big tourist attraction, he submitted that the basic infrastructural facilities in terms of sewage treatment plants and drinking water were lacking in most of these places and a lot of investment would be required if these are to remain safe tourist attractions. Sewage, water supply, civil aviation and infrastructure unfortunately do not yield bankable returns, therefore, he pleaded that resources should be provided by the Centre for these activities. In his opinion the development of hill economy requires large resources. The present methodology of computing special assistance to these States also does not reflect the relative purchasing power of money. He felt that a suitable index should be prepared reflecting the difference in purchasing power of the rupee in the hill areas vis-a-vis the plains. This index could be compiled by the CSO and used for the purposes of deflating the central assistance to different States to give a realistic picture of what was flowing by way of such assistance to the hill areas.

A detailed presentation was made by Shri Mukherji, PCCF and a paper was also circulated by him. The thrust of his arguments was that the value of extraction of forest resources (fuel, fodder, medicinal plants and timber) was far in excess of the investments being made in the forests. This cannot go on without adverse environmental inputs such as soil erosion, deforestation etc. He pleaded for significant flow of financial resources from the Central and Inter-State projects for such works as Catchment Area Treatment and Rehabilitation. He cautioned that siltation rates would reach high levels jeopardising the viability of dams in other States unless substantial Catchment Area Treatment (CAT) was undertaken urgently in the Himachal. The resources must be provided for this. Adviser (E&F) inquired about the extent of CAT and cautioned against loading the project with heavy costs, affecting their very viability. He also cautioned that these costs had to be ultimately borne by the society and unrealistic standards could make the Indian industry unviable. He made it absolutely clear that he was not against CAT per se but against over-loading the projects with costs which were unrelated to it. He inquired whether the extents of CAT, which were being argued, would ever be undertaken if the project does not come up. Therefore, CAT should by and large be tackled through other direct programmes.

Other important issues which came up during the meeting of the Expert Group are as follows:

- Livestock and animal stock is disproportionately high in relation to the carrying capacity of grazing lands which leads to degradation.
- The State Government was requested to provide back up material on industrial policy, water springs, forestry, horticulture, fuel consumption and protection studies.
- On behalf of the State Govt. a case was made for compensation by the Centre for services rendered by the Himalayan region in terms of its hydro potential, irrigation and supply of oxygen.
- Conflicting information seems to be available with regard to role of goats.

- Stall feeding should be encouraged.
- There was a ban on green felling in Himachal Pradesh.
- Information was also sought in regard to medicinal and herbal plants. A visit to Central Potato Research Institute was arranged by the State Govt.
- A presentation was made by the representatives of IPCL and Reliance Petrochemicals on apple packaging. It was decided that a detailed presentation should be arranged in Delhi.
- Alternatives in regard to packaging should be studied more carefully. The main problem seems to relate to the organisation of return trip of empty plastic crates. The suggestion was made for introducing a franchise system on the pattern of soft-drink crates. Major alternatives such as movement of horticulture produce in bulk, design of a national crate versatile enough to handle different commodities, were also raised.
- The Group also visited apple orchards in Narkanda.
- The practice of giving a free head-load for fuel purposes and a tree at Rs. 3 to Rs. 5 per piece to the local population also contributed to substantial deforestation.
- A separate presentation was made by Environment-cum-Science & Technology Department of the State Govt. During their presentation the following points came up:
 1. Dr. Deb (HIPA) and Shri Baldi felt that Himachal ecology had externalities of a positive nature on the rest of the country. These were in terms of peaking load, soil conservation, climate and environmental effects etc. The State Govt. was spending resources to on these externalities and should, therefore, be compensated, particularly in view of its weak financial position.

There was no organised sewage system anywhere in the State. As a result of throwing raw sewage into the river systems, many instances of gastro-entritis had been reported. Rural sanitation plan had been launched as a part of the Himalayan River Action Plan, in view of the fact that most of the population of Himachal was rural it was pointed out that the National River Action Plan under preparation by MOEF does not include any Polluted stretches of the rivers in Himachal. This lacuna requires to be corrected. Member, Dr. Jayant Patil emphasised on cost effectiveness in the construction of lavatories. He emphasised on adopting a model used by Mahatma Gandhi which is still available in Sewa Gram. He felt that the cost should not exceed Rs. 500 per family as against the State Govt. figure of Rs. 3000. Shri Srikant Baldi, Jt. Secretary pleaded for a special LPG supplies for some of the remote areas which are ecologically sensitive. Dr. (Mrs.) I.K. Barthakur suggested that if the vessel is buried deep enough in the ground the problems being faced by the State Govt in regard

to non-availability of biogas during the cold season could be taken care of.

2. It was suggested that the State Department of Science & Technology should interact with the Central Institutes such as the ICAR which had their facilities/laboratories in the State
3. The Chairman suggested an examination of the desalination technology used by the Department of Ocean Development based on reverse osmosis. Plants of this type have been set up at many places.

The meeting ended with a vote of thanks to the Chair.

List of Participants

<u>Sr. No.</u>	<u>Name</u>	<u>Designation</u>
1.	Shri Shanta Kumar	Chief Minister Government of Himachal Pradesh
2.	Dr. S.Z. Qasim	Member, Planning Commission
3.	Dr. Jayant Patil	Member, Planning Commission
4.	Dr(Mrs.) I.K. Barthakur	Principal Adviser, Planning Commission
5.	Shri K. Rajan	Adviser, Planning Commission
6.	Dr. Harsh Gupta	Adviser, Ministry of Science & Technology
7.	Shri M.S. Mukherjee	Chief Secretary, Government of Himachal Pradesh
8.	Shri A.K.Mukerji	Principal Chief Conservator of Forests, Govt. of Himachal Pradesh
9.	Shri S.V. S. Juneja	Member-Secretary, State Pollution Control Board, Govt. of Himachal Pradesh
10	Shri Srikant. Baldi	Joint Secretary, Government of Himachal Pradesh
11.	Dr. Virendra Kumar	Director, Centre for Mountain Environemnt, Delhi University
12.	Shri N.N. Verma	Joint Secretary, Uttaranchal Vikas, Govt. of Uttar Pradesh
13.	Dr. D.K. Sharma	Adviser (Planning) Govt. of Himachal Pradesh

14.	Shri C.L. Sudhera	Addl. Chief Conservator of Forests, Govt. of Himachal Pradesh.
15.	Dr. A.K. Deb	Director, Himachal Pradesh Institute of Public Administration, Govt. of Himachal Pradesh.
16.	Shri R.C.Jhamtani	Joint Advise (E&F), Planning Commission
17.	Dr. Tarsem Chand	Research Officer (E&F) Planning Commission
18.	Sh. A.K. Anand	Environment & Forest Unit, Planning Commission.

ANNEXURE - VI

Government of India
Planning Commission
(Environment & Forests Unit)

Sub: Expert Group to Formulate National Policy on the Himalayas for an Integrated Development - Minutes of the fourth meeting held at Dehradun - Mussouri from 21-23 April, 1993.

List of participants is given at the end of this Annexure.

The fourth meeting of the Expert Group to formulate a National Policy for an integrated development of the Himalayas was held in the Keshav Dev Malviya Institute of Petroleum Exploration (KDMIPE), Dehradun. At the very outset the Secretary, Hill Area Development, Government of Uttar Pradesh Shri R.S. Tolia welcomed the expert group for coming to the Hill regions of Uttar Pradesh for an on the spot assessment of the prevailing conditions. In his inaugural speech Shri Tolia especially thanked the Chairman of the Expert group Dr. S.Z. Qasim for coming to the State and regretted that inspite of the Honourable Governor's keen willingness to grace this meeting, he could not make it due to certain preoccupations. Shri Tolia briefly gave an overview of the problems faced by the hill people in the hills of Uttar Pradesh and made direct references to the earthquake in Uttarkashi and other such phenomena due to negligence in planning and implementation of policies. Shri Tolia introduced his other fellow officers and heads of different departments like the Department of Non-conventional Energy Sources, Laghu Jal Vidyut Nigam, Health, Industries, Horticulture, Agriculture, Tourism etc. Besides, he also thanked ONGC for providing the platform for the discussions on this important and vital subject.

The Chairman of the Expert group Dr. S.Z. Qasim thanked the ONGC authorities for the facilities extended to the Expert Group members and for holding the meeting in KDMIPE. He explained the genesis of the constitution of Expert Group and said that the purpose of this meeting was to assess the carrying capacity as well as the holding capacity of the hill regions in this part of U.P. He mentioned that at the behest of NDC meetings and due to other prevalent conflicting views on the subject and above all having been asked by the Planning Commission to study the problems of Himalayas, this Expert group is trying to formulate comprehensive recommendations which would help way in developing a policy for the fragile Himalayas. Dr. Qasim mentioned that the Himalayas are our greatest asset. Without the Himalayas there would have been a cascading effect on the economy as the agriculture would not have flourished. He pointed out that there is a deminishing quality of environment in all the mountain regions of the world. But in developing countries it has become a very serious problem. Himalayas being the youngest mountain are beset with this problem in a more acute form. Moreover, these mountains are under-utilized. Dr. Qasim further

added that for development of Himalayas an institutional arrangements would be worked out based on the recommendations of the Himalayan states and other relevant information in the field so that this region remains at par with the other regions.

Shri Tolia gave a brief overview of the Uttaranchal (U.P. hills) Area and its problems. He mentioned that this area constitutes about 4.3% and 17.4% population and area respectively of the State. It is a sensitive border area. In addition to its varied and multiplicity of general problems like the degradation of environment/ecology, poverty, unemployment and out-migration of youth, inadequacy of essential infrastructure facilities, relatively much higher cost of projects/unit cost, essential infrastructure including the long gestation period as also low returns on the investments in the hills etc., the following peculiar problems are growing fast:

- (a) Darjeeling like unrest and separatist feelings among the people resulting in pressing demand for separate Uttaranchal State.
- (b) Terai belt/foothills are engulfed with terrorist activities which have brought fury and fright and endangered the life and security of the people.
- (c) this area is also under critical seismic zone and has already suffered heavy losses on account of recent earthquake.

The U.P. Himalayas extend over Eight districts viz. Nainital, Almora and Pithoragarh in the Kumaon region and Garhwal, Chamoli, Uttarkashi, Tehri and Dehradun in the Garhwal region. The total geographical area of these eight hill districts is 51,125 square kilometres. From these mountains emerge a number of important rivers viz. Ganges, Yamuna, Kali, Dhaul, Gori, Ramganga, Alaknanda, Bhagirathi, Tons etc. These major rivers have their catchments separated by secondary mountain ranges arising from the main axis and run mainly from the North-East to the South-West.

Considering the emerging problems of the Uttaranchal, Shri Tolia cautioned that this Expert group should look into the desired imperatives of safeguards and special treatment like the special category states/border states for this area also by the central government. In this context, sincere efforts and considerations are called for to assist Uttar Pradesh. He and others outlined the problems of the U.P. Uttaranchal as under-

1. The area being a border and sensitive area Central Assistance under the Border Area Development Programme must be granted.
2. Maintenance cost of assets, particularly in respect of roads/bridges, irrigation and power projects must be provided.
3. Environmental/ecological security being crucial for the hill projects, soil and water conservation, watershed management, rainwater harvesting

structures for these hills must be funded on 100% Central Assistance basis.

4. Infrastructure, industries and other institutional back-ups are more or less absent in the U.P. Hills resulting in poor economy. Central Public Undertaking could play an active role in industrialising these hills.
5. In the field of tourism, the development of tourist complexes and other tourist facilities have to be assisted and the major cost for this must be borne by the Central Government.
6. Another important point which came up for discussion was regarding reserving large chunks of areas and big tracts of forests for various purposes. In fact, Uttar Pradesh is the only State in which very large area under the forest cover has been designated as sanctuaries, national parks and biosphere reserves by the Centre. Therefore, in these areas the question of any economic activity does not arise. The remaining forest area is not supposed to be large enough to promote large scale activities such as apple plantation or intensive horticulture. On this account the state government suggested that the State of U.P. should be adequately compensated by the Centre. The amount of forest area blocked for different purposes in the state is 3,65,20 hectares.
7. Unemployment was identified as one of the major problems in the region. There is a very high intensity of unreported disguised unemployment in the area. Educated unemployment is increasing because work opportunities are few. About 70,000 job seekers get themselves registered in the employment exchanges but the average generation of employment is only 3000 in the organised sector. The industrial structure is weak and is skewed in favour of plain areas at the foot hills. The women folk have to shoulder the burden of economic activities besides that of the household chores. The depletion of natural resources has increased their woes further.
8. The protection of existing forests has become one of the biggest problems in the foot hill and Terai areas of this region. Illegal felling by timber mafias, encroachment of forest land and other illicit activities, have increased and are now beyond control with the present means available with the forest department. While great emphasis is being laid on afforestation activities, the protection and maintenance of the existing forests are getting less and less attention. During the Seventh Plan period, only 2.9% of the total expenditure was allocated for forest protection. Under the present circumstances and considering the magnitude of the problem, this amount is far below from the actual requirement. Reserved forests - out of the forests that are under the control of the forest department 1973 sq. km are protected forests 1536 sq.km unclassified forests and the rest are reserved forests. About

6138 sq.km of reserved forest area constitutes as snow cover, rocky and unproductive blanks.

9. Small and marginal farmers who constitute 70-80% of the total number of cultivators are mostly cultivating unirrigated, marginal and sub marginal lands where yield is poor. These farmers are unable to invest and then sustain through gestation period for the growth of fruit, fuel and fodder trees without external aid. Agriculture on the high slopes (more than 30°) has resulted in the acceleration of the run off and the resultant disruption of the ground water region. Many natural springs have either vanished or suffered depletion in such an output. All these have resulted in the utter imbalance of the entire ecosystem. To encourage cultivation of cash crops, a scheme of rajma (beans) production has been initiated in the hill region. Scheme relating to off-season vegetables, mushroom cultivation and training schemes have also been sanctioned. Private nurseries are being encouraged. A Marketing Intervention Group has been set up for coordinating and taking care of the marketing aspects of agricultural/horticultural produce and also for the industrial products. About 600 tonnes of fruits have been marketed last year. Animal husbandry is a very important component for the maintenance and repair of ecosystem. It is all the more important for the success of afforestation programme. It was, therefore, suggested that besides fodder and pasture development many other programmes need urgent attention.
10. Shri S.S. Pangti, Director General, Tourism, Government of U.P. in his presentation before the Expert Group raised the problems pertaining to tourism in U.P. hills. He mentioned that in this sector great change is taking place. Air strips are being developed at Gauchar, Uttarkashi, Chamoli and Chinyalisain for quicker transport of tourists. Adventure tourism is being encouraged. Winter sports are becoming popular. It is proposed to set up a separate directorate for promoting adventure tourism in the region. Moreover, other tourist activities will be promoted and related infrastructure for these will be suitably strengthened. The office of the director general tourism (Uttaranchal) will be suitably strengthened to be more effective. Shri Pangti further suggested that tourism can play a role of industry in an effective manner and can earn a lot of revenue because of the natural beauty of the Himalayas, places of pilgrimage, adventure sports venues and other such localities. He said that the maintenance of the roads and several other facilities will have to be assisted by the Central Government.
11. The backwardness of the region, it was reported, was due to the backwardness of educational facilities in the region. But the state government successfully undertook a massive programme of educational and allied activities in the hill areas and as a result of this the literacy

percentage has reached 48.51%, while the literacy percentage of the whole state is 41.71%. But due to shortage of available resources such as the shortage of teachers, buildings and other amenities much remains to be done.

12. ONGC in their presentation regarding fuel and energy needs of the Himalayan region in the next century explained the scenario of oil exploration, distribution and other allied activities in the Himalayas. Dr. A. Bhattacharyya, representing the ONGC, gave an account of the Himalayan region *vis-a-vis* its categorisation in different zones. He mentioned that the entire Himalayan region could be placed in the category I & IV as far as sedimentary, oil bearing basins in India are concerned. Category I denotes the basins known to be hydrocarbon bearing on a commercial scale as in Assam, Tripura and West Bengal and Category IV means sedimentary basins of indeterminate prospects. Other plans of the ONGC regarding the formation of a National Grid etc. were also unveiled. The predictions regarding the oil production and gas production running upto the beginning of the next century were also predicted by the ONGC experts.

Dr. N.S. Jodha from ICIMOD, Kathmandu in his paper also brought out the problems of poverty and its causes in the Himalayan region. According to him the basic reasons for the poverty are inaccessibility, fragility, marginality, diversity and niche which prevent a proper utilisation of mountain resources. He further mentioned that ICIMOD is engaged in a comprehensive and eco-friendly development of the Himalayan region and is the first International Centre in the field of mountain area development. Dr. Jodha explained the limitations in natural resources utilisation for mountain development. These ultimately lead to diversity in the peoples' approach and its remedy lies in an integrated approach involving a full understanding of the mountain problems and their solutions.

Other departments of the Government of Uttar Pradesh also participated and made suggestions for the development of Himalayan region in an eco-friendly manner. These departments included power, non-conventional energy, irrigation, horticulture, small scale industries, etc.

The meeting ended with a vote of thanks to the Chair.

The Chairman, Expert Group Dr. S.Z. Qasim along with the other senior officers and some members of the Expert Group, visited Mussourie for on the spot observations of problems connected with limestone quarrying, deforestation, tourism etc.

List of Participants

<u>Sl.No</u>	<u>Name & Designation</u>
1.	Dr. S.Z. Qasim, Chairman
2.	Dr. R.S. Mann, Member, Expert Group
3.	Dr. A.N. Purohit, Member, Expert Group
4.	Dr. Virendra Kumar, Member, Expert Group
5.	Shri K. Rajan, Adviser (E&F), Planning Commission
6.	Dr. N.S. Jodha, Director, Mountain Farming Systems, ICIMOD
7.	Shri R.S. Tolia, Secretary, Hill Area Development, Govt. of Uttar Pradesh
8.	Shri S.S. Pangti, Director General Tourism, Govt. of Uttar Pradesh
9.	Shri Shishir Priyadarshi, District Magistrate, Dehradun
10.	Dr. A.Bhattacharyya, Economic Adviser, ONGC, New Delhi
11.	Shri R.V. Khanduri, Dy. General Manager, Support Services, ONGC
12.	Shri Suresh Kumar, Dy. General Manager, ONGC
13.	Dr. V.C. Thakur, Director, Wadia Institute of Himalayan Geology, Dehradun.
14.	Shri Keite Virgo, Team Leader, Watershed Directorate, Dehradun.
15.	Shri M.S. Bisht, Chief Conservator of Forests (Garhwal), Dehradun.
16.	Dr. D.S. Rathore, Director of Horticulture & Food Processing, (U.P.Hills).
17.	Shri B.P. Maleta, Chief Project Director, Watershed Management Directorate, Dehradun.
18.	Shri R.S. Singh, Managing Director, U.P. Jhal Nigam, Lucknow.
19.	Shri A. Tripathi, Chief Engineer, (Garhwal & Kumaun), U.P. Jhal Nigam, Dehradun.
20.	Shri A.K. Hangal, Managing Director, U.P. Laghu Jal Vidyut Nitam Ltd., Govt. of Uttar Pradesh, Lucknow, U.P.
21.	Shri Shailesh Krishna, Director, Department of Non-Conventional Energy Agency (DNEA), Govt. of Uttar Pradesh
22.	Shri Y.K. Gupta, Chief Engineer, PWD, Lucknow.
23.	Shri P.K. Sharma, Chief Engineer, PWD, Garhwal.
24.	Shri I.P. Singh, Director (Environment), U.P. Lucknow.
25.	Shri D.D. Bahuguna, Director of Employment & Trg. U.P., Lucknow
26.	Shri H.P. Uniyal, G.M., Garhwal Jal Sansthan

27. Shri N.C. Shah, Director, Herbal Research & Development Institute (Uttaranchal)
28. Shri R.S. Kushwaha, Chief Dairy Development Officer (Uttaranchal), Shrinagar
29. Shri K.G. Singh, OSD, Uttaranchal Development Department, Lucknow
30. Shri D.C. Manya Executive Engineer, U.P. Laghu Jal Vidyut Nigam, Dehradun.
31. Shri I.H. Usmani, Deputy Director of Education, Pauri
32. Shri Chetan Gurung, Correspondent, Doon Darpan
33. Shri Ashok P. Mishra, Correspondent, Himachal Times,
34. Shri D.S. Rawat, Correspondent, Amar Ujala,
35. Shri A.K. Misra, Districts Savings Officer, Dehradun & OSD for the Conference.
36. Shri R.C.Jhamtani, Member-Secretary, Expert Group
37. Dr. Tarsem Chand, Nodal Officer, Planning Commission
38. Shri Chandra Bhan, Planning Commission.

ANNEXURE - VII

Government of India
Planning Commission
(Environment & Forest Unit)

Sub: Minutes of the Vth meeting of the Expert Group to formulate a National Policy for an Integrated Development of Himalayas held in Shillong (Meghalaya) between 21-23rd May, 1993.

List of participants is given at the end of this Annexure.

At the very outset the Chief Minister of Meghalaya Shri S.C. Marak welcomed the members of the Expert Group for visiting Meghalaya for holding this meeting and expressed his thankfulness to Hon'ble Prime Minister for setting up such an expert group for specifically looking into the problems of the Himalayas and its people. He also specially thanked the Chairman of the Expert Group Dr. S.Z. Qasim for choosing Shillong, in the North Eastern Sector for such a prestigious meeting. The Hon'ble Chief Minister briefly mentioned the problems which are ailing the Himalayas for quite sometime and warned that if timely action is not taken it will lead to wide-spread human misery which will be uncontrollable. He mentioned that major problems of the Himalayan region, particularly of the North-East are, soil erosion, deforestation, unemployment among the youth, unsustainable development etc. He said that emphasis should be on assessing the carrying capacity as well as holding capacity of the region. Besides this, short and long term resource requirements of the whole region will have to be assessed before any comprehensive programme is chalked out for the region. In this direction, exploitation of the hill resources for the progress of the national economy has also to be taken into account, particularly as the Hills are land locked. Devices for exploiting land based resources will have to be specially developed for the hilly areas of North-East. Development and adoption of environment-friendly technologies should be the guideline. Hon'ble Chief Minister remarked that the problem of North Eastern Hills States are special and peculiar to this region. In this regard he mentioned 'jhum' cultivation and referred it as a way of life for the local people. But he explained the dangers involved and wanted that people should now shift towards other modes of cultivation as a progressive measures such as "intensive cultivation" on the hill slopes. In this context, he pointed out that the formulae developed in the other parts of the country should not be blindly implemented in these hills because permanent cultivation is a far cry for the time being. The Chief Minister informed that in Meghalaya the State Govt. has succeeded in increasing the forest cover. This unique achievement has also been confirmed by satellite imagery. This also tells upon the peoples' shifting away from the shifting cultivation.

The Minister for forests, expressed his happiness on the initiative taken by the Planning Commission for developing a policy for the Himalayas. He

expressed that there was a long standing need for a systematic national policy for development, conservation, preservation and upkeep of the mighty Himalayas. He supported that the Himalayas are a life line for the National Economy. The way these Hills are facing systematic deforestation is alarming. He also outlined that the problem of soil erosion, overgrazing, removal of forest cover and unemployment are the central ones. In this regard, he mentioned that there should be a National Livestock policy as also a policy for the village and cottage industry keeping in view the peculiar situation of the North Eastern Sector. He explained that in Meghalaya the land belongs to the people. Therefore, any policy made for this region must have peoples' approval and must be welcomed by the people. For the economic development of the region, he suggested that 'Horticulture' can play an important role. He underlined the need for cultivation of orchards, bamboo, cane, broomstick etc. for this purpose.

The Chairman of the Expert Group Dr. S.Z. Qasim welcomed the Hon'ble Chief Minister on behalf of the Expert Group and thanked him for gracing the occasion. He observed that although it is his first visit to this State, but he admires the progress and awareness among the people of the State. He showed his happiness towards a better standard of living of the people of this State, as is obvious from the ways people lived, looked and dressed. He went on to describe the genesis of the Expert Group on the Himalayas and expressed the hope that the recommendations of this group would help in bringing in prosperity in the fragile Himalayas. He observed that the Himalayas are the greatest gift of Nature to India. Had there been no Himalayas there would not have been monsoon on which the livelihood of millions of people depends. He lamented that the mountain regions all over the world are being subjected to great pressure to fulfil many of our economic needs without much regard to their ecology. This is a very serious problem. Himalayas being the youngest mountain are beset with this problem in a more acute form.

The Chairman of the Expert group further said that we all depend on the Himalaya for water, wood, fruits, energy etc. But due to deforestation, the occurrence of floods has become a regular feature. Although the Himalayas come under different climatic ranges, now the Himalayan chain is in danger of a major climatic catastrophe. Therefore, something must be done to save the Himalayas. This issue and several others have been highlighted during the meetings of the National Development Council (NDC), and thus the role of the Expert Group has added importance in this regard. The Chairman thanked the Hon'ble Chief Minister for setting the tone for discussions of the meeting. The Chairman asked the Chief Minister specifically about the idea of having an 'Apex Body' called the "Himalayan Development Authority". Hon'ble Chief Minister readily endorsed the idea of having an apex body. The Hon'ble Chief Minister also agreed to the idea of having an Eco-development fund for the Himalayan States. Dr. Qasim also recalled his meeting with the Union Finance Minister Dr. Manmohan Singh who happened to be in Shillong at that time and said that he showed a keen interest in the development of the hill states and also

appreciated the efforts being made by the Expert Group appointed by the Planning Commission.

Dr. Jayant Patil, Member, Planning Commission thanked for extending invitation to him for this meeting to the Chairman of the Expert Group and the Chief Minister of Meghalaya. He said that the North Eastern States have a great potential for Development. He expressed that he had long attachment with the North-Eastern Sector. He expressed his sadness over the deforestation taking place in the Himalayas. He said that we are aiming at a very challenging work as the preservation and the eco-friendly development of the Himalayas require a great effort. He identified the problem of educated unemployed youth as the most pressing problem of this region. He said that this is the problem of human management which has to be tackled in all earnestness. He recounted his 40 years' experience among the tribals and emphasised that horticulture can play an important role in their development. He advised that modern techniques such as tissue culture have to be adopted in this field. He recommended the cultivation of small cardamom, black pepper, cinnamon etc. for this region. In this regard, he mentioned about his discussions with Dr. Manmohan Singh yesterday and said that the Finance Minister appreciated the idea of introducing the nurseries and mentioned that from these nurseries the supply of plants should be given to the tribals.

Shri R. Lyngdoh, Minister for Public Health Engineering, Govt. of Meghalaya in his remarks expressed his happiness on conducting the meeting of the Expert Group in Shillong. He underlined the major problems of the State as soil erosion, tree felling and unemployment. To this end, he mentioned that we are using social forestry. But due to the ownership pattern of the land (only 3% being controlled by the State Govt.), it is difficult to achieve a major success. He gave another suggestion of encouraging people to have free plantations of horticulture plants and wanted the Central Government to take up the initiative in this regard. He pointed out that to achieve the desired objectives, more expertise and finances are required. Therefore, an apex body and a separate fund for these States is a must.

Mr. D.D. Lapang, Chairman, State Planning Board also described the various problems being faced by the State and the entire north eastern sector. He endorsed the views of the Chief Minister on Jhum cultivation and said unless we provide other vocations to the people, they would not give up this practice. He also stressed the need for harnessing the hydro power potential of the Hill States and mentioned that his State is surplus in power, thanks to their tapping of the hydro electric potential. He wanted more flow of funds to the State for taking up schemes for generating employment for the youth and for the development of infrastructure.

Sh. S.K. Sinha, Chief Secretary, Govt. of Meghalaya while opening the business session of the meeting, expressed the need to break the psychological barrier of the people in adopting new technologies and modern farm practices.

He described the paramount role of the District Council in Meghalaya and said that we must take them into confidence before embarking on any new path. He pointed out that to improve the economic conditions of the people, large deposits of sulphur-rich coal, found in the State may be exploited. He also underlined the need for the increased utilization of hydro potential in the State. He described jhuming as the way of life of the people of this region. He said any amount of force can not stop them from doing this. For this we have to develop new methodologies as the soil is not very rich and when the former switches on to a regular practice of agriculture the yield is only 1.8 times more, but in agriculture the care is many times more (8 visits). That is why people prefer jhuming. The State has a good potential of tea plantation. He touched upon the issue of credit facilities existing since the British days. People do not go for credit. Rubber also has a good potential in these hills. All the three tribes such as Garo, Khasi and Jaintia are now progress minded. Shri Sinha also mentioned about the dairy potential and its need for development.

The Principal Chief Conservator of Forests(PCCF), in his detailed presentation on Forestry gave an account of the Forest wealth of the State. A detailed note on 'Profile' of Forest Management' was circulated by him for consideration of the Expert Group. The Chairman enquired about the potential and tapping of the medicinal plants in the State. PCCF mentioned that now Rauwolfia and other similar plants are being used for this purpose.

The Chairman enquired about the condition of reserve forest in the State. It was mentioned that only 4% belongs to the Govt., while the rest is privately owned. The Tarlok Singh Committee also visited the State in 1963 for the study of the problems of the State in this regard. Dr. Jayant Patil enquired about the growth pattern potential of Melina arborea but it was replied that it does not have good growth in these hills. Mentioning about the spice production in the State, Mr. F. Suchiang observed that it was tried but not with much success. The cost of collection itself was more than the market price. He added that in the case of forestry, the cost of labour input was very high. Therefore, tree cultivation is only used by large farmers but this form of land use is desirable for the States.

In his intervention, the Adviser (Agriculture, E&F) Shri K. Rajan stressed the need for using modern techniques of agriculture in the north-eastern regions. He said that it is difficult to agree with the view that people have left agriculture for forestry but it may be because of other activities. He mentioned that people of Meghalaya and Punjab can not be compared as the people of Punjab have enough to eat. For tree farming people can not starve for 7-8 years as trees take that long to grow. He pointed out that tea cultivation have been taken up by the Agriculture Department but the problem is that every family must have at least 2 ha. of tea. He suggested that tea growing can be an alternative to jhum. But, he emphasised that there should be processing facilities for green tea in Meghalaya itself. The green tea is being taken to Assam for further processing. He further said that development of north-east should be viewed in overall Indian context and proper linkages established for this purpose.

Sh. R. Dutta, Principal Secretary (Forests) Govt. & Meghalaya gave a valuable presentation before the Expert Group and summed up the various problems of the North-Eastern region. He also gave a detailed write-up which was found useful by the Expert Group.

The representative of the Government of West Bengal made a presentation on the hills and the development of the hilly region of West Bengal. It was mentioned that Darjeeling forest reserves is moist and deciduous. Joint Forest Management Technique is being implemented for protecting the forests. Medicinal plants are also being cultivated to supplement the income of the local people.

Arunachal Pradesh representative in his presentation said that 62% of the total area of the State is forest. The State forest has 20 rare species. The practice of jhuming is prevalent for which the forest department is trying hard to control by using incentives. Tree plantation is also being popularised. 'Apna Van Scheme' is being implemented under which the plantations are created and maintained for 3 years. Similarly, village reserve forests or 'Anchal Reserve Forests' schemes are being implemented. For economic upliftment of the people, a wood-based industry has been started. Due to poor communication facilities, and the absence of roads, the pace of development is slow but tourism activities are being promoted in a big way. These activities are adventure tourism, cultural tourism, wild life tourism etc.

The meeting ended with a vote of thanks to the Chair.

<u>Sl.No</u>	<u>Name & Designation</u>
1.	Dr. S.Z. Qasim, Member, Planning Commission
2.	Dr. Jayant Patil, Member, Planning Commission
3.	Shri S.C. Marak, Chief Minister, Meghalaya
4.	Shri A.C. Marak, Forest Minister
5.	Shri R. Lyngdoh, Minister, Public Health Engineering
6.	Shri D.D. Lapang, Chairman, State Planning Board
7.	SHri K.K. Sinha, Chief Secretary, Meghalaya
8.	Shri R. Dutta, Principal Secretary, Forests, Meghalaya
9.	Shri S.S. Patnaik, Adviser (Forests/Env.), North-Eastern Council
10.	Shri K.G. Deb Krori, Adviser (Irrigation FC and WSM), North-Eastern Council
11.	Dr. A.N. Sarkar, Adviser (Agri. Horti.Fishery), North-Eastern Council.
12.	Dr. Tarsem Chand, Planning Commission
13.	Shri S. Kumar, Conservator of Forests (Horticulture), Govt. of Meghalaya.
14.	Shri T.T.C. Marak, Conservator of Forests (Wildlife), Meghalaya

15. Shri V.K. Nautiyal, Managing Director, FDCM Ltd.,
16. Shri R.C. Khongnia, Director (Agri)
17. Shri W. Dhar, Director (Animal Husbandry)
18. Shri H.G. Momin, Director Soil Conservation
19. Shri A.K. Anand, Planning Commission, New Delhi
20. Shri R.K. Gambir, Planning Commission, New Delhi
21. Shri Balkishan, Planning Commission, New Delhi.
22. Shri Mohan Singh, Planning Commission, New Delhi
23. Shri R.S. Naik, Dy. Director(Planning) Sericulture
24. Shri A. Pariat, Programme Executive, N.E.S.A.I.R. Shillong
25. Shri C. Juita, Representative, Meghalaya Guardian, Shillong
26. Dr. H.K. Chamuah, Dy. Director of Agriculture, Meghalaya Shillong.
27. Shri J. Gogoi, Dy. Director of Agriculture (Planning)
28. Dr. A.K. Lahiri, M.D. Waste Land Dev. Corporation, West Bengal
29. Shri D.S. Prasad, Member (Tech.), Meghalaya State Electricity Board (MSEB)
30. Smt. E. Lyngdoh, Tourist Officer, Director of Tourism, Meghalaya
31. Shri B. Bhattacharya, C.E. (C), Meghalaya State Electricity Board.
32. Shri K.F. Rangad, Director Industries, Meghalay
33. Shri M.P. Hazarika, DIPR - North East Council
34. Shri Ashish Kumar, Director (E&M) - North East Council
35. Dr. M. Ramachandran, Director (Renewable Resources of Energy) and Adviser (Power), North East Council
36. Dr. R.N. Prasad, Director, ICAR, Research Complex, Barapan, Meghalaya
37. Dr. A.N. Sarkar, Adviser (Agriculture), North East Council
40. Shri Balvinder Singh, Principal Chief Conservator of Forests, Department of Forests, Government of Meghalaya, Shillong.
39. Shri Kishore Rao, Conservator of Forests, Govt. of Arunachal Pradesh
41. Shri F. Suchiang, Chief Conservator of Forests, Department of Forests, Government of Meghalaya, Shillong/
42. Shri P.S. Nongbri, Divisional Forest Officer, Government of Meghalaya, Shillong.

ANNEXURE-VIII

Land Utilisation Pattern in Himalayan States

Classification	Arunachal Pradesh		Assam		Himachal Pradesh	
	Area (Lakh Hect.)	To Report- ing Area	Area (Lakh Hect.)	To Report- ing Area	Area (Lakh Hect.)	To Report- ing Area
I. LAND USE						
Forests	52.5	93.7	19.8	25.2	10.4	30.9
Area Put to non-agri- cultural uses	0.3	0.6	9.1	11.6	1.9	5.6
Barren & un-cultu- rable land	0.5	0.9	15.4	19.6	1.8	5.3
Permanent pastures & grazing lands	—	—	1.8	2.3	11.3	33.5
Land under misc. tree crops & groves	0.4	0.7	2.5	3.2	0.5	1.5
Culturable waste	0.0	0.0	1.0	1.3	1.3	3.9
Old fallow	0.5	0.9	0.8	1.1	0.2	0.6
Current fallow	0.3	0.5	0.9	1.2	0.5	1.5
Net sown area	1.5	2.7	27.1	34.5	5.8	17.2
Reporting area	55.5	100.	078.5	100.0	33.7	100.0
Gross cropped area	2.5		37.5		9.7	
Cropping intensity (%)	166.7		138.4		167.2	
Gross irrigated area	0.3		5.7		1.7	
Percent of gross irri- gated area to gross cropped area	12.0		15.7		17.5	
					17.3	
II. CROPPING PATTERN						
	Area (Lakh Hect)	%To gross cropped area	Area (Lakh Hect)	%To gross cropped Area	Area (Lakh Hect)	To gross cropped Area
CROPS						
Rice	1.2	48.0	24.4	65.1	0.9	9.3
Wheat	-	-	0.9	2.4	3.7	38.1
Coarse cereals	0.6	24.0	0.4	1.1	3.7	38.1
Pulses	0.1	4.0	1.1	2.9	0.4	4.1
Foodgrains	1.9	76.0	26.8	71.5	8.7	89.6
Oilseeds	0.2	8.0	3.4	9.1	0.2	2.1
Fibres	-	-	1.1	2.9	-	-
Sugarcane	-	-	0.4	1.0	-	-
Other crops	0.4	16.0	5.8	15.	50.8	8.3
Gross cropped area	2.5	100.0	37.5	100.0	9.7	100.0

Land Utilisation Pattern in Himalayan States

Classification	Jammu & Kashmir		Manipur		Uttar Pradesh	
	Area (Lakh Hect.)	To report- ing area	Area (Lakh Hect.)	To report- ing area	Area (Lakh Hect.)	To report- ing area
I. LAND USE						
Forests	27.5	61.0	6.0	27.1	51.6	17.3
Area put to non-agri- cultural uses	3.1	6.9	0.3	1.4	24.2	8.1
Barren & un-cultu- rable land	2.8	6.2	14.2	64.3	10.3	3.5
Permanent pastures & grazing lands.	1.3	2.9	—	—	2.9	1.9
Land under misc. tree crops & groves.	0.7	1.5	0.2	0.9	5.8	1.9
Culturable waste	1.4	3.1	—	—	10.6	3.6
Old fallow	0.1	0.2	—	—	8.9	3.0
Current fallow	1.0	2.7	—	—	11.4	3.8
Net sown area	7.2	15.5	1.4	6.3	172.3	57.8
Reporting area	45.1	100.0	22.1	100.0	298.0	100.0
Gross cropped area	10.6		1.8		253.5	
Cropping intensity (%)	147.2		128.6		147.1	
Gross irrigated area	4.3		0.8		143.8	
Percent of gross irri- gated area to gross cropped area	40.6		44.4		56.7	
II. CROPPING PATTERN						
	Area (Lakh Hect)	%To gross cropped area	Area (Lakh Hect)	%To gross cropped area	Area (Lakh Hect)	To gross cropped area
CROPS						
Rice	2.8	26.4	1.6	88.9	54.3	21.4
Wheat	2.4	22.6	—	—	86.4	34.1
Coarse Cereals	3.3	31.1	0.1	5.6	34.6	13.6
Pulses	0.4	3.8	—	—	30.3	12.0
Foodgrains	8.9	83.9	1.7	94.5	205.6	81.1
Oilseeds	0.7	6.7	—	—	9.3	3.7
Fibres	-	-	—	—	0.4	0.2
Sugarcane	-	-	—	—	17.6	6.9
Other crops	1.0	9.4	0.1	5.5	20.6	8.1
Gross cropped area	10.6	100.0	1.8	100.0	253.5	100.0

Land Utilisation Pattern in Himalayan States

Classification	Meghalaya		Mizoram		Nagaland	
	Area (Lakh Hect.)	To Report- ing area	Area (Lakh Hect.)	To Report- ing area	Area (Lakh Hect.)	To Report- ing area
I. LAND USE						
Forests	9.4	42.0	13.0	61.9	8.6	57.0
Area put to non-agri- cultural uses	0.9	4.0	0.1	0.5	0.3	2.0
Barren & un-cultu- rable land	1.4	6.2	2.0	9.5	—	—
Permanent pastures & grazing lands	—	—	—	—	—	—
Land under misc tree crops & groves	1.5	6.7	—	—	1.2	7.9
Culturable waste	4.9	21.9	0.8	3.8	1.0	6.6
Old fallow	1.7	7.6	2.6	12.4	1.1	7.3
Current fallow	0.6	2.7	1.8	8.6	1.1	7.3
Net sown area	2.0	8.9	0.7	3.3	1.8	11.9
Reporting area	22.4	100.0	21.0	100.0	15.1	100.0
Gross cropped area	2.4		0.7		2.0	
Cropping intensity (%)	120.0		100.0		111.1	
Gross irrigated area	0.4		0.1		0.6	
Percent of gross irri- gated area to gross cropped area	16.7		14.3		30.0	
II. CROPPING PATTERN						
	Area (Lakh Hect)	%To gross cropped Area	Area (Lakh Hect)	%To gross cropped Area	Area (Lakh Hect)	To gross cropped Area
CROPS						
Rice	1.1	45.8	0.5	71.4	1.3	65.0
Wheat	—	—	—	—	—	—
Coarst cereals	0.2	8.4	0.1	14.3	0.3	15.0
Pulses	—	—	—	—	0.1	5.0
Foodgrains	1.3	54.2	0.6	85.7	1.7	85.0
Oilseeds	0.1	4.2	—	—	0.1	5.0
Fibres	0.2	8.3	—	—	—	—
Sugarcane	—	—	—	—	—	—
Other crops	0.8	33.3	0.1	14.3	0.2	10.0
Gross cropped area	2.4	100.0	0.7	100.0	2.0	100.0

Land Utilisation Pattern in Himalayan States

Classification	Sikkim		Tripura		West Bengal	
	Area (Lakh Hect.)	To report- ing area	Area (Lakh Hect.)	To report- ing area	Area (Lakh Hect.)	To report- ing area

I. LAND USE

Forests	2.6	36.6	6.1	56.1	10.9	12.3
Area put to non-agri cultural uses	1.0	14.1	1.3	12.4	16.3	16.4
Barren & un-cultu- rable land	1.7	23.9	—	—	1.9	2.1
Permanent pastures & grazing lands.	0.7	9.9	—	—	0.1	0.1
Land under misc. tree crops & groves.	0.1	1.4	0.4	3.6	0.5	0.6
Culturable waste	—	—	—	—	1.1	1.2
Old fallow	0.1	1.4	—	—	0.5	0.6
Current fallow	—	—	—	—	4.0	4.5
Net sown area	0.9	12.7	2.7	25.7	53.3	60.2
Reporting area	7.1	100.0	10.5	100.0	88.5	100.0
Gross cropped area	1.5		4.2		83.5	
Cropping intensity (%)	166.7		155.6		156.7	
Gross irrigated area	0.2		0.4		19.1	
Percent of gross irri- gated area to gross cropped area	13.3		9.5		22.9	

II. CROPPING PATTERN	Area (Lakh Hect)	%To gross cropped Area	Area (Lakh Hect)	%To gross Cropped Area	Area (Lakh Hect)	To gross Cropped Area
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CROPS

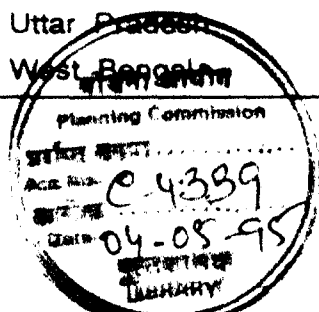
Rice	0.2	13.3	2.5	59.5	56.1	67.2
Wheat	0.1	6.7	—	—	3.2	3.6
Coarse cereals	0.5	33.3	—	—	1.0	1.2
Pulses	0.1	6.7	0.1	2.4	3.1	3.7
Foodgrains	0.9	60.0	2.6	61.9	63.4	75.9
Oilseeds	0.1	6.7	0.2	4.8	5.3	6.4
Fibres	-	-	0.1	2.4	4.4	5.3
Sugarcane	-	-	—	—	0.2	0.2
Other crops	0.5	33.3	1.3	30.9	10.2	12.2
Gross cropped area	1.5	100.0	4.2	100.0	63.5	100.0

Horticulture Production In Himalayan States

Name of the State	Fruits		Vegetables	
	Total Area (ha.)	Total Production (Tonnes)	Total Area (ha.)	Total Production (Tonnes)
1. Arunachal Pradesh	17157	38432	10530	26529
2. Assam	69124	823396	1509777	2036497
3. Himachal Pradesh	156469	459990	39800	544200
4. Jammu & Kashmir	168358	603500	15300	106800
5. Meghalaya	23280	202928	22568	166881
6. Mizoram	7192	34936	5070	43766
7. Tripura	41035	324750	29600	287400
8. Nagaland	3872	6712	5288	41358
9. Sikkim	11800	24000	10580	67560
10. Uttar Pradesh	165772	345535	42283	200000
11. Manipur	18730	127350	12030	37100

Cattle Population In Himalayan States (X 000)

State	1951	1961	1972	1982	1987
1. Arunachal Pradesh	NA	NA	174	168	312
2. Assam	5145	6489	5796	6750	7277
3. Himachal Pradesh	1115	1213	2176	2174	2245
4. Jammu & Kashmir	1321	1840	2057	2325	2766
5. Manipur	144	293	294	747	770
6. Meghalaya	NA	NA	468	550	586
7. Mizoram	NA	NA	25	49	50
8. Nagaland	NA	NA	89	151	203
9. Sikkim	NA	NA	NA	173	183
10. Tripura	191	495	525	680	828
11. Uttar Pradesh	23513	26283	26217	26152	26383
12. West Bengal	11106	11476	11878	15658	20311



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