

Japan International Cooperation Agency (JICA)

Forest Department

The State of Uttarakhand, India

**The Preparatory Survey
for
Uttarakhand Forest Resource
Management Project
in India**

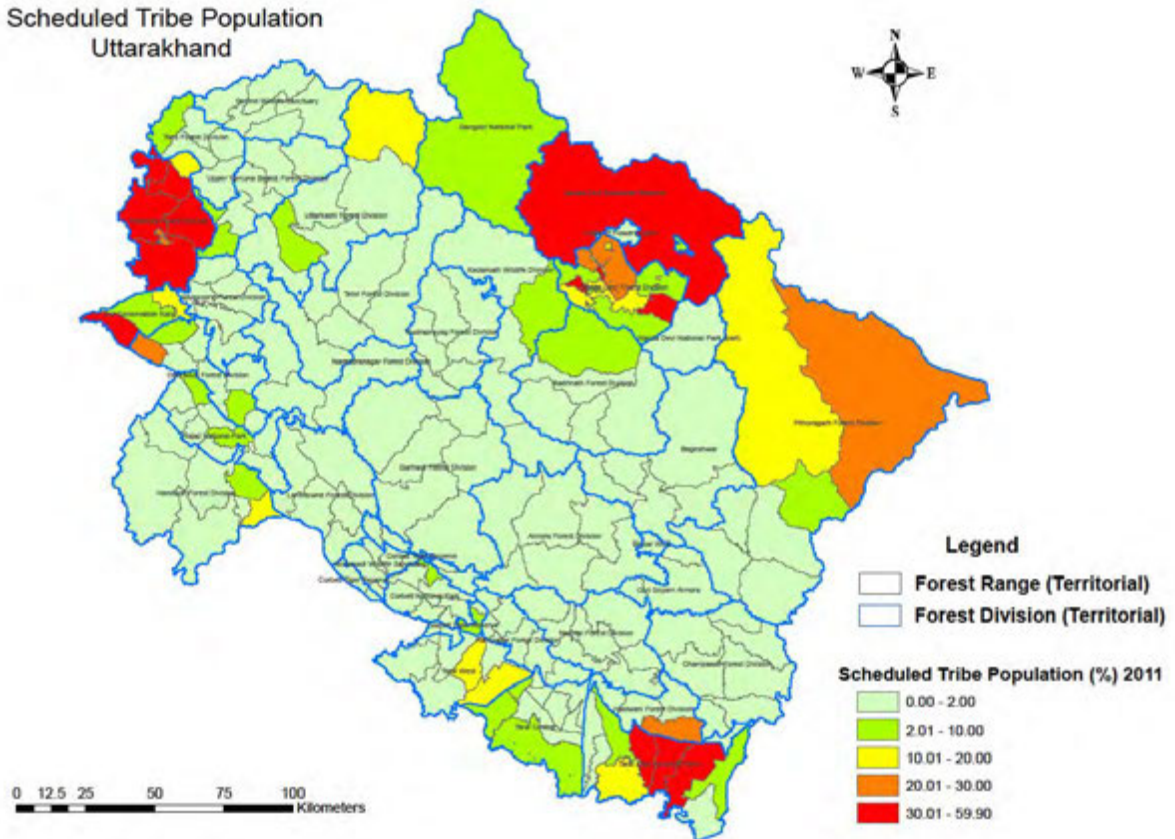
**Final Report
Volume I: Main Text**

February 2014

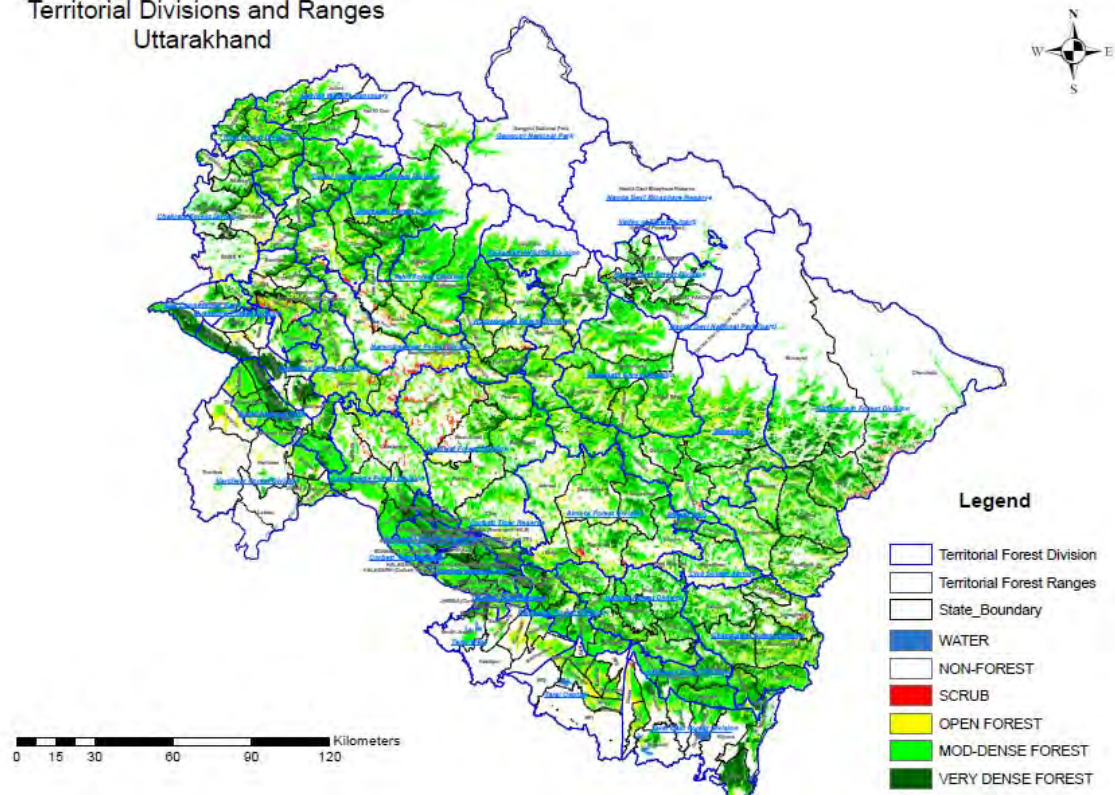
NIPPON KOEI CO., LTD.



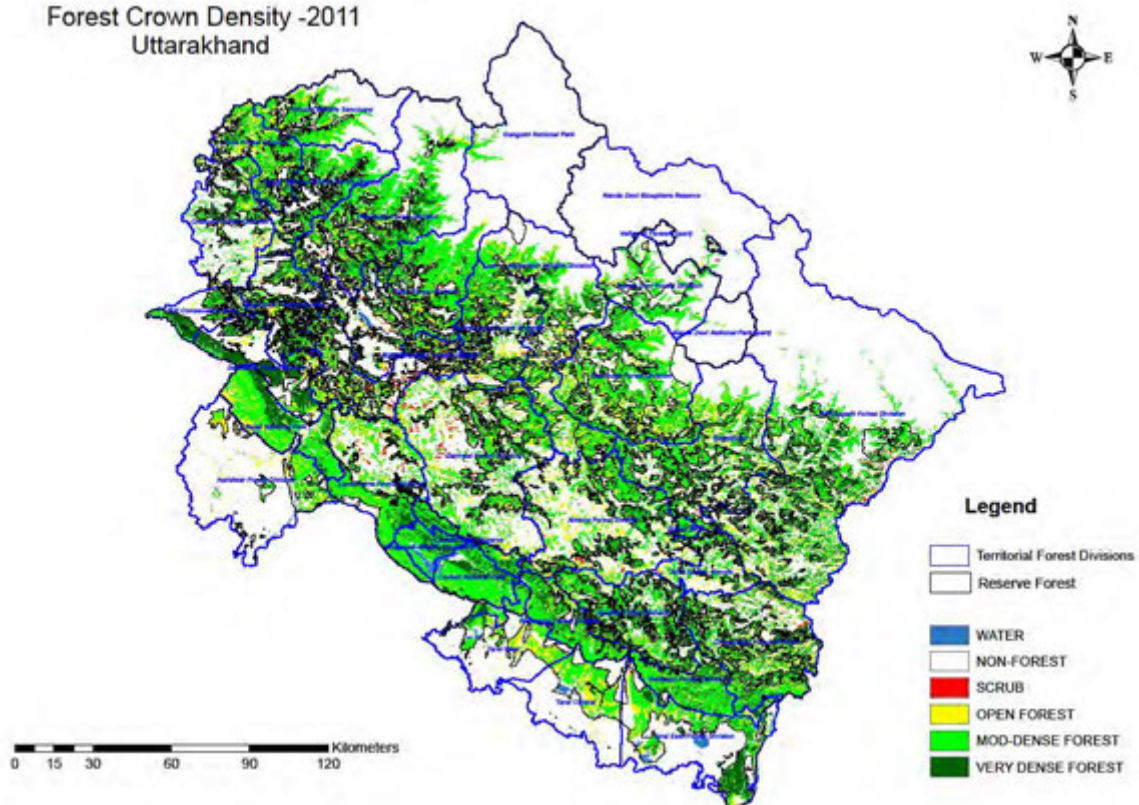
Scheduled Tribe Population Uttarakhand



Territorial Divisions and Ranges Uttarakhand



Forest Crown Density -2011 Uttarakhand



PHOTOS



Typical degraded Van Panchayat (village forest) on south aspect, which would be targeted by the project.



Degraded forest on north aspect with certain root stock, the vegetation of which can be regenerated with protection and certain silvicultural operations



Typical mountain road in the hilly areas, which is vulnerable to disasters



A typical nursery managed by UKFD located at a village. Villagers are engaged for the nursery operations, and many of them are VP members.



Villagers collect fallen pine needles regularly. They create beds for their cattle, which will be used as fertilizer later on.



Resin tapping at a pine tree



A processing facility for resin. The condition would be improved.



The warehouses of government for NTFP require better management



Private entrepreneurs can be good partners of the project for NTFP value addition and marketing



A number of dairy cooperatives are coming up in the State and getting momentum for expansion



An outlet of a dairy cooperative in a small town in the hilly areas in the State



Information collections and exchange of views and ideas at a remote village by the JICA Survey Team with VP members and forest officials

Final Report for the Preparatory Survey
for Uttarakhand Forest Resource Management Project
in India

Table of Contents

Volume I: Main Text

Page	
Location Map	
List of Acronyms	
Chapter 1 INTRODUCTION.....	1-1
1.1 Background of Preparatory Survey	1-1
1.2 Objectives of Survey	1-1
1.3 Survey Team and Schedule	1-1
Chapter 2 STATE OF UTTARAKHAND.....	2-1
2.1 Uttarakhand – An Overview	2-1
2.2 General Condition in Uttarakhand.....	2-2
2.2.1 Topography	2-2
2.2.2 Geology	2-3
2.2.3 Climatic Feature.....	2-4
2.2.4 Forestland.....	2-4
2.2.5 Socio-economic Profile.....	2-5
2.3 State Administration.....	2-9
2.3.1 State Administrative Structure	2-9
2.3.2 Administrative Divisions	2-9
2.3.3 Key Relevant Agencies.....	2-10
2.3.4 Fiscal Condition	2-12
2.4 Relevant Policies on Natural Resources and Climate Change	2-13
2.5 Legal and Policy Framework for Environmental and Social Considerations in India and Uttarakhand	2-17
2.6 Development Plans and Projects	2-20
2.6.1 National and State Five – Year Plans 2012 – 2017.....	2-20
2.6.2 Other Key Development Plans.....	2-21
2.7 Development Projects.....	2-21
2.8 Climate Change Trends and Impacts in Uttarakhand.....	2-24
2.9 Natural Disaster in Uttarakhand	2-26
Chapter 3 PROJECT AREA	3-1
3.1 Target Project Areas	3-1
3.2 Forests and Forestland.....	3-3
3.2.1 Forest Cover, Forest Type, Eco-Climatic Zones and Present Land Use.....	3-3
3.2.2 Forest Species and NTFPs	3-3
3.2.3 Utilization of Forest Resources/ Forest Dependency by Forest Dwellers.....	3-4
3.3 Forest Administration and Capacity	3-5
3.3.1 Overview and Structure of Forest Department and its Affiliates.....	3-5

3.3.2	Forest Administration and Management per Various Forestland Classifications and Functions	3-6
3.3.3	Staff Strength of UKFD	3-7
3.3.4	Existing Facility and Equipment	3-8
3.3.5	Budget of UKFD	3-10
3.4	Forest Management Practices	3-11
3.4.1	Overview of Forest Management in Uttarakhand	3-11
3.4.2	Participatory Forest Management/ Van Panchayat/Community Forestry	3-12
3.4.3	Working Plans, Working Schemes & Composite Management Plans	3-14
3.4.4	Current Mechanism of Project Implementation, Monitoring and Evaluation	3-16
3.4.5	Research and Training	3-18
3.4.6	Soil and Moisture Conservation Works	3-22
3.5	Forest Produce and Marketing	3-24
3.5.1	Timber Production	3-24
3.5.2	NTFP Promotion and Marketing Mechanism	3-24
3.5.3	List of existing facilities and CFCs	3-28
3.5.4	List of Key Industries and Entrepreneurs	3-29
3.6	Socio-economic Profile	3-29
3.6.1	Demographic Statistics	3-29
3.7	Livelihood	3-30
3.7.1	Agriculture, Livestock and Horticulture	3-30
3.7.2	Handicrafts and Services	3-34
3.7.3	Ecotourism	3-35
3.7.4	List of Existing Facilities and CFC	3-36
3.7.5	Existing Key Enterprises and Entrepreneurs and Livelihood	3-37
3.7.6	SHGs and JLGs	3-37
3.8	Community Development	3-40
3.8.1	Institutional Mechanism for BHN Support and Promotion of Renewable Energy	3-40
3.8.2	Institutional Mechanism for Basic Community Infrastructure Development	3-40
3.8.3	EPAs of Other Projects	3-41
3.9	Local NGOs	3-42
3.10	Protected Areas, Wildlife and Biodiversity and Community-level Institutions	3-43
3.11	Recent Natural Disaster	3-46
3.11.1	Outline	3-46
3.11.2	Disaster Scale	3-46
3.11.3	Road Damages	3-47
3.11.4	Damages in Forestry Sector	3-48
Chapter 4 STAKEHOLDER CONSULTATION		4-1
Chapter 5 KEY ISSUES		5-1
5.1	Major Causes of Forest Resource Degradation and Present Threats to Forests	5-1
5.2	Issues of Natural Resource Management Policies and Administration	5-2
5.3	Issue of Van Panchayat, Incentive Generation and Other Forest Management Practices	5-4
5.3.1	Governance and Performance Issues and Challenges before Van Panchayats	5-4
5.3.2	Community Participation & Van Panchayat Involvement in Government Funded Projects	5-6
5.3.3	Composite Management Plan & Micro Plan	5-6
5.3.4	Strategies for Strengthening Van Panchayats	5-7
5.3.5	Issues of Joint Forest Management and Village Forest Committee	5-8
5.4	Issues of Current Practices of Project Operations and M&E	5-8

5.4.1	National Afforestation Program (NAP) and Compensatory Afforestation Fund Management and Planning Authority (CAMPA)	5-9
5.4.2	Watershed Management Directorate (WMD)	5-9
5.5	Major Issues on Conservation of Wildlife, Biodiversity and Ecotourism	5-10
5.5.1	Wetlands	5-10
5.5.2	Sacred Groves	5-10
5.5.3	Biodiversity Management Committees (BMCs) & People Biodiversity Registers (PBRs)	5-10
5.6	Analysis on the Capacity of Executing Agency, Other Stakeholders and Local NGOs and their Coordination	5-11
5.6.1	Executing Agency	5-11
5.6.2	Panchayat Raj Institution (PRIs)	5-12
5.6.3	Local NGOs	5-12
5.7	Issues in NTFP policies, enterprise and marketing	5-12
5.7.1	Lack of adequate information on production and potential of NTFPs	5-12
5.7.2	Conservation, resource augmentation and management of the resource	5-12
5.7.3	Institutions	5-13
5.7.4	Marketing	5-13
5.7.5	Enterprise	5-14
5.8	Bottlenecks in Livelihoods Improvement and Community Development - Key Lessons Learned from Relevant Projects and Programs	5-14
5.8.1	Bottlenecks associated with Entry Point Activities (EPAs) and Convergence	5-14
5.8.2	Bottlenecks in Promoting Income Generation Activities	5-15
5.8.3	Women's Drudgery and Limited Opportunities for Livelihood	5-15
5.9	Japanese Technologies and International Marketing Opportunities	5-16
5.9.1	KANPO-YAKU - Japanese Herbal Medicine – Market	5-16
5.9.2	Aromatic Plants Products – Market	5-17
5.9.3	Opportunities	5-17
5.10	Issues on Safeguard Policies and Practices	5-17
5.10.1	Institutional Framework for Implementing and Monitoring Environmental Safeguards	5-17
5.10.2	Institutional Capacity for Implementing and Monitoring Social Safeguards	5-18
5.10.3	Key Challenges Associated with Particular Vulnerable Groups	5-19
 Chapter 6 ANALYSIS OF PROPOSED PROJECT (DPR) AND RECOMMENDATIONS		
6.1	Overview of Proposed Project	6-1
6.2	Project Needs and Rationale	6-4
6.3	Basic Project Approach and Objectives	6-6
6.4	Target Areas and Beneficiaries	6-7
6.5	Analysis on Proposed Eco-Restoration Component and Activities	6-9
6.5.1	Policy Initiatives	6-9
6.5.2	Selection of Project Sites	6-10
6.5.3	Demarcation of Intervention Area and Micro planning	6-12
6.5.4	Rehabilitation of Degraded Forests	6-16
6.5.5	NTFP Plantation	6-28
6.5.6	Biodiversity Conservation and Wildlife Management	6-30
6.6	Analysis on Proposed Livelihood Improvement and Community Development Component and Activities	6-34
6.6.1	Entry Point Activities and Livelihood Improvement through Convergence	6-34
6.6.2	Mechanism of SHGs, Supports and Operations	6-37

6.6.3	NTFP-Based IGA.....	6-43
6.6.4	Ecotourism	6-49
6.6.5	Non-NTFP Based IGA.....	6-51
6.7	Analysis on Proposed Other Support Activity	6-54
6.7.1	Capacity Building of Executing Body and Other Concerned Agencies and NGOs	6-54
6.7.2	Improvement of Infrastructure, Equipment and Mobility of Executing Bodies	6-55
6.7.3	Capacity Building of Van Panchayat and Other Community Based Institutions...	6-58
6.7.4	M&E and OVIs	6-60
6.7.5	Applied Forest Research and Publicity	6-70
6.7.6	Project Continuity Strategy	6-71
6.8	Component 4: Erosion Control and Sediment Disaster Mitigation	6-72
6.8.1	Background	6-72
6.8.2	Recommendations on Project Areas and Further Study.....	6-73
6.8.3	Overall Procedures of Planning and Designing for Sediment Disaster Mitigation Measures	6-73
6.8.4	Preliminary Recommendations on Overall Project Activities	6-76
6.8.5	Samples of Project Works for Sediment Disaster Mitigation	6-77
6.9	Component 5: Consulting Services	6-89
Chapter 7	ENVIRONMENTAL AND SOCIAL CONSIDERATIONS	7-1
7.1	Scheduled Tribes and Transhumants in Uttarakhand	7-1
7.2	Scheduled Tribes and Transhumants in the Project Area	7-2
7.2.1	Scheduled Tribes	7-2
7.2.2	Transhumants	7-5
7.2.3	Definitions and Interpretations.....	7-7
7.2.4	Project Categorisation and Treatment	7-8
7.3	Existing Environmental and Social Management Systems	7-10
7.3.1	Environmental and Forest Clearance Procedures in India	7-10
7.3.2	Environmental and Social Management Systems of the Executing Agency	7-11
7.4	Recommended Draft ESMF Summary	7-11
7.4.1	ESMF Target Groups	7-11
7.4.2	Objectives of the ESMF	7-12
7.4.3	Positive Environmental and Social Impacts of UFRMP	7-13
7.5	Recommended Draft Scheduled Tribes and Transhumants Planning Framework Summary	7-13
7.5.1	Objectives of the STTPF.....	7-13
7.5.2	Positive Environmental and Social Impacts	7-13
7.5.3	Potential Adverse Environmental and Social Impacts	7-13
7.6	Social Assessment Report	7-14
7.7	Recommended Procedures and Institutional Arrangements for Environmental and Social Considerations in UFRMP	7-15
7.8	Capacity Development Requirements	7-16
7.9	Safeguard Monitoring.....	7-17
Chapter 8	RECOMMENDATIONS ON PROCUREMENT AND IMPLEMENTATION METHOD	8-1
8.1	Overview	8-1
8.2	Proponent – Executor & Owner – Contractor	8-1
Chapter 9	ANALYSIS OF PROPOSED INSTITUTIONAL FRAMEWORK AND RECOMMENDATIONS	9-1

9.1	Executing Body, Implementation Mechanism and Staff Augmentation	9-1
9.2	Key Managerial Features of Institutional Arrangement	9-2
9.2.1	Budgetary Provision.....	9-2
9.2.2	Accounting Procedures	9-2
9.3	Details of Components of Institutional Setup for Project Implementation	9-3
9.3.1	High Powered Committee (HPC).....	9-3
9.3.2	Implementing Body.....	9-4
9.3.3	Other Implementing Units.....	9-10
Chapter 10 DETAILED IMPLMENTATION SCHEDULE		10-1
Chapter 11 PROJECT COST.....		11-1
11.1	Summary of Cost Estimate	11-1
11.2	Conditions and Assumptions	11-1
11.3	Cost Component	11-2
11.3.1	Cost per Project Component (Direct Cost)	11-2
11.3.2	Project Consultants	11-3
11.3.3	Administration Costs.....	11-3
11.4	Annual Cost Schedule	11-3
11.5	Financial Plan	11-4
Chapter 12 OPERATION AND MAINTENANCE		12-1
Chapter 13 PROJECT EVALUATION		13-1
13.1	Expected Economic Benefits.....	13-1
13.2	Basic Assumption for Cost-Benefit Analysis	13-1
13.3	Calculation of EIRR	13-2
13.4	Sensitivity Analysis	13-2
13.5	Employment Opportunities	13-2
13.6	Estimation of GHG Removal by Carbon Sink	13-3

List of Tables

Table 1.3.1	Summary of the Assignment Schedule of the Survey Team Members.....	1-1
Table 2.1.1	An Overview of Uttarakhand.....	2-1
Table 2.2.1	Classification of Forestland according to Management and Control.....	2-4
Table 2.2.2	Demographic Statistics	2-5
Table 2.2.3	Sector wise GSDP at Current Prices (Unit: INR 100,000)	2-6
Table 2.2.4	Category- Wise Labor Force (2001)	2-7
Table 2.3.1	List of Divisions and Districts in Uttarakhand.....	2-10
Table 2.3.2	Key Agencies of the State of Uttarakhand.....	2-10
Table 2.3.3	Uttarakhand State Budget at a Glance (INR million)	2-12
Table 2.3.4	Fiscal Indicator (% of GSDP)	2-13
Table 2.4.1	Relevant Policies.....	2-14
Table 2.5.1	National and State Level Legal and Regulatory Framework for Environmental and Social Safeguards.....	2-17
Table 2.6.1	National Growth Figures.....	2-20
Table 2.6.2	Budgetary allocations for National 12th five year plan	2-19
Table 2.7.1	Key Projects and programs in Uttarakhand (Externally Funded)	2-21
Table 2.7.2	Key Programs and Schemes in Uttarakhand (funded by State and Central Government)	2-22
Table 2.7.3	Forestry / Watershed Development Projects in Uttarakhand.....	2-23
Table 2.7.4	An overview of the Uttar Pradesh Forestry Project funded by the World Bank....	2-24
Table 3.1.1	Selected Project Divisions.....	3-2
Table 3.2.1	Major tree species in Uttarakhand.....	3-4
Table 3.2.2	Bamboo, Fiber and MAP species in Uttarakhand	3-4
Table 3.3.1	Forestland Classification and Description/ Management.....	3-6
Table 3.3.2	Type of Division and Jurisdiction.....	3-7
Table 3.3.3	Number of sanctioned Posts and in position under different Cadre.....	3-8
Table 3.3.4	Hardware of GIS Laboratory of UKFD	3-9
Table 3.3.5	Data Layers Available at GIS Laboratory of UKFD.....	3-10
Table 3.3.6	Forest Department Budget at a Glance (INR millions).....	3-10
Table 3.3.7	Outlay, Budget provision, Sanctioned amount and Expenditure of UKFD - FY 2011-2012 (in INR millions).....	3-10
Table 3.4.1	Distribution of VPs based on area.....	3-13
Table 3.4.2	JFM committees constituted under World Bank forestry project in Uttarakhand	3-13
Table 3.4.3	Year-wise formation of VFCs under World Bank Forestry Project in Uttarakhand	3-14
Table 3.4.4	Key agencies working in forests of the State of Uttarakhand.....	3-16
Table 3.4.5	Training Achievement at FTA, Haldwani (FY 2012-13).....	3-20
Table 3.4.6	Contents of the Training Programmes for Range Officer, Forester and Forest Guard (FTA, Haldwani).....	3-20
Table 3.4.7	Training Contents of Van Panchayat Training Program conducted at FTA	3-21
Table 3.5.1	District-wise Production of Timber in Uttarakhand.....	3-24
Table 3.5.2	List of facilities for processing of NTFPs in the state.....	3-28
Table 3.6.1	Demography of Priority 37 Ranges under the Project	3-29
Table 3.6.2	Demography of Target Divisions for Erosion Control and Sediment Disaster Mitigation Component	3-30
Table 3.7.1	Farming System by Agro Ecological Zone.....	3-31
Table 3.7.2	Trend in Egg and Poultry Meat production in Uttarakhand.....	3-32
Table 3.7.3	Trends in Whole Sale Price of Milk and Dairy Products in India.....	3-32
Table 3.7.4	Trends in Production, Per Capita Milk availability and Value of Outputs in Uttarakhand.....	3-32
Table 3.7.5	Production of Garlic in India and Wholesale Market Price in Uttarakhand	3-33

Table 3.7.6	Production of Ginger in India and Wholesale Market Price in Uttarakhand	3-34
Table 3.7.7	Production of Cauliflower in India and Wholesale price in Uttarakhand	3-34
Table 3.7.8	Tourist Visits in Uttarakhand	3-35
Table 3.7.9	List of Existing Facilities and CFCs	3-36
Table 3.7.10	Comparison of JLGs and SHGs	3-38
Table 3.7.11	Some information on SHGs and bank linkages in Uttarakhand	3-38
Table 3.7.12	Status of JLGs in Uttarakhand	3-39
Table 3.8.1	Entry Point Activities of Other Projects	3-41
Table 3.9.1	Involvement of NGOs in other Projects	3-42
Table 3.10.1	Major Protected Area (PA) in Uttarakhand	3-43
Table 3.10.2	District-wise Wetland in Uttarakhand	3-44
Table 3.10.3	Summary of Exiting/ Identified Sacred Grove in Uttarakhand	3-45
Table 3.10.4	Status of PBR Preparation	3-46
Table 3.11.1	Condition of Damage	3-46
Table 3.11.2	Summary of Damage to BRO, National and State Road Infrastructure	3-47
Table 3.11.3	Summary of District-Wise Damage to Other Road Infrastructure	3-48
Table 3.11.4	Damages Incurred to the Forest Infrastructure	3-48
Table 4.1.1	UFRMP Preparatory Survey Stakeholder Consultation Workshop Overview	4-1
Table 4.1.2	Summary of the Points Discussed at the Stakeholder Consultation Workshop (9th October 2013, Dehradun)	4-1
Table 5.3.1	An Overview of Van Panchayats	5-4
Table 5.3.2	Distribution of VPs based on area	5-5
Table 5.10.1	Key Challenges Associated with Vulnerable Groups	5-19
Table 6.1.1	Summary of Proposed Project	6-2
Table 6.1.2	Budget Proposal as per DPR	6-3
Table 6.1.3	Budget Proposal by JICA Survey Team	6-3
Table 6.4.1	Selected Priority Forest Ranges	6-7
Table 6.4.2	Forest Area and Forest Types in the Priority Ranges	6-8
Table 6.5.1	Proposed Three Eco-Restoration Models	6-17
Table 6.5.2	Selection Criteria for Eco-Restoration Model	6-17
Table 6.5.3	Estimated Requirement of Seedlings and Seeds	6-22
Table 6.5.4	Summary of the Existing Nurseries in the Priority Ranges and Estimated Production Capacity of Seedlings	6-23
Table 6.5.5	Identified Seed Sources of Various Species in the Hill Regions of Uttarakhand	6-25
Table 6.5.6	Plantation of NTFP Species	6-27
Table 6.5.7	Key Activities for Biodiversity Conservation	6-29
Table 6.5.8	Site Selection Criteria for Biodiversity Conservation and Wildlife Management	6-32
Table 6.6.1	Roles of Stakeholders in implementation of EPAs	6-34
Table 6.6.2	Salient Features of VP Office Building cum Disaster Relief Center	6-35
Table 6.6.3	Preliminary SHG selection and member priority criteria	6-37
Table 6.6.4	Proposed NGO Deployment Plan	6-40
Table 6.6.5	Key NTFPs to be focused by the Project	6-43
Table 6.6.6	Proposal of UKFD on Ecotourism Development	6-48
Table 6.6.7	Role of different Institutions for community based ecotourism activities	6-50
Table 6.6.8	Indicative number of SHGs for potential IGAs	6-51
Table 6.7.1	Key areas of Training for Personnel at the Executing Agencies	6-54
Table 6.7.2	Proposed Vehicles to be procured for PMU and DMU	6-55
Table 6.7.3	Proposed List of Equipment and Furniture	6-56
Table 6.7.4	Suggested List of Equipment to be procured by the Project for GIS Laboratory	6-56
Table 6.7.5	Table Preliminary Training Contents for Van Panchayats	6-57
Table 6.7.6	Preliminary Training Contents for SHGs	6-58
Table 6.7.7	Reporting requirement at various level	6-60
Table 6.7.8	Monitoring Frequency and Groups Involved	6-62
Table 6.7.9	List of Suggested Satellite Images to be Procured under the Project	6-65
Table 6.7.10	Suggested Operation and Effect Indicators	6-67
Table 6.7.11	Suggested Applied Forest Research Topics	6-69

Table 6.7.12	Suggested Activities for Applied Research and Publicity under the Project	6-70
Table 6.8.1	Main Surveys Required.....	6-76
Table 6.9.1	Summary of Recommendation on Consultancy Services	6-88
Table 7.1.1	Scheduled Tribe Populations in Uttarakhand.....	7-1
Table 7.1.2	Scheduled Tribes in Uttarakhand.....	7-2
Table 7.2.1	Scheduled Tribes in the Project Area - Indicative.....	7-3
Table 7.2.2	Van Gujjars Population	7-5
Table 7.4.1	ESMF Target Groups	7-12
Table 7.4.2	Potential Positive Environmental and Social Impacts of UFRMP.....	7-13
Table 7.6.1	Consultation and Participation in Social Assessment and Micro planning.....	7-14
Table 7.7.1	Overview of Procedures and Institutional Arrangements	7-15
Table 7.8.1	Knowledge and Skills Requirements for Participatory Forest Management and Environmental/Social Safeguards	7-16
Table 7.9.1	Output and Process Indicators for Safeguards Monitoring and Evaluation	7-17
Table 8.2.1	Project Proponent, Owner, Executor and Modus Operandi	8-1
Table 9.3.1	Composition of High Powered Committee	9-3
Table 9.3.2	Composition of Governing Body	9-4
Table 9.3.3	Composition of Executive Body	9-5
Table 9.3.4	Composition of Project Management Unit (PMU)	9-6
Table 9.3.5	Composition of Divisional Management Unit (DMU)	9-7
Table 9.3.6	Composition of Field Management Unit (FMU)	9-8
Table 9.3.7	Composition of District Advisory Committee (DAC)	9-9
Table 10.1.1	Time Bound Action Plan	10-2
Table 11.1.1	Summary of Cost Estimate	11-1
Table 11.3.1	Cost Components	11-2
Table 11.3.2	Project Component-Wise Cost Ratio	11-2
Table 11.3.3	Cost for Consulting Service	11-3
Table 11.4.1	Annual Cost Schedule.....	11-3
Table 11.5.1	Summary of Fund Requirement.....	11-4
Table 12.1	Operation and Maintenance Framework	12-1
Table 13.1.1	Anticipated Economic Benefits of UKFRMP.....	13-1
Table 13.2.1	Summary of the Conditions considered for Calculation of EIRR.....	13-2
Table 13.3.1	Results of Economic Analysis	13-2
Table 13.3.2	Summary of Expected Benefit from Project Activities.....	13-2
Table 13.4.1	Sensitivity Analysis by EIRR.....	13-2
Table 13.5.1	Base Cost of Project (category-wise).....	13-3

List of Figures

Figure 2.2.1	Geology of India and Uttarakhand	2-3
Figure 2.2.2	Employment by Sectors in Uttarakhand	2-7
Figure 2.3.1	State Administrative Structure	2-9
Figure 2.9.1	Flood and Landslide Hazard Map of Uttarakhand.....	2-27
Figure 3.3.1	Structure of Forest Department and its Affiliates	3-5
Figure 3.4.1	Sample Drawings and Design of the Soil and Moisture Conservation Works prepared by Raniket SC Division	3-23
Figure 3.4.2	Site Photograph of the Soil and Moisture Conservation Structures in Aina Village	3-23
Figure 3.7.1	District Wise Horticulture Crop Production 2011-12	3-32
Figure 3.11.1	Shelter Damage Categories.....	3-47
Figure 6.5.1	Suggested Framework for Preparation of Cluster Level Micro Plan.....	6-13
Figure 6.5.2	Overall Work Schedule of a Community (Batch-Wise)	6-21
Figure 6.6.1	Support Mechanism for SHG.....	6-37
Figure 6.8.1	Sample Prevention Plan	6-74
Figure 6.8.2	Image of Holistic Approach	6-80
Figure 7.1.1	Geographical Distribution of STs in Uttarakhand.....	7-1

Figure 7.2.1	Major Routes of Transhumants in Uttarakhand	7-6
Figure 7.3.1	EIA Procedure	7-10
Figure 9.1.1	Organizational Setup for Project Implementation.....	9-1
Figure 10.1.1	Schedule for Field-Level Key Project Works	10-1

List of Acronyms

AAP	Annual Action Plan
ABS	Access and Benefit Sharing
ACF	Assistant Conservator of Forest
ACR	Annual Confidential Report
ADB	Asian Development Bank
ADPO	Assistant Divisional Project Officer
AEAJ	Aroma Environment Association of Japan
ASHA	Accelerated Social Health Activist
ANR	Assisted Natural Reforestation
AO	Accounts Officer
APCCF	Additional Principal Chief Conservator of Forest
APO	Annual Plan of Operation
ARPO	Assistant Range Project Officer
ASHA	Accelerated Social Health Activist
ATI	Appropriate Technology India
ATMA	Agriculture Technology Management Agency
BDU	Bhesaj Development Unit
BHN	Basic Human Needs
BHS	Biodiversity Heritage Sites
BMC	Biodiversity Management Committees
BPL	Below Poverty Line
BRO	Border Roads Organization
CA	Chartered Accountant
CAAA	Chartered Accounts and Audit Division
CAG	Chief Auditor General
CAMPA	Compensatory Afforestation Fund Managements and Planning Authority
CAP	Centre for Aromatic Plants
CBD	Convention on Biological Diversity
CBED	Community Based Economic Development Project
CBET	Community Based Ecotourism
CBFM	Community- Based Forest Management
CBO	Community Based Organization
CCF	Chief Conservator of Forest
CDFMPT	JICA Capacity Development for Forest Management and Personnel Training Project
CDO	Chief Development Officer
CECI	Canadian Center For International Studies and Cooperation
CEO	Chief Executive Officer
CER	Certified Emissions Reductions
CF	Conservator of Forest
CFC	Common Facility Center
CIDA	Canadian International Development Agency
CLM	Cluster Level Plan
CMA	Clonal Multiplication Area
CMP	Composite Management Plan
CO ₂	Carbon dioxide
CPD	Chief Project Director
CPPP	Community Private Public Partnership
CS	Civil & Soyam

CSS	Centrally Sponsored Scheme
DAC	District Advisory Committee
DASP	Diversified Agriculture Support Project
DCF	Deputy Conservator of Forest
DDMA	District Disaster Management Authority
DEM	Digital Elevation Model
DEOC	District Emergency Operation Centre
DFO	Divisional Forest Officer
DHFW	Department of Health and Family Welfare
DLR	Department of Land Resources
DM	District Magistrate
DMMC	Disaster Mitigation and Management Centre
DMU	District /Division Management Unit
DOA	Department of Agriculture
DOH	Department of Horticulture
DPD	Deputy Project Director
DPO	Divisional Project Officer
DPR	Detailed Project Report
DRC	Disaster Relief Center
DRD	Department of Rural Development
DRDA	District Rural Development Agency
DSA	Divisional Support Agency
DST	Department of Science and Technology
EA	Executing Agency
EARF	Environment Assessment and Resettlement Framework
EB	Executive Body
EDC	Eco-Development Committees
EIA	Environmental Impact Assessment
EIRR	Economic Internal Rate of Return
EPA	Entry Point Activities
ER	Eco-Restoration
ESA	Environmental and Social Assessment
ESMF	Environment Social Management Framework
FDA	Forest Development Agency
FDDF	Forest Dwellers Development Framework
FHH	Women and Female Headed Households
FI	Financial Intermediary
FLE	Field Level Expert
FMAS	Financial Management and Accounting System
FMU	Field Management Unit
FNGO	Field Non Government Organization
FRA	Forest Resources Assessments
FRDC	Forest and Rural Development Commissioner
FRI	Forest Research Institute
FSI	Forest Survey of India
FTA	Forest Training Academy
FY	Fiscal Year
GB	Governing Body
GDP	Gross Domestic Product
GEF	Global Environment Facility
GER	General Financial Rules

GIS	Geographic Information System
GMVN	Garhwal Mandal Vikas Nigam
GNDP	Gross National Domestic Product
GO	Government Order
GoI	Government of India
GOUK	Government of Uttarakhand
GP	Gram Panchayat
GPS	Global Positioning System
GRB	General Rules of Business
GSDP	Gross State Domestic Production
GSI	Geological Survey of India
HFL	Highest Flood Level
HKH	Hindu Kush Himalayas
HOD	Head of Forest Department
HPC	High Powered Committee
HQ	Head Quarter
HRDI	Herbal Research and Development Institute
ICIMOD	International Center for Integrated Mountain Development
IFAD	International fund For Agriculture Development
IPM	Integrated Pest Management
IPPF	Indigenous Peoples Planning Framework
ITBP	Indo-Tibetan Border Police
IGA	Income Generation Activities
ILSP	Integrated Livelihood Support Project
INR	Indian National Rupee
IPR	Intellectual Property Rights
ISFR	India State of Forest Report
ISRO	India, and Space Applications Centre
IWMP	Integrated Watershed Management Project
JETRO	Japan External Trade Organization
JFM	Joint Forest Management
JFMC	Joint Forest Management Committee
JICA	Japan International Cooperation Agency
JLG	Joint Liability Group
JPY	Japanese Yen
KMVN	Kumaon Mandal Vikas Nigam
KVIC	Khadi and Village Industries Commission
MAB	Man and Biosphere
MAP	Medical and Aromatic Plants
MDR	Main District Road
M&E	Monitoring and Evaluation
MFI	Micro Finance Institution
MHA	Ministry of Home Affairs
MIS	Management Information System
MNREGS	Mahatma Gandhi National Rural Employment Guarantee Scheme
MLA	Member of the Legislative Assembly
MoEF	Ministry of Environment and Forests
MOU	Memorandum of Understanding
MPCA	Medicinal Plant Conservation Area
NABARD	National Bank for Agriculture and Rural Development
NAP	National Afforestation Program

NAPCC	National Action Plan on Climate Change
NCE	NTFP Center for Excellence
NDM	National Disaster Management
NDMA	National Disaster Management Authority
NDRF	National Disaster Response Force
NFAP	National Forest Action Plan
NGO	Non Government Organization
NIDM	National Institute of Disaster Management
NMPB	National Medical Plants Board
NP	National Park
NPV	Net Present Value
NRHM	National Rural Health Mission
NRLM	National Rural Livelihood Mission
NRSC	National Remote Sensing Centre
NSDP	Net State Domestic Product
NTFP	Non-timber Forest Products
NWIA	National Wetland Inventory and Assessment
ODR	Other District Road
OSD	Officer on Special Duty
OST	Overseas Study Tour
OSV	Off Season Vegetable
OVI	Objectively Verifiable Indicators
OWC	Overlapping Working Circle
PA	Protected Area
PBR	People's Biodiversity Register
PC	Program Coordinator
PCBSFTI-SFSC	JICA Project for Capacity Building of State Forest Training Institutions and SFS (State Forest Service) Colleges
PCCF	Principle Chief Conservator of Forest
PFM	Public Financial Management
PMC	Project Management Consultant
PME	Participatory Monitoring and Evaluation
PMGSY	Pradhan Mantri Gram Sadak Yojana (Providing all weather road connectivity)
PMU	Project Management Unit
PNGO	Partner Non Government Organization
PRA	Participatory Rural Appraisal
PRI	Panchayati Raj Institution
PRT	Wildlife Primary Reaction Team
PTG	Primitive Tribal Group
PWD	Public Works Department
QRT	Wildlife Quick Response Team
RCC	Roller Compacted Concrete
RD	Revenue Department
R&D	Research and Development
RE	Renewable Energy
REDD+	Reducing Emissions from Deforestation and Forest Degradation
RF	Reserved Forest
RKVY	Rashtriya Krishi Vikas Yojna (National Agriculture Development Plan)
RO	Range Officer
RPO	Range Project Officer
RTI	Right to Information Act

SA	Social Assessment
SAPCC	State Action Plan on Climate Change
SBB	State Biodiversity Board
SC	Scheduled Caste
SDMA	State Disaster Management Authority
SDMD	State Disaster Management Department
SEOC	State Emergency Operation Centre
SFDA	State Forest Development Agency
SHG	Self Help Group
SGSY	Swarnjayanti Gram Swarozgar Yojna
SLBC	State Level Bankers Committee
SLEM	Sustainable Land and Ecosystem Management Project
SMC	Soil & Moisture Conservation
SMPB	State Medicinal Plants Board
SMS	Short Message Service
SO	Statistical Officer
SOE	Statement of Expenditure
SRTM	Shuttle Radar Topography Mission Data
SSPA	Seedling Seed Production Area
ST	Scheduled Tribe
STTPF	Scheduled Tribe and Transhumant Planning Framework
SWOT	Strengths, Weaknesses, Opportunities and Threats
TERI	The Energy and Resources Research Institute
TOT	Training of Trainers
ToR	Terms of Reference
TSG	Technical Support Group
TWD	Tribal Welfare Department
UAPCC	Uttarakhand State Action Plan on Climate Change
UBB	Uttarakhand Biodiversity Board
UBFDB	Uttarakhand Bamboo and Fiber Development Board
UBFRDP	Uttarakhand Bamboo Craft, Revitalization & Diversification Program for Livelihood & Ecological Restoration under Special component plan
UC	Utilization Certificate
UCAMPA	Uttarakhand Compensatory Afforestation Management and Planning Authority
UDWDP	Uttarakhand Diversified Watershed Development Project
UFDC	Uttaranchal Forest Development Cooperation
UFRMP	Uttarakhand Forest Resource Management Project
UGVS	Uttarakhand Gramya Vikas Samiti
UHHDC	Uttarakhand Handloom and Handicrafts Development Council
UKFD/FD	Uttarakhand Forest Department
UKFSR	Uttarakhand Forest Statistics Report
ULDB	Uttarakhand Livestock Development Board
UNDP	United Nation's Development Program
ULIPH	Uttarakhand Livelihood Project for Himalayas
UNDMT	United Nations Disaster Management Team
UNESCO	United Nations Educational Scientific and Cultural Organization
UNFCC	United National Framework Convention on Climate Change
UOCB	Uttarakhand Organic Commodity Board
UPASC	Uttarakhand Parvatiya Ajeevika Samvardhan Company
UPFM	Uttar Pradesh Participatory Forest Management and Poverty Alleviation Project

UPFS	Uttarakhand Finance Service
UPS	Uninterruptible Power Supply
UREDA	Uttarakhand Renewable Energy Development Agency
US Nagar	Udham Singh Nagar
USAC	Uttarakhand Space Application Centre
USD	United States Dollars
USPSP	Uttarakhand State Perspective and Strategic Plan
VAT	Value Added Tax
VFC	Village Forest Committee
VMG	Vegetative Multiplication Gardens
VP	Van Panchayat
VPEC	Van Panchayat Executive Committee
VPO	Van Panchayat Office
WB	World Bank
WC	Working Circle
WG	Working Group
WII	Wildlife Institute of India
WL	Wildlife
WMD	Watershed Management Directorate
WMO	World Meteorological Organization
WP	Working Plan
WSHG	Women Self Help Groups

Measurement Units

Extent	Weight
1 km ² = 100 ha	1 Quintal / qtl. = 100 kg
1 acres = 0.40468ha	
Number	Currency
Lakh = 100,000	Rs. = Indian Rupees (INR)
Crore = 10,000,000	JPY = Japanese Yen
	USD = \$ =United State Dollars

<p>Exchange Rate</p>

<p>Rs.1.0 = JPY 1.56 USD 1.0 = Rs.63.8 USD 1.0 = JPY 99.2</p>

<p>(As of October 2013)</p>

EXECUTIVE SUMMARY

Project Objective

To contribute to the eco-restoration, forest resource development, and the livelihoods improvement and income generation of the forest dependent households, while mitigating sediment disaster risks in highly vulnerable areas.

Necessity and Priority of the Project

According to the India State of Forest Report 2005 and 2011 by Forest Survey of India (FSI), in the State of Uttarakhand, approximately 150,000 ha of good forests have become degraded forests (Scrub, Open Forest and Moderately Dense Forest, as per the crown density classifications of FSI), while mere 300 ha of total forest cover increased in the State during the same time. This indicates that the quality of forest has deteriorated greatly, and the needs of Eco-Restoration interventions are considerably high.

The population in the rural areas of Uttarakhand has almost doubled in 30 years from 5.7 million in 1981 to 10.1 million in 2011. The local industries grow slowly, and the excess labor force of fragmented social groups (especially for the Scheduled Casts and Schedule Tribes) has not been absorbed adequately by the labor market. Low level of understanding and awareness of sustainable management of natural resources has been causing irregular and overexploitation of forest.

Uttarakhand has 12,089 Van Panchayats (VPs), managing 575,000 hectares of forests (including 14,000 hectare of Reserved Forest managed by VPs), which is 15.72% of total forest area of the state. It is, however, that many of Van Panchayat, as vital village-level institution, are still weak to manage their forests properly, but do not get enough support from the government due to the budgetary limitations. Out of 12,089 VPs, 7,322 VPs (61%) do not have a micro plan. Hence the needs are significant for the preparation of the plans with the participatory approach, as well as the capacity building to support the VPs and the Forestry Department of Uttarakhand for the successful formulation and execution of the Project.

The recent disaster occurred in June 2013 in the state was devastating, and the damages caused by the calamity were unparalleled in the history of the region. Over 6,000 people lost their lives or still missing, and more than 100,000 people lost their homes. Nearly 8,000 km of roads were destroyed, as well as other crucial lifelines and infrastructure, such as electricity networks, water facilities, public buildings, irrigations, telephone networks, etc., were put out of order.

In view of UKFD requires enhancements of technical expertise and field experiences in geotechnical countermeasures to such erosions, execution of appropriate mechanical and vegetative slope stabilization works, soil/debris retaining works, water flow control measures, etc. within the forest areas. There is a great need for capacity building for UKFD in the disaster management sector, as well as urgent rehabilitation and protection against landslides, slope failures, etc. caused by the recent disaster.

Rationale of Project Design

The project will be of 8 years duration, starting from 2014-15 to 2021-22 in consideration of capacities of stakeholders and time required to conduct activities in sustainable manners. The forest rehabilitation and growth of plants to be regenerated with the assistance of the project will be slow in the high altitude areas, and 8 years is appropriate. The project activities will be executed by the UKFD through the collaboration with other agencies for certain project components and activities. The main implementers will be the villager themselves in a form of village-level institutions as VP, and certain activities will be outsourced to specialized agencies.

Project Scope

The Project Components and Sub-Components of recommended project by the JICA Survey Team is summarized below:

■ **Component 1: Eco-Restoration**

- Sub-Component 1.1 Rehabilitation of Degraded Forest
- Sub-Component 1.2 NTFP Plantation
- Sub-Component 1.3 Biodiversity Conservation and Wildlife Management
- Sub-Component 1.4 Other Eco-Restoration Activities

■ **Component 2: Livelihood Improvement and Community Development**

- Sub-Component 2.1 Community Mobilizing and Micro planning
- Sub-Component 2.2 Entry Point Activities (EPA)/ Livelihood Improvement through Convergence
- Sub-Component 2.3 NTFP-Based IGA
- Sub-Component 2.4 Ecotourism
- Sub-Component 2.5 Non-NTFP Based IGA

■ **Component 3: Other Support Activities**

- Sub-Component 3.1 Preparatory Works (The establishment of Executing Bodies, recruitment of project staff members, preparation of various manuals and procedures, issuance of necessary administrative orders, organizing a series of orientations to the project staff members, procurement of PMC and other support organizations, selection of target sites, survey and mapping, preparation of Composite Management Plans and micro plans, preparation of Annual Plan, etc.)
- Sub-Component 3.2 Capacity Building of Executing Agencies and Other Stakeholders
- Sub-Component 3.3 Capacity Building of Village Level Institutions
- Sub-Component 3.4 Applied Research and Publicity
- Sub-Component 3.5 Monitoring and Evaluation (including baseline survey, MIS, GIS, periodical monitoring and evaluation, social auditing, etc.)
- Sub-Component 3.6 Project Continuity Strategy

■ **Component 4: Erosion Control and Sediment Disaster Mitigation**

■ **Component 5: Consulting Services (Project Management Consultants)**

Project Locations and Key Targets of Uttarakhand Forest Resource Management Project

Item	Description
Actual Locations	1. 1,000 Van Panchayat/ hamlets within 37 priority ranges in 13 Forest Divisions 6 Forest Divisions for Sediment Disaster Mitigation Measures
Key Targets	1. 50,000 ha of forest restoration and soil & moisture conservation (SMC) measures (ERM I: 30,000 ha, ERM II: 10,000 ha, ERM III: 10,000ha), the project impact area is estimated to be 192,500 ha. 2. Approximately 500 ha of NTFP plantation 3. Total 1.65 million plants to be planted (Note: The estimation assumes 10% of the mortality for ERM - II and III. The actual numbers are subject to change, in

	accordance with the actual forest conditions.)
4.	Sacred Grove Sustainable Management for 13 sites with PBRs, to be registered as Biodiversity Heritage Sites
5.	Revitalization of approximately 1,000 VPs and BMCs (1st Batch: 100 VPs, 2nd Batch: 350 VPs, 3rd Batch: 350 VPs, 4th Batch: 200 VPs)
6.	13 modern nurseries
7.	Income generating activities by 480 clusters and 13 SHG Federations with 2,000 SHGs
8.	Ecotourism development for 7 sites
9.	Establishment of 1 GIS Laboratory, construction of 1 PMU building, expansion of 13 DMU buildings, expansion of 37 FMU buildings
	Establishment of NTFP Centre of Excellence
10.	Capacity building of 20 PMU members, 52 DMU officers, 148 FMU officers, 263 FNGO Personnel, 1,000 Animators at the village level, 3,000 VP members and 6,000 SHG members
11.	Engagement of Project Management Consultants: International Consultants 75M/M, National Consultants 285M/M, Support Staff 555M/M)
12.	(The target for the sediment disaster mitigation is to be determined.)

Implementation Schedule

Items	Detail
Selection of Consultants	January 2014 - December 2014
Establishment of PMU	January 2014
Eco-Restoration Activities	June 2014 - March 2022
Livelihood Improvement and Community Development Activities	July 2015 - March 2022
Other supporting Activities	January 2014 - March 2022
Erosion Control and Sediment Disaster Mitigation Activities	January 2014 - March 2022
Consulting Services	February 2015 - September 2020 (approx. 5.5 years)
Project Completion Date	March 2022

Project Cost

The Project Cost was estimated by the JICA Survey Team. The summary of the project cost segregated by Foreign Currency and Local Currency is presented below. The Local Currency Portion has been converted into JPY at the conversion as shown below.

Project Cost segregated by Foreign Currency Portion and Local Currency Portion

Unit: Million JPY

Breakdown of Cost	Foreign Currency Portion (A)			Local Currency Portion (B)			Total (A)+(B)		
	JICA Portion	Others	Total	JICA Portion	Others	Total	JICA Portion	Others	Total
Eco-Restoration	0	0	0	6,675	0	6,675	6,675	0	6,675
Community Development and Livelihood Improvement	0	0	0	3,050	0	3,050	3,050	0	3,050
Other Supporting Activities	0	0	0	995	0	995	995	0	995
Erosion Control and Sediment	0	0	0	2,184	0	2,184	2,184	0	2,184

Breakdown of Cost	Foreign Currency Portion (A)			Local Currency Portion (B)			Total (A)+(B)		
	JICA Portion	Others	Total	JICA Portion	Others	Total	JICA Portion	Others	Total
Disaster Mitigation									
Price Escalation	0	0	0	883	0	883	883	0	883
Physical Contingency	0	0	0	690	0	690	690	0	690
Consulting Services	334	0	334	264	0	264	598	0	598
Administration Cost	0	0	0	0	2,248	2,248	0	2,248	2,248
VAT	0	0	0	0	189	189	0	189	189
Service Tax	0	41	41	0	225	225	0	266	266
Interest during construction	0	210	210	0	0	0	0	210	210
Front End Fee	0	30	30	0	0	0	0	30	30
Total	334	282	616	14,741	2,662	17,403	15,075	2,943	18,018

Source: JICA Preparatory Survey Team

(Note)

1. Exchange Rate: US\$1=INR 63.8 , US\$1=99.2 Japanese yen, INR1 = JPY 1.56
2. Price Escalation
 - (a) Foreign Currency Portion: 1.3 % per year
 - (b) Local Currency Portion: 3.1 % per year
3. Physical Contingency: 5.0%
4. Base Year for Cost Estimation: October 2013

Project Cost by Year

The total project cost has been broken into JICA loan eligible and non-eligible portion on an annual basis. The cost estimated in JPY has been converted into INR.

Annual Cost in JPY and INR

Fiscal Year	Breakdown of Cost (million JPY)			Breakdown of Cost (million INR)		
	JICA Portion	Non Eligible Portion	Total	JICA Portion	Non Eligible Portion	Total
2014	514	140	654	330	90	419
2015	1,630	439	2,069	1,045	281	1,326
2016	2,947	447	3,394	1,889	287	2,176
2017	4,000	459	4,458	2,564	294	2,858
2018	3,248	468	3,716	2,082	300	2,382
2019	1,663	473	2,136	1,066	303	1,369
2020	819	286	1,105	525	183	708
2021	254	233	486	163	149	312
Total	15,075	2,943	18,019	9,664	1,1887	11,550

Source: JICA Preparatory Survey Team

(Note) Rounded figures are used for the table.

Executing Agency

Executing Agency will be the Uttarakhand Forest Department (UKFD).

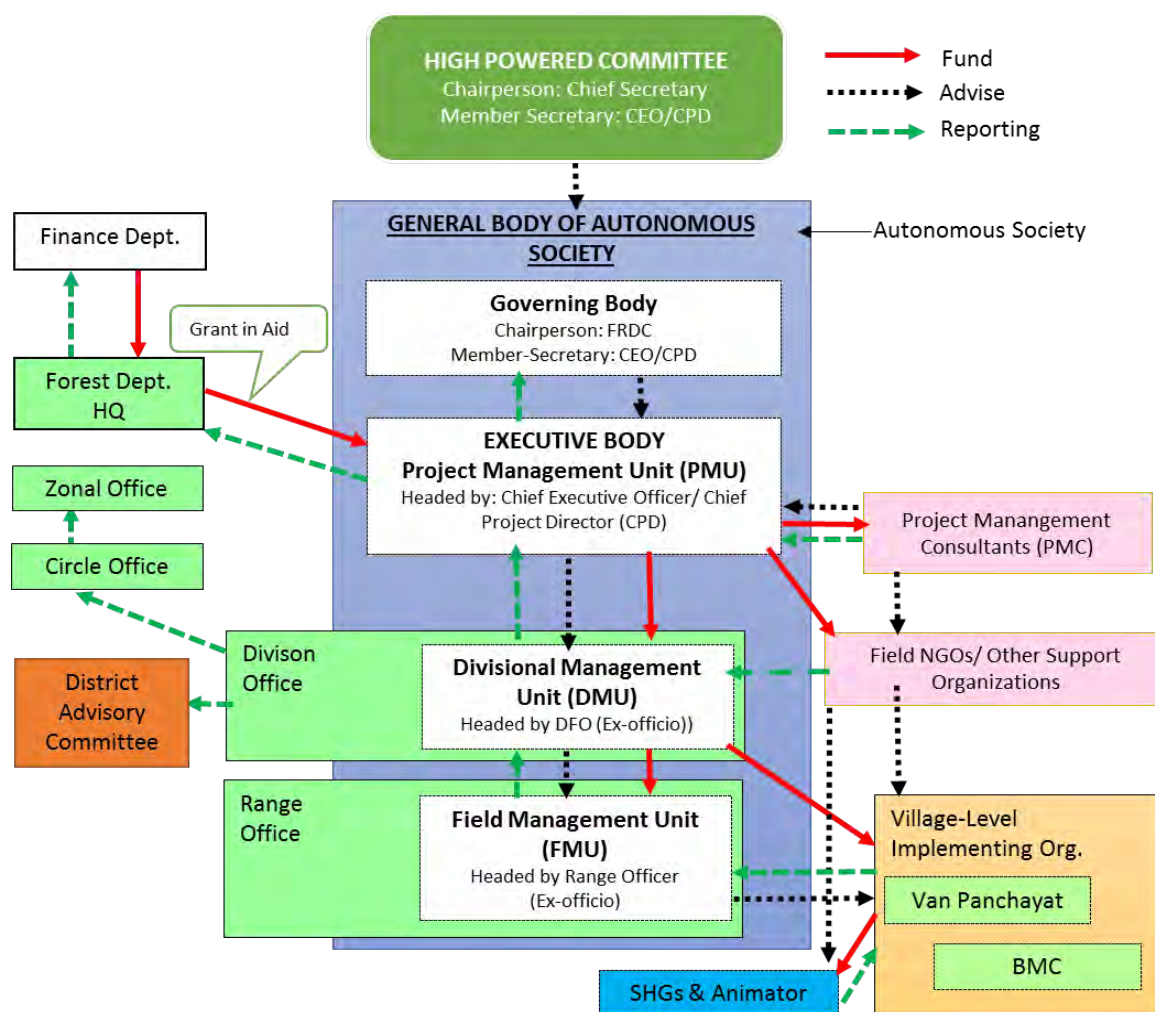
The Project will be implemented by the UKFD through Project Management Unit (PMU) as an autonomous Society. It would be overall responsible for management and implementation of the project. PMU would be supported by a team of experts constituting Project Management Consultants (PMC). All the officers in PMU would be either on deputation from the Forest Department or hired from open market.

DMUs would be headed by DMU Officer (Ex-officio DFO) responsible to implement and supervise field operations. DMUs would also have other positions and support staff to manage and implement project activities.

FMUs would be headed by FMU officer (Ex-officio Range Officer) and would be responsible for project implementation at Van Panchayat level. FMU would be supported by the Field NGOs particularly for community mobilization and social processes.

At the lowest level responsibility of planning, implementation, monitoring and reporting would be with the Van Panchayat's Management Committee. The Management Committee would be headed by Chairperson and members as specified in Van Panchayat Rules 2005, and would manage and implement the project activities following the Rules and project guidelines issued from time to time. Apart from the NGOs and FMU staff, VPs would be supported by Animator, who would be an educated person identified by community amongst themselves.

The overall organizational structure is shown below:



Procurement and Consultants

Type		Selection and Procurement Method
1	Contractors	<ul style="list-style-type: none"> - Major work will be implemented by the village level institutions (i.e., VP, BMC and SHG) through the MoU with UKFD - Other works will be implemented directly by the executing agency or other government agencies (e.g., State Biodiversity Board) through MoU - For large construction works, the work will be contracted to contractors through local competitive bidding
2	Technical Assistance	<ul style="list-style-type: none"> - Field NGOs would be selected through local competitive bidding and contracted by PMU. - Trainers and local consultants would be selected as resource persons/ organizations for capacity building activities and other technical assistance through advertisement or local competitive bidding.
3	Supplier(s)	Good would be procured through price quotation.
4	Consultant(s) -Project Management Consultant	International competitive bidding through the short-list method would be adopted for selecting Project Management Consultants.

Project Benefit

Components and Activities	Benefits
Component 1. Eco Restoration	Increased supply of fodder and fuel wood Increased production of NTFPs CO ₂ sequestration by afforestation
Component 2. Livelihood Improvement and Community Development	Income generated through enterprise development (NTFP and non-NTFP)
Component 3. Other Support Activities	(Only indirect benefits)
Component 4. Erosion Control and Sediment Disaster Mitigation	Reduced damages on agriculture crops, houses, human lives and infrastructures

20,915,493 person-days (or 697,183 person-months) of employment will be generated by the project.

Precautions

Delay in PMU formation and procurement of PMC will affect the implementation of the Project. Timely and adequate budget allocation should be made by the State Government, and a “corpus fund” may be created for this.

Also, the Composite Management Plan shall be prepared by February 2014, and the preparation of seedlings shall start no later than June 2014.

Environmental and Social Impacts

No land acquisition and resettlement will be necessary in the project, and neither preparation of an Environment Impact Assessment report nor obtaining an Environmental Clearance for the Project is necessary under the Notification of January 1994 by the Ministry of Environment and Forests.

Instead of Forest Dwellers Development Framework as per the JICA guideline for environmental and social considerations, Environmental and Social Management Framework and Scheduled Tribes and Transhumants Framework have been drafted by the JICA Survey Team. The drafts for environmental check list and Environmental and Social Management Check List have also been prepared by the JICA Survey Team.

Qualitative and Quantitative Data of Monitoring Indicators

Project Component	Operation Indicator	
	Indicator	Target
Eco-Restoration	Size of forests treated	50,000 ha (30,000 ha for model I, 10,000 ha for model II, 10,000 ha for model III)
	Size of NTFP plantation	500 ha
	No. of seedlings planted	15,050,000 plants (5,000,000 plants for model II, 10,000,000 plants for model III, 50,000 for NTFP)
	Lengths of fencing	5,550 km
	No. of PBRs prepared	13
	No. of modern nurseries developed	13
Livelihood Improvement and Community Development	Employment generation	20 Million person-day of work created
	Convergence	2,000 programs organized through convergence
	Revolving fund	INR 100 million revolving fund utilized by 2,000 SHGs
	No. of IGA clusters and federations	50 NTFP IGA clusters and 13 non-NTFP SHG federations developed
	Ecotourism site	7 community-based ecotourism sites are developed
	No. of micro plans	Maximum 1,000 micro plans/ cluster-based micro plans prepared and updated with proper GIS maps and safeguard frameworks
Other Support Activities	SHG	Creation or adoption of SHGs
	No. of village trainees	30,000 VP/ BMC members are trained
	No. of officer trainees	2,500 trainees from UKFD, NGOs and other concerned agencies participated
Erosion Control and Sediment Disaster Mitigation	Infrastructure development	1 PMU/NCE building, GIS/MIS laboratory, 13 DMU buildings and 37 FMU buildings are developed
	To be decided once the activities are defined.	To be decided once the activities are defined.
Project Component	Effect Indicator	
	Indicator	Target
Eco-Restoration	Survival rate	At least 60% overall at the end of project (at least 2 sample plots per VP)
	Crown density	Above 40% density in the 80% of treated areas after 20 years
	Revenue of UKFD	Royalty from NTFP increased by 5% in 37 target ranges
	Water regime	30% of villages observe clear evidence of improvement (interview survey)
	No. of sites registered	13 sites registered as Heritage Site or other conservation programs
Livelihood Improvement and Community Development	Additional income	Increase in household income as a result of project activities (target and survey methods will be determined during the baseline survey)
	NTFP enterprise	INR 50 million increasing in total annual trade volume of NTFP by the clusters supported by the project (target will be revisited during the project)
	Revenue of NCE	The total annual revenue/ program supports to NCE exceeds INR 2 million at the time of project completion
	Drudgery	Time for women to carry fuel wood and water is reduced by 20%
	Sustainability of ecotourism	7 community-based ecotourism sites became financially self-sustaining at the end of project
	IGA	No. of SHGs taking more than 2 rounds of loans from VP (Target will be determined during the project)

Project Component	Operation Indicator	
	Indicator	Target
Other Support Activities	Monitoring and evaluation	Regular external monitoring and evaluation are completed as per the plan, and the project is rated Satisfactory in all the 5 evaluation criteria
	Baseline survey, mapping, MIS	Necessary information for monitoring and evaluation became available with the project
	Research papers	At least 20 research papers were published in journals
Erosion Control and Sediment Disaster mitigation	To be decided once the activities are defined.	To be decided once the activities are defined.

Calculation of Economic Internal Rate of Return (EIRR)

Economic Index	Result
NPV (INR)	542,848,464
EIRR	10.1%

Monitoring Plan for the Indicators

Type	In Charge	User	Remarks
Annual Report	PMU	UKFD, HPC, GOU, GOI, JICA	<ul style="list-style-type: none"> Achievement (physical and finance) and status against the annual plan Performance indicators, Social and Environment Safe guards Problems and constraints Photographs, graphs etc. To be uploaded on web-site and kept in public domain
Quarterly Report	PMU	GB, HPC, GOU, JICA	<ul style="list-style-type: none"> achievement (physical and finance) and status against the annual plan Problems and constraints Photographs, graphs etc.
Monthly Reports	DMU	PMU, Zone, Circles	<ul style="list-style-type: none"> achievement (physical and finance) and status against the annual plan Problems and constraints Photographs, graphs etc.
Weekly Reports	FMU	DMU	<ul style="list-style-type: none"> achievement (physical and finance) and status against the annual plan Problems and constraints
Statement of Expenditure (SOE)	PMU	JICA/ CAAA	<ul style="list-style-type: none"> Financial Reporting against the annual plan consolidating expenses at VPs, FMUs, DMUs and PMU level The SOE to be prepared based on the entries made in the FMAS module
Annual Action Plan	PMU	PMU, DMUs, FMUs, GB	<ul style="list-style-type: none"> Planning activities as per Project implementation Plan, Plan for backlog/ delayed activities, and Strategy; this plan would incorporate the annual plans of VPs/ BMCs drawn out of the Micro-Plans
Field Visit Report	By visiting officers	All concerns	<ul style="list-style-type: none"> Identifying the issues and make observations on the project implementation progress vis-à-vis AAP

Operations and Maintenance (O&M)

Item	Operator
Rehabilitated forests	Van Panchayat
NTFP plantation	UKFD
Central nursery	UKFD
Wildlife response team and facility/ equipment	UKFD
VP office building cum disaster relief centre & furniture	VP
Other community infrastructure	Gram Panchayat and other concerned agencies
NTFP Centre of Excellence (NCE)	NCE (autonomous society)
Production centre	IGA clusters/ SHG federations/ cooperatives/ producers' companies
IGA revolving fund	NCE and VP
Ecotourism destination sites	VP
Office building and furniture	UKFD
Vehicle and equipment	UKFD
GIS laboratory	UKFD
MIS	UKFD
UKFD Research Wing	UKFD
Sediment disaster mitigation measures	UKFD
Emergency shelter	District government
Emergency kit	VP/ Gram Panchayat

Chapter 1 INTRODUCTION

1.1 Background of Preparatory Survey

The State of Uttarakhand is located in the mountainous area of the northern India blessed with rich biodiversity. However, the degradation of the forest resource has become evident in this region. The causes include over grazing, population pressure, and excessive and inappropriate forest resource harvesting in addition to the land conversion. As the forest resources become scarce, the forest dependent communities further exploit the forest resources as they have limited alternatives to meet the resource requirement for their livelihood. Thus, the needs to restore the degraded forests and to mitigate the resource pressures by providing alternative means of livelihood have emerged.

In the above context, the Uttarakhand Forest Department (UKFD) prepared a Detailed Project Report (DPR) on the “Uttarakhand Forest Resource Management Project (UFRMP or the project)” and submitted to the Japan International Cooperation Agency (JICA) to seek financial assistance. The proposed project is relevant to the development policy of the Government of India and aid policies of the Japan and JICA. Thus, a need to carry out the detailed review of DPR, the proposal, for its eligibility for loan, has emerged, and “JICA Preparatory Survey for Uttarakhand Forest Resource Management Project (the Survey)” commenced in July 2013.

1.2 Objectives of Survey

The objectives of the Survey are; 1) to review the details of the DPR with reference to relevant data, 2) to collect supporting information/ data for appraisal, 3) to suggest an appropriate implementation plan and operational framework, and 4) to propose modifications to DPR as required. The survey team also held a series of discussions with UKFD and a stakeholder meeting in order to fully capture the project context and incorporate into the project design. Based on the results of such field work, the Survey Team has achieved the objectives set forth and designed the project components, implementation process, and institutional framework along with the cost estimation for JICA mission to review and assess the loan eligibility of the proposed project.

1.3 Survey Team and Schedule

The Survey Team is comprised of seven International Specialists, and the assignment schedule of the survey team members is as below:

Table 1.3.1 Summary of the Assignment Schedule of the Survey Team Members

Position	Name	Mobilization	MM*
Team Leader/ Forest management	Mr. Shinichiro Tsuji	31 st July 2013	4.10
Additional Team Leader/ Community Development/ Livelihood Improvement	Dr. Michiko Ebato	3 rd August 2013	3.90
Forest GIS Planning	Mr. Shalabh Bharadwaj	17 th August 2013	1.00
Supply Chain Analysis	Dr. Manoj Pattanaik	4 th August 2013	2.00
Environmental and Social Consideration	Mr. Richard Rastall	3 rd August 2013	2.48
Institution	Ms. Haruko Chikaraishi/ Mr. Yoshito Mochizuki	3 rd August 2013	1.43
Disaster Mitigation	Mr. Hiroyuki Katsuro	22 nd August 2013	1.50
*Work in Japan is indicated in Bracket. Source: JICA Preparatory Survey Team		Field Work (MM)	14.06
		Work in Japan (MM)	2.35
		Total MMs	16.41

The Survey Team has engaged local consultants with relevant expertise in order to fully capture the local specificity in forest management, livelihood development and designing the suitable institutional framework for the project. Three national consultants were also engaged to review the requirements for erosion and flood control component.

Two field surveys were conducted between 31st July 2013 and 30th January 2014. The first field survey was conducted between 31st July 2013 and 31st of October 2013. During the first survey period, the Progress Report was prepared by mid September 2013 containing the results of the review of the DPR. Based on the Progress Report, the Survey Team prepared the Draft Final Report which included the project components, implementation schedule, and the cost. Preceding the second field survey conducted between 15th January 2014 and 30th January 2014, the DFR was reviewed by JICA. The Survey Team received the comments from JICA as a result of the review and revised the report accordingly. The revised report was shared with UKFD during the second field survey and also conducted verification of the data that was required before finalization of the Draft Final Report. This Final Report was prepared as a synthesis of a series of discussions among the stakeholders and rigorous review undertaken by the Survey Team during the Survey Period as above.

Chapter 2 STATE OF UTTARAKHAND

2.1. Uttarakhand – An Overview

The State of Uttarakhand is known for its hilly terrain with rich biodiversity. 86% of the state falls under hill and mountainous terrain. The altitude ranges between 1,000 m and below to 3,500 m and above and thus the distinct variations in agro-climatic zones are observed. Large scale commercial farming and grain productions are practiced in the plain area where the climate is warmer. As the elevation increases, the combination of livestock rearing and farming becomes a common livelihood activity. The forestland is 65% or 34,651 km² of which 46% comprises the Reserved Forests. The state also has large Civil & Soyam forests of 9,731 km² which includes the forest managed by Van Panchayats (VPs) (4,962 km²). The forest coverage in the past few years has not shown significant changes. Nevertheless, the rapid annual economic growth with the rate of 9.7% has brought waves of development in addition to population pressure and begun to pose threats to the ecology and landscape of Uttarakhand. The summary of the state of Uttarakhand is given in the table below.

Table 2.1.1 An Overview of the State of Uttarakhand

Particulars	Outlook	
Total Area ¹	53,484 km ² (Hillock – Mountain: 46,035 km ² , Flatlands : 7,448 km ²)	
Location ² / Altitude ²	lat: 28°43'N to 31°27'N Long 77°34'E to 81°02'E/ 210m – 7,817m	
Land use ¹ (% against total area)	Forest: 34,651 km ² (65%), Net sown area: 7,411 km ² (14%), Fallow: 1,142 km ² (2%), Non agricultural use: 2,164 km ² (4%)	
Forestland ¹ (% against total Forestland)	Reserved Forest: 24,609 km ² (46%) <ul style="list-style-type: none"> ▪ managed by UKFD: 24,261 km² (including 140km² managed by VPs) ▪ recorded completely Recorded with VPs: 348km² Protected Forest: 154 km ² (including Unclassed and Vested Forests; 0.3%) Civil & Soyam Forest: 9,731km ² (18%) <ul style="list-style-type: none"> ▪ Revenue Department: 4,769 km² ▪ VPs: 4,962 km² Private Forest: 158km ² (0.2%)	
Forest density ³ based on 2011 Assessment (% against total forest cover)	Forest cover 24,496 km ² (45.80% of the geographical area of the state) Very Dense Forest 4,762 km ² (19.4%) Moderately Dense Forest 14,167 km ² (57.8%) Open Forest 5,567 km ² (22.7%) Scrub 271 km ² (0.005% of the total geographical area)	
Eco-Climatic Zone ²	Sub-Tropical (1,000m and below), Warm Temperate: 1,000 - 1,500m), Cool Temperate: (1,500 - 2,500m), Sub-Alpine (2,500m - 3,500m), Alpine (3,500m and above), Nival (5,500 and above)	
Protected Area ¹	Wildlife Protected Area: 6 areas, National Park: 6 parks, Total: 7,335 km ² (12.9% of the total land area)	
Average Temperature ²	South East (Flatlands): 21°C - 38°C, Northern area (Mountain): -1°C ~ 21°C	
Rainfall/ Snowfall ²	Annual Rainfall: 1,606 mm, Snowfall: Northern area - 3~5m (December – March)	
Population/ Population Density ⁵	10.11 million persons (approx.), 189/ km ² (2011) (National Average: 382/ km ²)	
Rural/ Urban Population ⁴	7million (69%) / 3million (31%)	
Annual Exponential Population Growth Rate (2001- 2011) ⁵	Uttarakhand: 1.6%/year/ National Average: 1.8%	
GDP at current price (2012-13)	Uttarakhand ⁷ : INR 1,083 Billion	Annual Growth Rate (2011-12)
	India ⁸ : INR. 94,601 Billion	Uttarakhand ⁴ : 9.7% GNDP Growth Rate (Current Price) ⁸ : 13.3%

Particulars	Outlook
Per Capita GDP at current prices (2012-13) ⁷	Uttarakhand: INR 106,564 (2012-13) / National: INR 78,009
Scheduled Tribe (ST)/ Scheduled Caste (SC)	Uttarakhand ⁶ : ST: 2.9%/ SC: 18.8% National Average ⁵ : ST: 8.2% / SC: 16.2%
Literacy Rate (2011) ⁵	Uttarakhand: 79.6%/ National Average: 74.0%

Source: ¹Uttarakhand Forest Statistics (2011-12); ²DPR; ³ India State of Forest Report 2011; ⁴Uttarakhand at a Glance (2012-13); ⁵ Census 2011; ⁶ JICA Preparatory Survey Team Estimate based on Census 2011 data; ⁷ Gross State Domestic Product at Factor Cost by Industry At Current Prices (15th June 2013) (Directorate of Economics and Statistics, Uttarakhand); ⁸ Handbook of Statistics of the Indian Economy 2012/ 13 (Reserved Bank of India)

2.2. General Condition in Uttarakhand

2.2.1 Topography

Uttarakhand State is located at the foot of the Himalaya Mountains. The differences of elevation of several thousand meters are reflected in the complex topography with its many up hills and down hills.

Uttarakhand has distinct and varied physical features, varying from fertile Terai plain land along the southern most part to very high snow covered hilly region in the North, Uttarakhand State comprises of five latitudinal zones with ill defined boundary line i.e. the Terai-Bhabar, the Shiwaliks, the Lower Himalaya, the Higher Himalaya and the Trans-Himalaya. (Disaster Management in the Hills; Dr. Satendra IFS 2003)

(1) Terai-Bhabar Belt

The Bhabar belt of Uttarakhand represented by a narrow strip of fertile land is one of the most developed parts of the country today. This pocket of 10-25 km width starting from the west of Dehradun district extends up to Nainital Terai belt in the east. Bhabar Terai tract is traversed by various rivers, i.e. Yamuna, Ganga, Ram Ganga, Sharda and their small rivulets.

This is the region where these rivers after a long and tiring journey across the hills reach the plain which causes a sudden reduction in speed and load bearing capacity. Due to this reduction in speed and load bearing capacity of rivers, they deposit the heavier loads transported by them in the form of river fans.

The northern part of Bhabar–Terai belt is marked by many such fans comprising of coarse material up to the size of a big boulder. The southern part of the belt is comparatively plain and comprises of fine grained alluvium deposits.

(2) Shiwaliks

The northern boundary of Bhabar is marked by low-lying hilly region traversed by almost plain latitudinal areas known as ‘doons’. There are five ‘doons’ in Uttarakhand, namely, Dehra, Chaukhamba, Kothari, Patli and Kotaduns from west to east. The hillocks of Shiwalik belt varying in altitude between 700 and 1,200 meters are often comprised of very loose and fragile rocks like sandstone, shale etc.

(3) The Lesser Himalaya

The Lesser Himalayan belt with an average width of 70-75 km is more massive mountainous tract of different rocks. The area is one of the most densely populated region of Uttarakhand and is marked by large number of fertile river valleys and many commercial centers, i.e. Ranikhet, Almora, Nainital, Lansdowne, Pauri, Srinagar, Tehri, Uttarkashi, Chamba, Mussoorie, Gopeshwar, Joshimath, etc. Due to availability of water resources and tolerable climate, the area has to face a considerable population pressure which has adversely affected the environment of the region. Deforestation, forest fires, landslides, gully and soil erosion, floods etc. are the manifestations of such environmental degradation in the area.

(4) The Higher Himalayas

The northern boundary of Lesser Himalayan Belt is marked by sudden altitudinal changes in the mountainous ranges. The belt with a width varying between 30- 50 km is marked by very high snow covered peaks (5,000 m to more than 7000 m.). Some important peaks of the region include Bander Punch (6,815 m), Gangotri (6,615 m) and Nandadevi (7,815 m).

The area is marked by extensive glaciers, snow covered highly elevated sharp peaks and ridges, deep river gorges and snow bound moraines consisting of huge boulders and other transported material.

(5) Trans Himalayas

The northern extreme Uttarakhand consisting of Trans Himalayan mountain ranges is a rain shadow zone. This area bordering with the neighboring countries, due to its extreme climatic condition and very low rainfall, is very thinly populated. Due to its water bearing rivers and rivulets, Uttarakhand is of very strategic importance for the country. These rivers form main water source for whole of the northern India.

2.2.2 Geology

According to “The Plate Tectonics Theory”, the Indian subcontinent was once attached to Australia and millions of years ago the subcontinent started drifting towards North at a rate of 20 cm per year. Due to this northward movement, a time came when the subcontinent collided against the Asian continent. As a result, the Indian continent happens to pass underneath the Asian continent. However, due to its lightweight, the Indian continent could not submerge or sink into the asthenosphere and instead, this plate slid between the asthenosphere and Asian-Plate receiving continuous pressure toward the North. Thus, the part of Asian- Plate and the sediment lying between these two plates rose high and formed the great mountain range of Himalayas.

The Indo-Australian plate is still in movement phase and creating pressure on Eurasian-Plate.

Due to this pressure, the Himalayas are still uprising. Besides uplifting of the Himalayas, the pressure of plates is creating stress on the rocks forming the mountain. Due to this stress, the rocks are deformed in various patterns, i.e. tilting, breaking and moving away rupture. These deformations are called faulting, folding and thrusting in geological terms and are basically the ways to release the stored energy in the rock bodies, created due to continuous increasing stress as a result of plate movement. Whenever this energy is released, the rock bodies shatter and roll, resulting in earthquakes.

As per new geological investigation, the thrusts are not simple planer features, instead they are represented by many sub-planar features called imbricates that run almost parallel to the thrust plane but at the higher angles.

The recent investigations in the field of Himalayan geotectonic reveal that the Indo-Australian plate still continues to drift northward at the rate of 5 to 6 cm per year.

Geology of India is compiled by Ministry of Mines and Minerals Geological Survey of India (GSI) and some of the typical landscapes are shown below.



Source: JICA Preparatory Survey Team

Figure 2.2.1 Geology of India and Uttarakhand

2.2.3 Climatic Feature

With the topography having differences of elevation of several thousand meters, Uttarakhand State has different meteorological environment in some areas.

Elevations, slope aspects, proximity of glaciers, forest etc. are the various factor that influence the climate of the region in Uttarakhand.

These factors make the climatic pattern very complex. Depending upon these factors, the climate conditions vary from valley to valley and from one side of mountain to another side.

The Terai Bhabar region of the State has very hot and humid climate. The mean temperature during the winter in this belt is around 20°C and, in summer, it crosses 40°C. The average temperature generally decreases with altitude. Other climatic zones in Uttarakhand includes: subtropical zone below 1,000m; warm temperate from 1,000 – 1,500m; cool temperate between 1,500 – 2,500m; sub-alpine 2,500 – 3,500m; alpine 3,500 – 5,500m; and 00 m elevation cold temperate; and nival 5,500m and above.

Monsoon in the region commences around in the last week of June and continues up to the end of September. The annual rainfall rate shows extensive variation from east to west and from north to south. Average annual rainfall is about 1,500 mm in the Bhabar-Terai belt. The Lesser Himalayan region receives annual rainfall of around 900 mm.

Nainital is one of the most rain-fed regions where annual rainfall reaches up to 2,500 mm. From January to March, the highest peaks of Uttarakhand receive heavy to medium snowfall which affects the climate of whole State.

2.2.4 Forestland¹

Uttarakhand has a total 34,651 km² of recorded forestland, out of which 24,261 km² is Reserved Forest, 99 km² is Protected Forest, 55 km² is Vested Forest (all under the administrative control of Forest Department), 4,769 km² is Civil & Soyam Forest (under administrative control of Revenue Department), 5,450 km² is recorded as Panchayati Forest (under administrative control of VPs) and 158 km² as Private Forest (which includes Cantonment Forest, Municipality Forest & private forests).

Table 2.2.1 Classification of Forestland according to Management and Control

	Particulars	Area (km ²)
1	Forest Department (FD)	
	Reserved Forests	24,261
	Protected Forests	99
	Unclassed and Vested Forests (has legal status of protected forest)	55
	Sub-total area with FD	24,415
2	Revenue Department (RD)	
	Civil & Soyam Forests	4,769
3	Forest/ Van Panchayats (VP)	
	Reserved Forests	
	Reserved Forest recorded with FD but managed by VPs	(140)
	Reserved Forest which is completely recorded with VPs	348
	Protected/ Civil & Soyam Forests	4,962
	Sub-total area with VP	5,310
4	Private/ Other agencies	
	Private/ Other agencies (Municipal, Cantonment, Central Govt. etc.)	158
	Total	34,651

Source: Uttarakhand Forest Statistics, 2011-12, Uttarakhand Forest Department

¹ All Statistics figures from “Uttarakhand Forest Statistics 2011 -12”, UKFD.

2.2.5 Socio-economic Profile

(1) Demographic Statistics

The total population of Uttarakhand is reported to be approximately 10 million with an average household size of 4.9 persons. The most populous district is Dehradun followed by Haridwar and Udham Singh Nagar (US Nagar) which are all located in the plain area, whereas the least populated districts are Rudraprayag and Champawat.

The SC population accounts for 18.8% of the total population whereas the ST population is 2.9% of the same. The percentage of the SC population is the highest in Haridwar (21.7%) followed by US Nagar (12.6%) and Dehradun (12.1%). Most of the SC population is traditionally engaged in agriculture supporting activities like making farm implements and handicrafts and worked as agriculture laborers. Their settlements are often found in a specific area in a district.

The share of the ST Population is the highest in US Nagar and Dehradun. The ST population in the former District is mostly comprised of Tharu and Buxa tribal communities whose primary occupation is farming. Dehradun has the second highest rate of tribal population in the state and predominated by Jaunsari tribal community. Pithoragarh has 6.7 % (Raji and Bhotia tribal groups) and Chamoli marks 4.2% ST population (Bhotia Tribal group).

Further to note, the outflow of the population especially in the hill area is observed for employment and for other purposes². The migration of men has had an impact on the women who are often left to take care of their households on their own³.

Table 2.2.2 Demographic Statistics

District	Households		Population			SC		ST	
	No	Size	Total	Male	Female	Total	Distribution	Total	Distribution
Uttarkashi	67,602	4.9	330,086	168,597	161,489	80,567	4.3%	3,512	1.2%
Chamoli	88,964	4.4	391,605	193,991	197,614	79,317	4.2%	12,260	4.2%
Rudraprayag	53,542	4.5	242,285	114,589	127,696	47,679	2.5%	386	0.1%
Tehri Garhwal	132,714	4.7	618,931	297,986	320,945	102,130	5.4%	875	0.3%
Dehradun	347,001	4.9	1,696,694	892,199	804,495	228,901	12.1%	111,663	38.3%
Garhwal	161,778	4.2	687,271	326,829	360,442	122,361	6.5%	2,215	0.8%
Pithoragarh	114,730	4.2	483,439	239,306	244,133	120,378	6.4%	19,535	6.7%
Bageshwar	58,046	4.5	259,898	124,326	135,572	72,061	3.8%	1,982	0.7%
Almora	140,577	4.4	622,506	291,081	331,425	150,995	8.0%	1,281	0.4%
Champawat	53,953	4.8	259,648	131,125	128,523	47,383	2.5%	1,339	0.5%
Nainital	191,383	5.0	954,605	493,666	460,939	191,206	10.1%	7,495	2.6%
US Nagar	308,581	5.3	1,648,902	858,783	790,119	238,264	12.6%	123,037	42.1%
Hardwar	338,104	5.6	1,890,422	1,005,295	885,127	411,274	21.7%	6,323	2.2%
Total	2,056,975	4.9	10,086,292	5,137,773	4,948,519	1,892,516	18.8%	291,903	2.9%

Source: Census of India 2011. Household size/ % of SC/ST population calculated by JICA Survey based on the Census data (Sep 2013).

The forest division wise demographic data is shown in **Attachment 2.2.1**.

(2) Economy and Employment Statistics

Uttarakhand has shown a rapid economic growth. In 2011-12, 9.65% of grow rate was anticipated (Uttarakhand at a glance, 2012-13) with the Gross State Domestic Product(GSDP) at current price of

² IFAD/ ICIMOD. (2010). Labor Migration and Remittances in Uttarakhand.
(http://lib.icimod.org/record/8089/files/attachment_735.pdf accessed on 14 Sep 2013).

³ Ibid.

INR 1,083 billion at current prices. However, the growth rate of the sector wise GSDP⁴ varies from sector to sector. The manufacturing and electricity, gas, water supply sectors have achieved the highest growth rate. The per/ capita GSDP has grown nearly 4 times more than that of 2004-2005 from INR 27,497 to INR 106,564.

Table 2.2.3 Sector wise GSDP at Current Prices (June 2013) (Unit: INR 100,000)

Sector/ Sub-Sector	2004-2005	%	2009-2010	%	2010-2011	%	2011-2012	%	2012-2013	%
Agriculture	411,370		734,128		857,844		955,917		1,071,321	
Forestry & Logging	139,751		256,115		308,405		354,638		409,113	
Fishing	919		2,158		2,753		3,562		4,428	
Mining & Quarrying	29,894		57,784		70,851		90,573		100,011	
Total of Primary Sector	581,934	23.5%	1,050,185	19.8%	1,239,853	15.5%	1,404,690	14.8%	1,584,873	14.8%
Manufacturing	315,559		1,610,496		1,935,711		2,146,358		2,406,408	
Construction	315,686		587,487		695,064		813,424		989,019	
Electricity, Gas & Water Supply	38,446		217,391		301,158		334,473		417,793	
Total of Secondary Sector	669,691	27.0%	2,415,374	32.5%	2,931,933	34.4%	3,294,255	34.1%	3,813,220	34.9%
Transport, Storage & Communication	162,784		452,672		526,791		618,772		734,785	
Trade, Hotels & Restaurants	419,564		1,633,282		1,939,239		2,152,138		2,435,071	
Banking & Insurance	93,663		204,636		268,745		313,445		379,573	
Real Estate, Ownership of Dwellings & Business Services	159,893		336,533		406,772		468,205		551,065	
Public Administration	133,372		472,270		505,127		538,621		615,499	
Other Services	257,667		508,046		578,101		625,734		720,253	
Total of Tertiary Sector	1,226,943	49.5%	3,607,439	47.7%	4,224,775	50.1%	4,716,915	51.0%	5,436,246	50.3%
Gross State Domestic Product (GSDP)	2,478,568	100.0%	7,072,998	100.0%	8,396,561	100.0%	9,415,860	100.0%	10,834,339	100.0%
Per Capita GSDP (Rs.)	27,497		72,603		84,942		93,905		106,564	

Source: Extracted from the Sector Wise State GDP. Directorate of Economics & Statistic Uttarakhand. (June 2013).

In 2012-13, the Sector wise GSDP generated from the Trade, Hotels & Restaurants was INR 243.5 billion which generated the highest GSDP in the reporting year in all the sub-sectors. The sub sector that has generated the second the highest value was manufacturing accounting for INR 240.6 billion. The Tourism sector shows a prominent opportunity for further development and, as per the study conducted by the National Council for Applied Economic Research, tourism contributes to 2.78 % of the Gross Domestic Product (GDP) and direct employment generated in around 4.59%.

On the other hand, the statistics shows that the growth has not brought benefits to household economy in Uttarakhand. The Gini Coefficient, an indication of the inequality in household economic status, shows that the rural areas of Nainital (0.47), US Nagar (0.35) and Uttarkashi (0.31) are highly inequitable⁵. This suggests that the poor especially in these areas may require interventions to ease the economic disparities.

Though agriculture sector employs 1.2 million workers (both cultivators and agricultural labors) and provides employments to 620,000 marginal workers (both cultivators an agriculture laborers), the GSDP produced by the sector is INR 107.1 billion which is less than halve of what is achieved in the said manufacturing and Trade, Hotels& Restaurants sub-sectors. This reflects the performance of the sector that gets affected due to low productivity and small holdings in hills that spread over 93% of the total geographical area of the state.

⁴ All sector GDP Figures: Directorate of Economics & Statistics. (2013). ([http://des.uk.gov.in/files/GSDP-NSDP_\(2004-05_to_2012-13\)_-Report_as_on_15_June_2013.pdf](http://des.uk.gov.in/files/GSDP-NSDP_(2004-05_to_2012-13)_-Report_as_on_15_June_2013.pdf) accessed on 11th September 2013). All Employment figures derive from Uttarakhand at a Glance (2012 – 13).

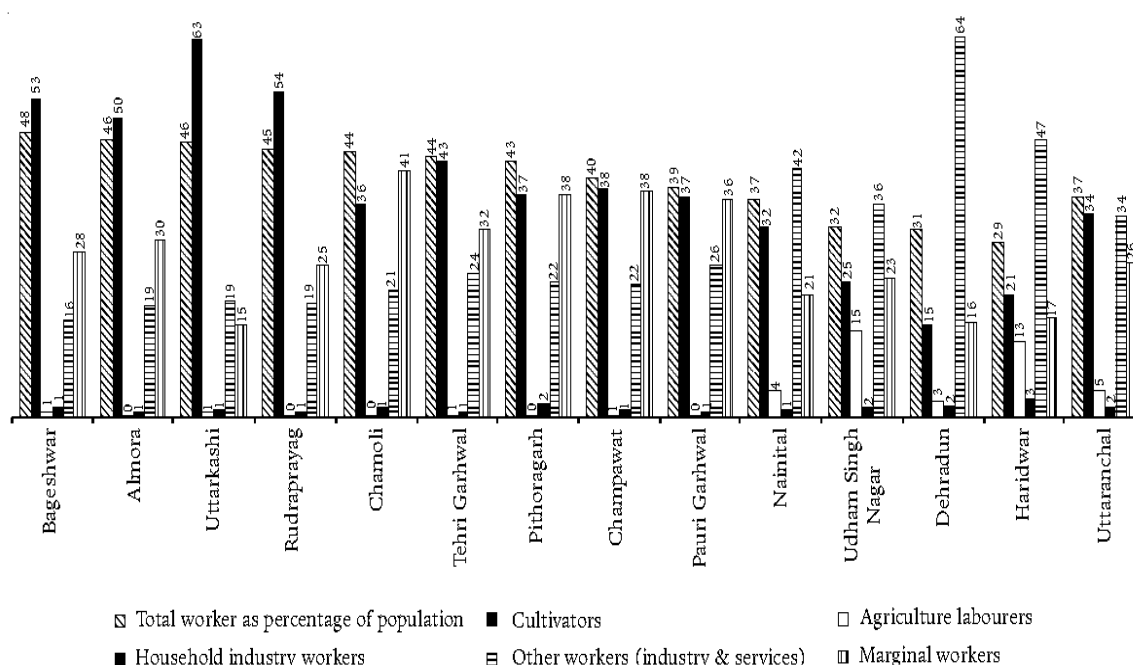
⁵ Planning Commission, Government of India. (2009). Development Report – Uttarakhand. Academic Foundation; New Delhi. (http://planningcommission.nic.in/plans/stateplan/sdr/sdr_uttarakhand1909.pdf)

Table 2.2.4 Category- Wise Labor Force (2001)

Worker category	Number
Main workers	2,322,000
(i) Cultivators + Agriculture Laborers	1,210,000
(ii) Household Industry workers	49,000
(iii) Other workers	1,063,000
Marginal Workers	812,000
(i) Cultivators + Agriculture Laborers	620,000
(ii) Household Industry workers	23,000
(iii) Other workers	169,000

Source: Uttarakhand at a Glance (2012-13). Directorate of Economics & Statistics Uttarakhand.

The District –sector wise employment shows a variation in the sector wise employment and suggests the possible disparities in income. Figure below shows that around 50% of workers are cultivators and that the share of workers in the industrial and service sectors is the highest (64%) in Dehradun and least (16%) in Bageshwar District.



Source: Uttarakhand State Development Report (2009)

Figure 2.1.2 Employment by Sectors in Uttarakhand

As Dehradun has the highest number of employees in the most productive sector of industry and services, one may speculate that more number of people may earn higher income than those districts where the agriculture is the main employment sector.

(3) Basic Human Needs

Despite the rapid economic growth of the state economy, its benefit has not reached the every corner of the rural communities equally. The statistics shows the gap in accessing basic and fundamental infrastructures and social services between the urban and rural areas.

1) Road and Drinking Water Supply

The table below shows indicators which illustrate disparities among the districts in terms of basic infrastructure. The road connectivity is very scarce in Uttarkashi and Pithoragarh. The household electrification is available for 87% of the households on an average whereas the drinking water supply was only available for 58.25% of the households on an average. Bageshwar district showed the least

accessibility to the household drinking water supply (24.8%) and Almora, the second lowest accessibility, with 26.12% of the households. As five out of 13 districts have less than 40% of accessibility to the same, a need for further assistance is evident. The availability of household toilet is 65.77% on an average. Uttarkashi shows the least availability of 43.73% whereas high availability was recorded in Dehradun (86.45%) and Nainital (79.50%).

2) Education

Overall, the literacy rate in Uttarakhand is 72% (Census 2001), which is higher than the all India rate (65%). Access to primary schooling is 96% and 98% for upper primary. Secondary education is also widely available to 83% of school going age children⁶. On the other hand, adult literacy (+15 years) was reported to be low amongst women, ST, and SC in Uttarakhand (Dept of School Education, n.d.⁷). Six districts were named for their adult women literacy rates below 50%: namely, Uttarkashi (36.5%), Tehri Garhwal (38.2%), Haridwar (44.7%), Champawat (43.48%), US Nagar (45.1%), and Bageshwar (47.6%)⁸. The discrepancies between the literacy rate and school enrollment rate may suggest the possible limited educational opportunities for the drop outs and adults who would not have access to formal education services.

3) Health

Uttarakhand fares relatively well against the national averages in terms of health statistics such as Birth Rate, Death Rate, Infant Mortality Rate. However access to basic and primary health care facilities is uneven across the State. The estimation of Health centre coverage was done on the basis of population data of census 2011 and data on District Statistical Magazine 2011. Champawat district shows 259,648 persons to be covered by a primary health center as compared to 161,590 persons in Dehradun. The number of community health care centre is also minimal with reference to the population that they have to cater for.

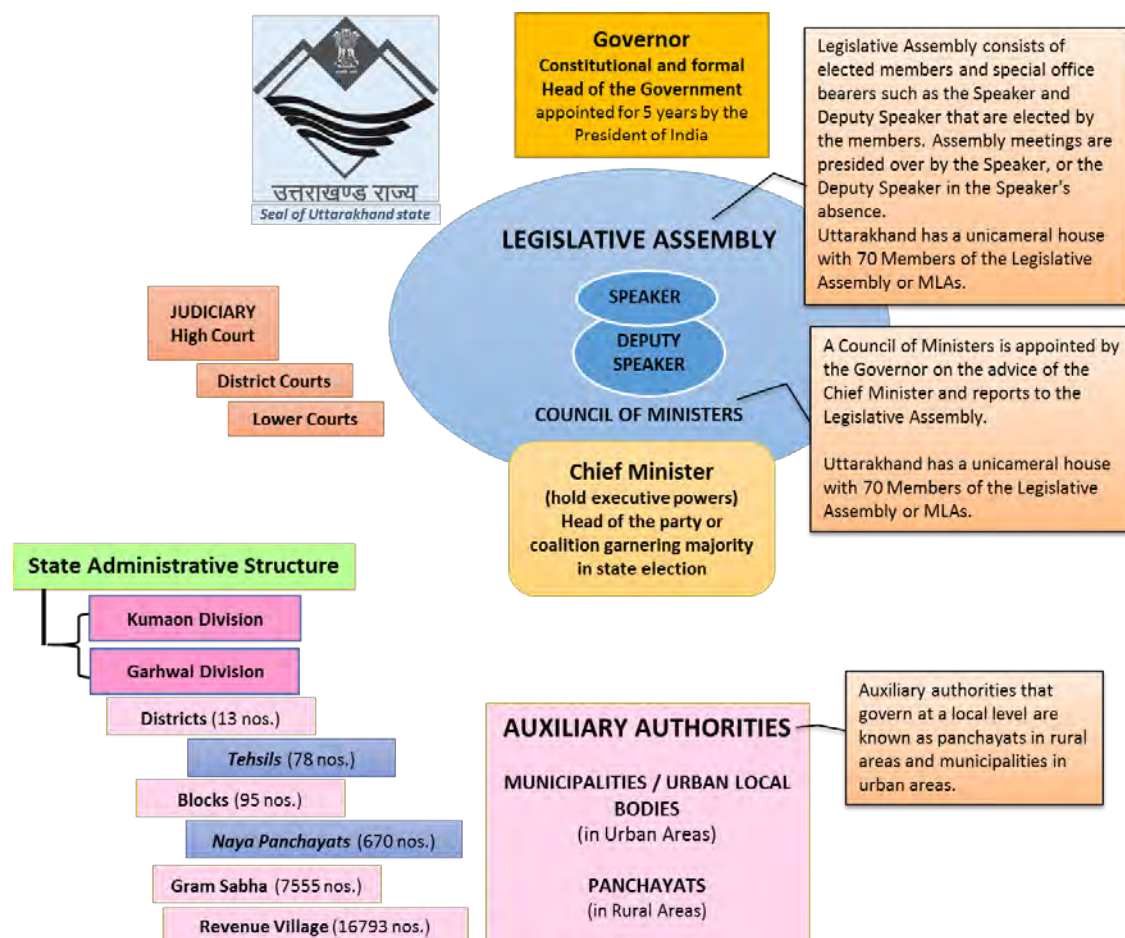
⁶ http://planningcommission.nic.in/plans/stateplan/Presentations12_13/uttarakhand2012_13.pdf

⁷ http://schooleducation.uk.gov.in/files/pdf/39_SAAKSHAR%20%20BHARAT%20%20PROGRAM%20%20IN%20%20UTTARAKHAND.pdf

⁸ Adult Literacy Rate estimated based on the Census 2001 data in the “Saakshar Bharat Program in Uttarakhand”.

2.3. State Administration

2.3.1 State Administrative Structure



Compilation: JICA Preparatory Survey Team

Figure 2.3.1 State Administrative Structure

2.3.2 Administrative Divisions

There are 13 districts in Uttarakhand which are grouped into two administrative divisions of Kumaon and Garhwal.

Table 2.3.1 List of Divisions and Districts in Uttarakhand

Chapter 3	Kumaon Division	Chapter 4	Garhwal Division
1)	Almora District	1)	Dehradun District
2)	Bageshwar District	2)	Haridwar District
3)	Champawat District	3)	Tehri Garhwal District
4)	Nainital District	4)	Uttarkashi District
5)	Pithoragarh District	5)	Chamoli District
6)	US Nagar District	6)	Pauri Garhwal (commonly known as Garhwal) District
		7)	Rudraprayag District

Source: JICA Preparatory Survey Team

Each district is governed by a district commissioner or district magistrate. The districts are further divided into sub-divisions, which are governed by sub-divisional magistrates. The sub-divisions are comprised of blocks containing panchayats (village councils) and town municipalities.

2.3.3 Key Relevant Agencies

Table 2.3.2 Key Agencies of the State of Uttarakhand

Agencies	Mandate	Area of Operation / Technical Expertise/ Capacity
a) Revenue Department	<p>The Revenue Department is responsible for overall management state revenue and lands under its control. The Department controls the use of land outside the Reserved Forests under the control of Forest Department and other lands under the control of the Ministry of Defense, etc. Principal Secretary is the head of the Revenue Department within the government structure and reports to the Revenue Minister.</p> <p>The Board of Revenue is the highest judicial body of the revenue department. The main aim of the Board of Revenue is to control, regulate and upgrade all the judicial and administrative work of the revenue department. The Chairman, Board of Revenue works as the Head of Department.</p>	<i>Chakbandi</i> (Land Consolidation), Land Acquisition, Revenue collection, Revenue Police, Revenue cases, Budget, Transfer of land to departments
b) State Disaster Management Department and Disaster Mitigation & Management Centre	<p>Under Section 14 of the Disaster Management Act, 2005 State Disaster Management Authority (SDMA) is established, and the Chief Minister of the State is the Chairperson. SDMA is mandated for drawing up the state disaster management plan, and implementing the National Plan. At district level, District Disaster Management Authority (DDMA) is established and the Collector is the Chairperson. SDMA was upgraded to State Disaster Management Department recently.</p> <p>Disaster Mitigation & Management Centre (DMMC) is the apex center, and is working as autonomous institution under aegis of Department of Disaster Management Government of Uttarakhand.</p>	Disaster Mitigation & Management, training programs, maintaining a network of experienced experts working in the field and institutions of excellence, consultancy services to all levels of government, international agencies and non-government organizations
c) Horticulture Department	<p>To increase the area, production and productivity of fruits, vegetable, spices, Medicinal and floriculture crops.</p> <p>To implement the different programmes envisaged under state plan and centrally-sponsored scheme, as National Horticulture Mission, National Mission on Micro Irrigation Scheme, Rashtriya Krishi Vikas Yojana, National Bamboo Mission, National Mission for Medicinal Plants, National Horticulture Board, Spices Development Board and other agencies</p>	Demonstration and distribution of mini-kits, disease free and true to type varieties of fruits, vegetable and spices crops, high quality grafted plants of Mango, Guava, Aonla, Ber etc. in nurseries, use of drip irrigation system, quality planting material and nursery, post-harvest technologies, food processing, preservations and packaging, marketing
d) Agriculture Department	To increase production and productivity of food grain, pulses and oilseeds crops; introduction of seed varieties, plant and nutrient management, soil testing, organic farming, diversification of agriculture, post-harvest technologies, strengthening of market interventions, and use of farm machinery to make the agriculture more	Soil testing, quality control, extension through SAMETI (training and human resource development) and ATMA (agriculture extension at districts), demonstrations,

Agencies	Mandate	Area of Operation / Technical Expertise/ Capacity
	<p>profitable occupation</p> <p>To implement RKVY (National Agriculture Development Plan), District Plan, Nutri farm, National Food Security Mission</p>	<p>agriculture implements, post-harvest technologies, nursery and tissue culture, technology, organic farming, composting technologies, drip irrigation, sprinklers technologies</p>
e) Uttarakhand Bamboo and Fiber Development Board (UBFDB)	<p>To create rural livelihood opportunities in Uttarakhand through effective utilization of bamboo and natural fiber species. The specific objectives of UBFDB are:</p> <ul style="list-style-type: none"> ▪ Development and management of bamboo and fiber resources in a sustainable manner. ▪ Enhancing employment and income generating opportunities for the rural poor using bamboo and fiber as the prime resource. ▪ Promoting value addition in bamboo and ringal handicrafts through improved processing, product diversification and design development. ▪ Establishing bamboo industrial products as a new industrial sub-sector. ▪ Research and development related to bamboo and fiber products 	<ul style="list-style-type: none"> ▪ Nursery raising and facilitating plantation ▪ Capacity building of artisans ▪ Technical training for design development. ▪ Establishing market linkages. ▪ Common facility centres (8 nos) for bamboo, ringal and fiber processing and a fiber carding plant at Dehradun.
f) State Medicinal Plants Board (SMPB)	<p>The SMPB is the nodal agency for medicinal and aromatic plants in Uttarakhand.</p> <p>The main objectives of SMPB are:</p> <ul style="list-style-type: none"> ▪ Coordinating with and implementing the schemes of National Medicinal Plants Board (NMPB). ▪ Identification, inventorization and quantification of medicinal and aromatic plants (MAPs). ▪ Promotion of ex-situ / in-situ cultivation and conservation of medicinal plants. Assisting MAP collectors and growers in transportation and marketing of their produce. ▪ Value addition and adoption of improved techniques in order to effectively market MAPs. ▪ Scientific and technological research related to medicinal and aromatic plants. ▪ Development of protocols for cultivations and quality control. ▪ Formulation of policy guidelines for MAP sector in the state. <p>Herbal Research and Development Institute (HRDI), Gopeshwar and Centre for Aromatic Plants (CAP), Selaqui are two wings of SMPB. HRDI is promoting commercial cultivation of MAPs while CAP is engaged in processing and marketing of aromatic plants.</p>	<ul style="list-style-type: none"> ▪ Capacity building of farmers in MAP cultivation ▪ Nursery establishment for providing quality planting material ▪ 50 % assistance on cultivation cost of 26 MAPs up to a maximum of INR 100,000. ▪ Free planting material to farmers up to 0.1 ha area ▪ 95% state assistance to farmer clusters for setting up field distillation units ▪ Issuing Transit pass to MAP farmers at district level ▪ Revolving fund of INR 5 million established for buy-back of aromatic oil
g) Uttarakhand Organic Commodity Board (UOCB)	<p>Uttarakhand Organic Commodity Board (UOCB) is the nodal agency in the state to promote organic activities in agriculture and allied sectors like horticulture, MAPs and animal husbandry throughout the state.</p> <ul style="list-style-type: none"> • Facilitate backward and forward linkages for assisting the farmers to take up organic cultivation 	<ul style="list-style-type: none"> ▪ Establishing market linkages with buyers from across the country. ▪ Facilitating organic certification for farmers ▪ State trainings centre for organic farming near

Agencies	Mandate	Area of Operation / Technical Expertise/ Capacity
	<ul style="list-style-type: none"> Facilitate marketing, brand building and other related activities for promotion of organic products Capacity building of organic producers. Long term marketing relations with large international buyers. Facilitation of organic certification for producers. 	Ranikhet

Source: Compiled by JICA Preparatory Survey Team

2.3.4 Fiscal Condition

(1) State Budget and Revenue

Uttarakhand is a Special State that receives 90% of its total budget from the GoI as a grant and contributes 10% from its own revenue sources. The Table below shows the State budget between FY 2009/10 and FY 2012/ 13. As seen, the scale of its budget has increased steadily between the reported period. The total receipts have grown by 44% in FY 2012/ 13 compared to that of FY 2009/ 10. Total Receipts comprises of approximately 80% of the Revenue Receipts and 20% of the Capital Receipts. The total expenditure between FY 2009/19 and FY 2012/ 13 has grown by 34% and comprise of approximately 70% of the Non-Plan Expenditure and 30% of the Plan Expenditure.

Table 2.3.3 Uttarakhand State Budget at a Glance (INR million)

Particulars	FY2009/10 (Actual)	FY2010/11 (Actual)	FY2011/12 (Actual)	FY2012/13 (Revised)
1. Revenue Receipts	94,861.4	116,081.7	136,914.2	145,428.9
2. Capital Receipts	31,372.1	31,730.3	37,343.5	36,361.4
3. Total Receipts	126,233.5	147,812.0	174,257.7	181,790.3
4. Non-Plan Expenditure	103,868.0	103,485.6	128,383.6	131,534.3
5. Plan Expenditure	38,101.6	43,672.9	46,251.6	58,193.9
6. Total Expenditure	141,969.6	147,158.5	174,635.2	189,728.2

Source: <http://budget.uk.gov.in/>, Government of Uttarakhand

(2) Revenues

Revenue receipts are divided into tax and non-tax revenue. Tax revenues are made up of taxes such as income tax, corporate tax, excise, customs and other duties which the government levies. Non-tax revenue consists of interest and dividend on investments made by government, fees and other receipts for services rendered by the Government. Total Revenue receipts for FY 2012/13 was INR145,429 million, increase by 53% since FY 2009/10.

Capital receipts are loans raised by the Government from public including Market Loans, borrowings by the Government from Reserve Bank and other parties through the sale of Treasury Bills, loans received from foreign Governments and bodies, and recoveries of loans granted by the Central Government to State and Union Territory Governments and other parties. In comparison to the Revenue receipts, the Capital receipts for FY 2012/13 were INR36,361 million (up 16%) since FY 2009/10.

(3) Expenditures

Planned expenditure is essentially the budget support to the annual plans. This is typically considered developmental spending (on health, education, infrastructure and social goals). Like all budget heads, it is also split into revenue and capital components. As the economy of the state has grown, Plan expenditures also increased to INR58,194 (53%) in FY 2012/13 since FY 2009/10.

Non-plan revenue expenditure is accounted for by interest payments, subsidies (mainly on food and fertilizers), wage and salary payments to government employees, grants to States and Union Territories governments, pensions, police, economic services in various sectors, other general services such as tax collection, social services, and grants to foreign governments. Non-plan capital expenditure mainly includes defense, loans to public enterprises, loans to States, Union Territories and foreign governments. The Non-Plan expenditure of the state for FY 2012/13 was INR131,534, increase by 27% since FY2009/10.

(4) Fiscal Deficit

Gross fiscal deficit of Uttarakhand as percentage of GSDP has declined to 3.3% during FY2011 as compared to 8.3% in FY2010. Primary deficit as a percentage of GSDP has declined from 5.1% to 0.3% during the same period. The revenue deficit has also declined from 2.4% in FY2010 to 0.3% of GSDP during 2011. Primary Revenue Balance has declined to 3.2% from 0.8% of GSDP during the same period.

Table 2.3.4 Fiscal Indicator (% of GSDP)

Fiscal components	FY2005/8 (Average)	FY2009	FY2010 (RE)	FY2011 (BE)
GFD/GSDP	4.9	4.6	8.3	3.3
RD/GSDP	1.4	0.6	2.4	0.3
PD/GSDP	1.9	1.6	5.1	0.3
PRB/GSDP	4.5	3.5	0.8	3.2

Source: PHD Research Bureau, Compiled from Reserved Bank of India

Note: RD: Revenue Deficit, GFD: Gross Fiscal Deficit, PD: Primary Deficit, PRB: Primary Revenue Balance BE: Budgeted Estimates, RE: Revised Estimates, underline refers to surplus.

2.4. Relevant Policies on Natural Resources and Climate Change

Forestry sector of India is governed by a number of clearly defined laws and regulations for long. Thus, the proposed project is required to have the operational structure and activity components taking into consideration of such applicable laws and regulations. If necessary, the changes may need to be proposed to achieve the project objectives and for the betterment of the community based forest management in the state. Moreover, the policy decision manifested in the National and State Development plans would also affect the environment in which the proposed project would be designed and implemented and apparently, the project would require to help the government to achieve the developmental objectives stipulated in such plans. Thus, the Survey team has reviewed relevant documents and the summary is given in the table below.

Table 2.4.1 Relevant Policies

Policy	Description/Main Provisions of Relevance
National Forest Policy (1988)	<p>Major policy objectives:</p> <ul style="list-style-type: none"> ▪ Maintenance of environmental stability through preservation and, where necessary, restoration of the ecological balance that has been adversely disturbed by serious depletion of the forests of the country. ▪ Increasing substantially the forest/tree cover in the country through massive afforestation and social forestry programmes, especially on all denuded, degraded and unproductive lands. ▪ Meeting the requirements of fuel-wood, fodder, minor forest produce and small timber of the rural and tribal populations.
National Forestry Action Plan(NFAP/ 1999)	<p>In 1999, Ministry of Environment and Forests(MoEF) issued the NFAP for a period of 20 years (four Five Year Plans from the 10th Plan onwards) starting in 2002. The NFAP projected large gaps between demand and supplies of timber, wood fuel and fodder resources and recommended several strategic action points to reduce the gap. The NFAP, 1999 proposed 5 strategic action plans:</p> <ul style="list-style-type: none"> ▪ Protect existing forest resources ▪ Improve forest productivity ▪ Reduce total demand ▪ Strengthen policy and institutional framework. ▪ Expand forest area.
12 th National Five Year Plan (2012-2017)	<p>Building on the platform of rapid economic growth in India during the previous plan period, the current five year plan aims at an ambitious 8% economic growth rate. Faster, more inclusive and more sustainable growth is to be achieved through a range of national economic (opening of the economy and removal of barriers to trade), agricultural (increasing productivity and profitability) and social programmes (focusing on basic services and welfare for poor and vulnerable groups including food security, employment, housing, vocational training etc.). Environmental sustainability is stressed with particular reference to effective natural resource management, enhancing soil health and productivity, organic agriculture and rational land use.</p>
Indian Forest Act (1927)	<p>This is the primary reference on GoI Forest Policy. The Act gives the State strong powers over forests and forestland (although strikingly without defining what forest actually is). Three categories of forest are defined – Reserved Forest, which is the most restricted category, protected forest and village forest. The Act defines forest products and forest offences and punishments.</p>
Wildlife Act (1972)	<p>The Act provides for the protection of wild animals, birds and plants; and for matters connected therewith or ancillary or incidental thereto. It has six schedules which give varying degrees of protection. Schedule I and part II of Schedule II provide absolute protection - offences under these are prescribed the highest penalties. Species listed in Schedule III and Schedule IV are also protected, but the penalties are much lower. Schedule V includes the animals which may be hunted. The plants in Schedule VI are prohibited from cultivation and planting. The hunting to the Enforcement authorities have the power to compound offences under this Schedule (i.e. they impose fines on the offenders).</p>
Forest Conservation Act (1980)	<p>Another primary piece of forest policy legislation introduced to check deforestation and conserve forests. The Act further strengthens the GoI's control over forests by restricting the use of forest land for non-forest purposes, and preventing the de-reservation of forests that have been reserved under the Indian Forest Act, 1927. Any clearance of forests requires GoI's clearance. However, in 1988 the Act was further amended to include two new provisions under Section 2, where it sought to restrict leasing of forest land to private individuals, authority, corporations not owned by the Government, and to prevent clear felling of naturally grown trees.</p>

Policy	Description/Main Provisions of Relevance
Forest Policy Uttaranchal (2001)	<p>Uttarakhand has modeled its forest policy as per the National Forest Policy of 1988. The state policy focuses on creating environmental stability, conservation of biodiversity, afforestation, fulfillment of village requirements, poverty alleviation and increasing people's participation in forestry.</p> <p>Major policy objectives:</p> <ul style="list-style-type: none"> ▪ To ensure environmental stability and ecological balance and for achieving this objective economic profits from the forests regarded as a secondary goal. ▪ To formulate and implement strategy for bio-diversity conservation and enhancement. ▪ To make available opportunities for local self-employment and poverty eradication. ▪ To strengthen the VP system, Joint Forest Management (JFM) and ecological development in order to enhance people's participation in forestry. <p>For implementation of this policy the formation of a 'State Forestry Board' was proposed with the Chief Minister as the Chairman of this board and the Chief Secretary as head of the Executive Committee.</p>
Biological Diversity Act (2002)	Covers conservation, use of biological resources and associated knowledge in India for commercial or research purposes or for the purposes of bio-utilization. The Act provides a framework for access to biological resources and benefit-sharing, as well as for intellectual property rights (IPRs) relating to Indian biological resources.
Forest Rights Act (2006)	The FRA concerns the rights of communities living in or near forests to land and resources. Many see the law as a policy measure to redress the "historical injustice" committed against forest dwellers, while including provisions for making conservation more effective and more transparent. The demand for the law has seen massive national demonstrations involving hundreds of thousands of people. The Act defines forest dwellers and the rights of people living in or depending on the area to be declared as a forest or protected area are to be settled.
National Forest Commission (2006)	<p>Major recommendations</p> <ul style="list-style-type: none"> ▪ The objectives of management for JF) need to be revised and clearly stated to broadly include restoration and development of degraded forest areas in order to meet demands for fuel wood, fodder and small timber and also to contribute towards poverty alleviation. ▪ Alternative sources of fuel, especially LPG connections, need to be provided to rural areas in and around forests. Solar energy also needs to be given a much greater impetus, especially in the mountainous and other areas.
National Environment Policy (2006)	<p>Major policy objectives</p> <ul style="list-style-type: none"> ▪ Conservation of critical environmental resources ▪ Livelihood security for the poor ▪ Inter-generational equity ▪ Integration of environmental concerns in economic and social development ▪ Efficiency in environmental resource use
Uttarakhand State VP Regulations	VP Rules 2005 enshrines the community rights over nearby forest to be managed by the community themselves. The regulations have been adjusted over time and now provide a detailed guiding framework for the management of village forests in Uttarakhand including policy provisions on the make-up of the VP Executive Committee, roles and responsibilities of particular individuals and arrangements between VPs and the Forest Department.
National Water Policy (2002) and	National Water Policy (2002) focuses on water resources development and management. Major policy objectives are:

Policy	Description/Main Provisions of Relevance
Uttarakhand Draft State Water Policy (2005)	<ul style="list-style-type: none"> ▪ Integrated natural resource management through a watershed approach. ▪ Empowerment of Panchayats to plan, construct and manage rural irrigation systems. ▪ Involvement of local communities in planning and implementation ▪ Planning processes to include traditional rights and systems ▪ Encouragement of private sector investment <p>Encouragement of traditional water mills and vesting their management with Panchayats. In line with the National Water Policy, the draft state water policy of Uttarakhand declares water as a basic human right; emphasizes on the need for conservation and development of water resources to achieve developmental goals (sustainable agriculture development, harnessing potential hydropower and industrial development); and envisages the participation of all tiers of Government in management and use of water resource. However, the policy also states that the local self-government institutions could modify water use priorities as per actual needs. The draft water policy also asserts that priority shall be given to rejuvenation of traditional water resources like <i>Naula, Dhara, Guls</i>, Ponds, etc.</p>
State policy for Harnessing Renewable Energy Sources (2008)	<p>Emphasis on harnessing non-polluting sources of energy useful for electrification of isolated and remote habitations in Uttarakhand.</p> <p>Major policy objectives</p> <ul style="list-style-type: none"> ▪ To harness environment friendly renewable energy resources and enhance their contribution to the socioeconomic development of the State. ▪ To meet and supplement minimum rural energy needs through sustainable RE projects. ▪ To provide decentralized energy supply to agriculture, industry, commercial and household sector. ▪ To enhance the use of energy sources that assist in mitigating environmental pollution.
India's National Action Plan on Climate Change (NAPCC/ 2008)	<p>The focus of NAPCC is on promoting understanding of climate change, adaptation, mitigation, energy efficiency and natural resource conservation while pursuing overall economic growth – i.e., measures that promote development objectives which also result in co-benefits for addressing climate change. There are 8 National Missions representing a “multi-pronged, long-term and integrated strategies for achieving key goals in the context of climate change: Solar Mission, Enhanced Energy Efficiency, Sustainable Habitats, Water, Sustaining the Himalayan Ecosystem, Green India, Sustainable Agriculture and Strategic Knowledge for Climate Change</p>
State Climate Change Council (2011)	<p>Formulated with the mandate of preparing, approving, implementing and monitoring a work plan for climate change in the state. (Order No. 37/X-3-2010-13(12)/2009 dated 11th January, 2011)</p> <p>The Council is chaired by the Chief Secretary, Government of Uttarakhand with the Forest and Rural Development Commissioner (FRDC) as the Vice-Chairperson and Additional Principal Chief Conservator of Forest (APCCF) Environment as the Member-Secretary. The Council has representatives belonging to 27 departments/institutions as its members.</p>
Uttarakhand State Action Plan on Climate Change (UAPCC/ 2012)	<p>In line with the National policy outlined above Uttarakhand State has developed a comprehensive policy planning document setting out strategic orientations for adapting to and mitigating climate change impacts across all sectors. Through the UAPCC, the State Government commits itself to fostering inclusive, sustainable, and climate resilient growth and development of the State. This vision will be achieved through (a) charting a low carbon growth strategy and climate resilient development model; (b) integration of climate concerns into all aspects of development policy and</p>

Policy	Description/Main Provisions of Relevance
	implementation, and (c) ensuring complementarity with and contributing to the national agenda on climate change.
Uttarakhand Water Management and Regulatory Act (2013)	<p>Establishment of a 5 member, Water Management Regulatory Authority which will ensure judicious and equitable management of water resources in the state as well as its proper allocation and optimal utilization.</p> <p>Major policy objectives:</p> <ul style="list-style-type: none"> ▪ The authority will have the powers of a civil court and the mandate to carry out developments in the state in an eco-friendly and sustainable manner. ▪ Formulating a new water policy to manage rivers, especially rivers that are causing damage to villages located on their banks. ▪ Fix rates for water use for industrial, drinking, power, agriculture and other purposes and on land benefited by flood protection and drainage works. <p>Monitor conservation of environment and facilitate the development of a framework for the preservation of quality of surface and ground water resources.</p>

Source: Compiled by JICA Preparatory Survey Team

2.5. Legal and Policy Framework for Environmental and Social Considerations in India and Uttarakhand

The table below outlines the key environmental and social safeguard policies, legislation and standards applicable in India and the State of Uttarakhand of relevance to the UFRMP.

Table 2.5.1 National and State Level Legal and Regulatory Framework for Environmental and Social Safeguards

No.	Legislation	Main Provisions	Relevance to the Project	Institutions Concerned
National Environmental and Social Safeguards Legislation				
A) Environmental/Forestry Policies and Legislation				
1	National Forest Policy 1988	Envisages 33% of the area of India should be under forest/tree cover through involvement of local communities in joint forest management programmes	UFRMP will promote participatory forest management by strengthening and implementing the project through the VPs.	Ministry of Environment and Forests, GoI State Forest Department VPs
2	Indian Forest Act (1878 and 1927)	Both the Acts sought to consolidate and reserve the areas having forest cover or significant wildlife, to regulate movement and transit of forest produce and duties for timber and other forest produce.	UFRMP as a project operating in forest areas needs to be in accordance with the primary legislation pertaining to forests in India.	Ministry of Environment and Forests, GoI State Forest Department
3	Forest Conservation Act (1980)	No part of a reserved forest land can be used for non-forest purpose without prior approval from the central government. Defines allowable use of	UFRMP activities must be in line with the provisions of this act vis-a-vis reforestation and development activities in forest areas.	Ministry of Environment and Forests, GoI State Forestry Department

No.	Legislation	Main Provisions	Relevance to the Project	Institutions Concerned
		Reserved Forest lands		
4	Wildlife Protection Act (1972)	Prohibits killing/trapping of wild animals Control of collection, protection, sale of specified plants Defines restrictions on access and use of protected areas Defines powers of prevention and detection of offences - arrest, seizure, penalties	UFRMP will address human-wildlife conflict and needs to do so in an appropriate manner UFRMP needs to ensure that endangered plant species are not further threatened by project activities UFRMP may work in protected areas and serve to strengthen restrictions on forest dependent communities	Ministry of Environment and Forests, GoI State Forestry Department State Wildlife Board Wildlife Wardens
5.	Biological Diversity Act (2002)	Covers conservation, use of biological resources and associated knowledge in India for commercial or research purposes or for the purposes of bio-utilization. Provides a framework for access to biological resources and benefit-sharing, as well as for intellectual property rights (IPRs) relating to Indian biological resources.	UFRMP will promote the utilization of certain biological resources and must ensure that applicable legislation on access and benefit sharing (ABS) and IPRs is applied.	National Biodiversity Authority State Biodiversity Board
6	Environmental Protection Act (1986)	Provide the protection of and improvement of environment (land, water and air) and related matters.	UFRMP's infrastructure development activities shall be implemented in accordance with Entry Point Activity (EPA) provisions.	Central Pollution Control Board, State Pollution Control Board
7	EIA Notification (2006)	Defines categorization schedule for activities/projects and procedures for Category A/B1 Projects	UFRMP shall develop criteria so that sub-projects shall not involve activities categorized as A/B1 and requiring EIA.	Relevant departments/agencies concerned with environmental clearances (Forest Department/State Pollution Control Board)
8	Water (Prevention & Control of Pollution) Act (1974)	Prevention and Control of water pollution and for the maintaining or restoring the wholesome of water.	UFRMP forestry activities would prevent undue siltation and enhance recharge the groundwater.	Ministry of Environment and Forests, GoI Ministry of Water Resources, Uttarakhand Jal Sansthan
9	Air (Prevention and Control of Pollution)	Prevention, control and abatement of air pollution in India.	UFRMP would soak more CO ₂ and address the climate change issues.	Ministry of Environment and Forests, GoI

No.	Legislation	Main Provisions	Relevance to the Project	Institutions Concerned
	Act (1981)			Central Pollution Control Board, State Pollution Control Board
B) National Social Policies and Legislation				
1	Land Acquisition Act (1894)	Allows government to acquire private lands for public purposes	UFRMP forestry and rural development activities shall avoid land acquisition.	Ministry of Rural Development, GoI and State Rural Development Department
2	National Resettlement and Rehabilitation Policy (2007)	Recognizes the rights of vulnerable groups such as SCs/STs and calls for minimizing involuntary resettlement and provision of adequate compensation	UFRMP shall avoid sub-projects involving involuntary resettlement	Ministry of Rural Development, GoI and State Rural Development Department
3	Scheduled Tribes and other Traditional Forest Dwellers (Forest Rights) Act (2006)	Concerns the rights of communities living in or near forests to land and resources. The rights of people living in or depending on the area to be declared as a forest or protected area are to be settled.	UFRMP shall fully respect the rights of forest dwellers in design and implementation of interventions.	Ministry of Environment and Forests, GoI State Forest Department District Collectorate.
4	Rights to Information Act (2005)	Mandates timely response to citizen requests for government information.	UFRMP shall respect the basic right of project affected peoples to information.	Ministry of Personnel, Public Grievances and Pensions State Information Commissioner
C) Environmental and Social Policies and Legislation Related to Uttarakhand State				
1	Uttarakhand VP Regulations (2005)	VP Rules 2005 enshrines the community rights over nearby forest to be managed by the community themselves.	Since UFRMP would be completely implemented in targeted VPs, it would be pertinent to support VPs in the State.	Ministry of Environment and Forests, GoI State Forest Department
2	Doon Valley Notification under EPA (1989)	Defines permissible and non-permissible activities and activities permissible with environmental clearance in Doon Valley	UFRMP may involve activities related to land use planning, tourism and grazing which are thus affected by this legislation in Doon Valley areas.	Ministry of Environment and Forests, GoI State Department of Tourism
3	Bhagirathi River from Gaumukh to Uttarkashi Eco-sensitive Zone (2012)	Declares towards the prohibition of ecological loss due to commissioning of hydro-power projects, cattle and human population, and anthropogenic pressure on Bhagirathi river ecosystem.	UFRMP will include activities in disaster affected and vulnerable parts of Uttarkashi. Activities (particularly any construction) will need to pay heed to this legislation.	Ministry of Environment and Forests, GoI

Source: Compiled by JICA Preparatory Survey Team

2.6. Development Plans and Projects

2.6.1 National and State Five – Year Plans 2012 – 2017

Planning Commission, GoI prepares five year plans to streamline the development activities in the country. The planning period of 12th Five-Year plan period is between 2012 and 2017. In addition, the state prepares its annual plan for different departments with budgetary outlay.

(1) National 12th Five-Year Plan

The broad vision and aspirations which the 12th Plan seeks to fulfill are reflected in the subtitle: 'Faster, Sustainable, and More Inclusive Growth'. The 12th plan has projected to achieve 9 % GDP growth rate during 2012-17.

Table 2.6.1 National Growth Figures

Indicator	11 th Plan (2007 to 2011)	12 th Plan (2012 to 2017)
GDP growth	7.6%	9 %
Agriculture growth (Agriculture, Forestry and Fisheries)	3.7%	4%
Bellow Poverty Line (BPL) decline rate	1.5%	10%
Manufacturing sector growth rate	2.7%	7%
Infant Mortality Rate (per thousand)	41	25
Increase in green Cover	-	1 million ha per year

Source: 12th Five-Year Plan (2012–2017), *Faster, More Inclusive and Sustainable Growth*, Volume I & Volume II, Planning Commission, Government of India (2013).

Poverty reduction remains an important policy focus in the 12th plan. Budget allocation for achieving proposed growth has been paid due emphasis by the GoI during the 12th Five-Year plan.

Table 2.6.2 Budgetary allocations for National 12th five year plan

Sector	% of GDP in 11 th Plan	% of GDP in 12 th Plan
Agriculture and water resource supply sector	7.33	7.96
Rural Development and Panchayati Raj	25.01	18.86
Health and child development	7.09	11.45

Source: 12th Five-Year Plan (2012–2017), *Faster, More Inclusive and Sustainable Growth*, Volume II, Planning Commission, Government of India (2013).

12th Five-Year plan has identified that the greatest potential for improving productivity is in the rain-fed areas, which account for 55 % of the net sown area and where most of the poor live. The plan mandates the increase in the Gross Irrigated Area from 90 million hectare to 103 million hectare by the end of the planned period. 12th Five -Year Plan also plans to connect all villages with all-weather roads; to achieve environmentally sound and sustainable development; to increase in green cover (as measured by satellite imagery) by 1 million hectare every year during the planned period. Agriculture and forestry sector growth rate has been projected to an average of 4 %.

(2) Uttarakhand 12th Five-Year Plan (2012 – 2017) and Annual Plan 2012 -2013

The annual plan for 2012-13 proposed an outlay of INR 99.97 billion inclusive of the special central assistance of INR 41.85 billion. It addresses the need for “proper valuation” of eco-services given the contribution of the state in maintaining the ecological balance in the country. It also points out the heavy economic burden levied on the state finance by the compensatory afforestation, which reflects the rapid developmental activities which incur the land conversion.

2.6.2 Other Key Development Plans

(1) Uttarakhand State Perspective and Strategic Plan (USPSP) 2009-2027

USPSP was developed by Watershed Management Directorate with the main objective to increase the productivity and income of the rural inhabitants in the rain fed micro-watersheds of the State on priority basis through sustainable management of the natural resources.

The perspective plan has three components:

- A) Participatory Watershed Development and Management,
- B) Enhancing Livelihood Opportunities,
- C) Institutional Strengthening and promotion of economic/livelihood activities.

Agriculture, livestock and related activities are the main source of livelihood for the proposed target area of watershed, therefore given due emphasis for watershed development activities in the plan. USPSP has also planned to reduce the emphasis on traditional crops and proposed to increase prominence on high value crop and value addition through grading, packaging, processing and encouraging organic farming.

USPSP has also emphasized on convergence with schemes/ projects of the various Line Departments like Forest, Agriculture, Rural Development and externally aided project working on Watershed Guidelines.

(2) Uttarakhand Tourism Development Master Plan 2007-2022

With the support of UNDP, World Tourism Organization and GoI, the Uttarakhand Tourism Development Master Plan was prepared. The Master Plan proposes 6 key projects to develop the tourism in the state as listed below:

- a. Development of Dehradun-Mussoorie Tourism circuit
- b. Development of Pilgrim circuit at Reetha Sahib and Nanak Matta
- c. Development of Ghangaria – Valley of Flowers – Hemkund Sahib as a Tourist Circuit
- d. Development of Corbett National Park as a Tourist Circuit
- e. Development of Dhanolti-Chamba-Narendra Nagar Tourist Circuit
- f. Development of Munsiyari as a Destination in Uttarakhand

The implementation of above project has been partially supported by the Asian Development Bank (ADB), and ADB pledged to support the recovery of damaged tourism infrastructure after the recent natural disaster in June 2013.

2.7. Development Projects

(1) Externally Funded Projects

Many programmes have been implemented till date with the funding of the external sources and GoI. The projects in the watershed management, livelihood development and environment are summarized as below. A comprehensive list of relevant projects is given in **Attachment 2.7.1**, and the map showing the micro watersheds covered under various schemes are shown in **Attachment 2.7.2**.

Table 2.7.1 Key Projects and programs in Uttarakhand (Externally Funded)

Project/ Program	Name of Implementing Agency	Name of Supporting agency	Current Status of the project.
Uttarakhand Livelihood Improvement in Himalayas (ULIPH)	Uttarakhand Gramya Vikas Samiti (UGVS)	IFAD & GoI	Completed in 2013
Integrated Livelihood Support Project (ILSP)	UGVS and Watershed Management Directorate (WMD)	IFAD & GoI	Launching in 2013
Uttarakhand Decentralized Watershed Development Project (UDWDP/ GRAMYA)	WMD	World Bank	Phase-I completed in 2012
UDWDP (GRAMYA-Phase 2)	WMD	World Bank	Phase – II proposed
Sustainable Land and Ecosystem Management (SLEM) project	WMD	Global Environment Facility (GEF) project	2009-2013

Source: JICA Preparatory Survey Team.

(2) Programs/ Schemes Funded by State Government and GoI

State Government has different programs/ schemes to cater for services in the areas of health, education, agriculture, horticulture development, medicinal plant promotion and so on. Some Key programs/ schemes are listed below.

Table 2.7.2 Key Programs and Schemes in Uttarakhand (funded by State and Central Government)

Name of the Program	Nodal Agency	Duration of the program	Coverage districts	Financing mechanism
Mahatma Gandhi National Rural Employment Guarantee	Department of Rural Development (DRD)	2006- Current	All districts	100% cost of labor and 75% cost of material GoI and 25% cost of material by Government of Uttarakhand (GOUK)
Integrated Watershed Management Program	WMD	2010-2028	All districts in Phased manner	100 % GoI, Ministry of Land Resources
Pradhan Mantri Gram Sadak Yojna (PMGSY)	DRD	2000- Current	All district	100% GoI
Rastriya Krishi Vikas Yojna	Department of Agriculture (DOA)	2007-Current	-	100 % GoI
Off Season Vegetables and spice program for Scheduled Tribal areas	Department of Horticulture (DOH)	Current	All	GOUK
Processing and value addition of fruit and vegetables	DOH	Current	All	GOUK

Name of the Program	Nodal Agency	Duration of the program	Coverage districts	Financing mechanism
National Rural Livelihood Mission (NRLM)	DRD	2011 (2013 In Uttarakhand)	In process	75% GoI and 25% GOUK
Rastriya Swasthya Bima Yojna (National Health Insurance Scheme).	GoI & Department of Health and Family Welfare (DHFV)	2008-Current	All	75 %GoI and 25% GOUK and beneficiary

Source: JICA Preparatory Survey Team.

(3) Programs/ Schemes for Forestry Sector/ Watershed Development

Recently implemented or soon-to- be implemented projects in Forestry Sector/ Watershed Development are summarized below.

Table 2.7.3 Forestry / Watershed Development Projects in Uttarakhand

Implementing/ Nodal Agency	Program	Funding Sources	Number of districts/ divisions	Implementation Period	Current Status
JICA	PCBSFTI-SFSC*	JICA	CASFOS – Dehradun/ All India	2009 - 2014	On-going
JICA	CDFMPT**	JICA	Uttarakhand and 9 other states	2008 - 2013	On-going
WMD	UDWDP (Gramya-I)	World Bank (WB)	11 Districts	2004-2012	Completed
	Integrated Livelihood Support Project (ILSP)	IFAD	6 Districts	2013-2019	Planning in process.
	UDWDP (Gramya-II)	WB	Selection in progress	2013-	To be implemented
Department of Land Resources (DLR)	Integrated Watershed Management Project (IWMP)	GoI	All Districts	2010-2028	Ongoing
Forest Development Agency (FDA)/ UKFD	National Afforestation Program (NAP)	GoI	All Forest Divisions	2001	Ongoing
Compensatory Afforestation Fund Managements and Planning Authority (CAMPA)/ UKFD	CAMPA	GoI	All forest Divisions	2009	Ongoing
Uttarakhand Bamboo and Fiber Board (UBFDB)	Uttarakhand Bamboo Craft, Revitalization & Diversification Programme for Livelihood & Ecological Restoration	Social Welfare Department	18 Forest Divisions	2006-7 to 209-10	Completed

	under Component (UBRDP)	Special Plan				
--	-------------------------------	-----------------	--	--	--	--

* JICA Project for Capacity Building of State Forest Training Institutions and SFS (State Forest Service) Colleges

** JICA Capacity Development for Forest Management and Personnel Training Project

Source: Compiled from various project documents. (JICA Preparatory Survey Team)

JICA is amongst the donor agencies supporting Forestry Sector in Uttarakhand as well as that of India as a whole. Their operational areas are presented in the map shown in **Attachment 2.7.2** and **2.7.3**

Amongst the foreign donor agencies, the World Bank has supported the forestry project in Uttarakhand since the time it was still part of Uttar Pradesh. Those projects were Social Forestry Project (1979/ 80 – 1992/93) and Uttar Pradesh Forestry Project (1998 – 2003). The former has made an attempt to institutionalize community participation, while the latter emphasize on the capacity development of Forest Department in the four aspects of 1) Institutional Development, 2) Forest Development, 3) Research and Technology and 4) Biodiversity conservation. The summary of the two projects is given below.

Table 2.7.4 An overview of the Uttar Pradesh Forestry Project funded by the World Bank

Item	Description
Implementation Period: 1998 – 2003	Loan Amount: 52.94 million USD equivalent
Objectives: To assist Forest Department to implement the government strategy for forestry sector development in the State	Project Area: All areas of Uttar Pradesh and Uttaranchal
Components:	Key activities
Outcome Rating	Satisfactory
Institutional Development (12.75 million USD/ 19%)	<ul style="list-style-type: none"> ✓ Capacity development/ training for enhanced management system ✓ Introduction of improved forest management planning, monitoring and evaluation and environmental analysis procedures ✓ Introduction of forest management information system
Forest Development (39.75 million USD/ 61%)	<ul style="list-style-type: none"> ✓ Promotion of natural forest regeneration through enrichment planting, improved silvicultural practices and forest floor management in dense forest areas ✓ Introduction of JFM and village Forest Committees ✓ Improve community, urban and farm forestry ✓ Development and implementation of fires and grazing management strategies; industrial plantations; and strip plantations along roads with participation of community
Research and Technology (3.88 million USD/ 6%)	<ul style="list-style-type: none"> ✓ Improvements in plant reproductive technologies and NTFPs ✓ Provision of necessary equipment and training to develop linkages with research databases ✓ Introduction of Planting material improvement program ✓ Development of seed handling facilities and research nurseries
Biodiversity Conservation (8.81 million USD/ 14%)	<ul style="list-style-type: none"> ✓ Long term strategic planning for biodiversity conservation with adaptation of cluster approach to biodiversity conservation ✓ Introduction of protected area management through community participation by establishing Eco Development Committees (EDCs) in the fringe areas ✓ Research activities

Source: Implementation Completion Report (IDA-30180) for the Uttar Pradesh and Uttaranchal Forestry Project. (22 Jan 2004). World Bank; Washington DC.

2.8. Climate Change Trends and Impacts in Uttarakhand

Climate change models for the Hindu Kush Himalayas (HKH) indicate that this is one of the most vulnerable regions in the world to the impacts of global climate change. It has been documented that the rates of warming in the HKH region are significantly higher than the global average and that the warming is occurring at much higher rates in the high-altitude regions than in the low-altitude regions (Shrestha et al, 1999⁹) and that this rapid warming is leading to significant glacial retreat (Dyurgaev & Meier, 2005¹⁰).

The latest model projections (Kulkarni *et al.*, 2013¹¹) indicate significant warming will occur throughout the HKH region toward the end of the 21st century. The annual temperature range is forecasted to increase from 1.7°C to 2.2°C with respect to the 1970's. Seasonal air temperatures are also forecasted to rise in all seasons. However, winter temperatures during October-December are likely to decrease by 2.6°C in 2030's with respect to 1970's (Uttarakhand State Action Plan on Climate Change, 2012).

In terms of precipitation, in the short term rainfall is expected to be reduced by 15-50% during October- December and monsoon rainfall may decrease over the Central Himalayas (including Uttarakhand) between 2011 and 2040 (although there may be a 5–10% increase in rainfall in the Eastern and Western Himalayas). However, longer term climate modeling for the Himalayan region indicate that rainfall in all seasons is likely to increase by 5-13%. The Kulkarni *et al* (2013) model overleaf shows transition to an increase in monsoon rainfall of around 5-20% in Uttarakhand, northern parts of Uttarakhand may experience much bigger increases in monsoon precipitation. Furthermore, the rising incidence of extreme precipitation events increases the potential risks of major flash-flooding and landslide events such as those experienced in June 2013 in Uttarakhand.

Climate change modeling data is also supported by the lived experience of mountain peoples in Uttarakhand who currently report the following trends (In ICIMOD, 2011¹² and Jain, in press¹³):

- Overall less rainfall, and more erratic
- Overall decreased water availability
- Less or absent winter rains
- Increased frequency of intense rainfall events
- Increase in pests and disease
- Increasing temperatures
- Warmer and shorter winters with less snowfall (although the winter of 2011-2012 seemed to be an aberration, with extreme cold weather and excessive snowfall)

In addition to the increased threat of major hazard events during the monsoon season, the combined effects of rising temperatures and the loss of ice and snow in the region are already affecting water availability (amount and seasonality)¹⁴, biodiversity (survival of endemic species and predator–prey relations), ecosystem boundaries (tree line movements and high-elevation ecosystem changes), and

⁹ Shrestha AB, Wake CP, Mayewski PA, Dibb JE. 1999. Maximum temperature trends in the Himalaya and its vicinity: An analysis based on the temperature records from Nepal for the period 1971–94. *Journal of Climate* 12(9):2775– 2786.

¹⁰ Dyurgerov MD, Meier MF. 2005. *Glaciers and Changing Earth System: A 2004 Snapshot*. Boulder, CO: Institute of Arctic and Alpine Research, University of Colorado.

¹¹ Kulkarni, A., Patwardhan, S., Kumar, K.K., Ashok K., & Krishnan, R. 2013. Projected Climate Change in the Hindu Kush–Himalayan Region By Using the High-resolution Regional Climate Model PRECIS. *Mountain Research and Development*, 33(2):142-151. 2013. Mountain Research Society.

¹² ICIMOD, 2011. *Climate Variability and Change in the Himalayas: Community perceptions and responses*. Kathmandu, Nepal, 2011

¹³ Jain, A. In Press. *Community-based Vulnerability and Capacity Assessments to Climate Change: A case study of Uttarakhand, India*. ICIMOD.

¹⁴ A specific study on the Lakhwar sub-basin in the upper watershed of the Yamuna River in Uttarakhand indicated that total surface run-off will likely decrease leading to water stress and declining crop yields. Kelkar, U., Narula K.K., Sharma V.P. & Chandna, U. 2008. *Vulnerability and Adaptation to Climate Variability and Water Stress in Uttarakhand State, India*. *Global Environmental Change* 18 (2008) 564–574. Elsevier.

global feedbacks (monsoonal shifts and loss of soil carbon) (Xu *et al* 2009¹⁵). Specifically in Uttarakhand, both Jain (in press) and Kelkar (2008) identify significant adverse impacts on livelihoods in terms of reduced agricultural productivity, reduced farm labor opportunities, reduced incomes from farming and dairying, shifts to off-farm labor, and out-migration.

2.9. Natural Disaster in Uttarakhand

Uttarakhand borders Tibet to the north, Nepal to the east, and the states of Himachal Pradesh and Uttar Pradesh in the west and south respectively. The region is traditionally referred to as Uttarakhand in Hindu scriptures and old literature, a term which derives from the Sanskrit for Northern Country or Section. Uttarakhand by virtue of its geographical is vulnerable to minor ecological changes. Hence any activity disapproved by mountain ecosystem triggers a disaster.

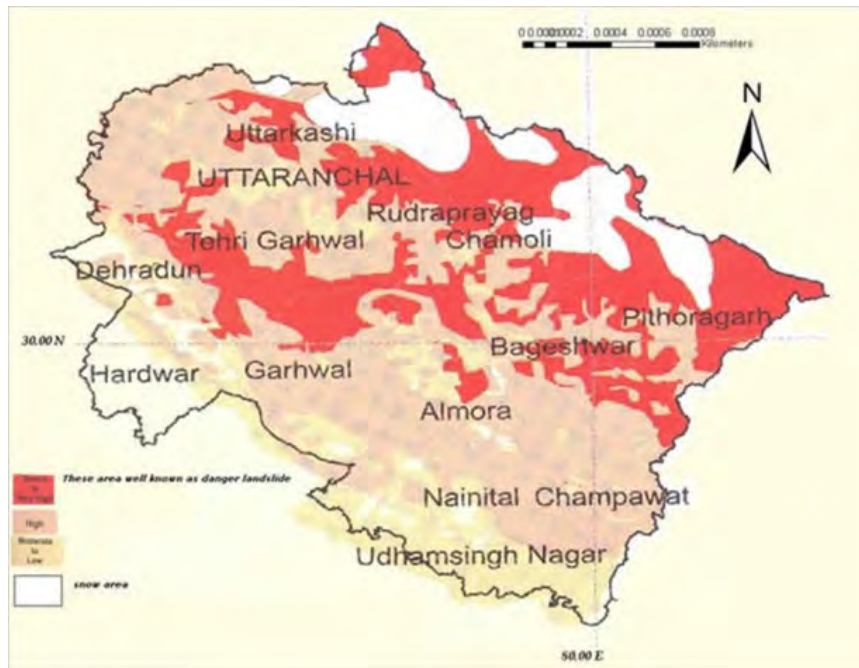
At the national level, National Disaster Management Authority (NDMA) has been constituted as an apex body to lay down the policies, plans and guidelines for Disaster Management to ensure timely and effective response to disasters. Towards this, it has the following responsibilities;

- Lay down policies on disaster management ;
- Approve the National Plan;
- Approve plans prepared by the Ministries or Departments of the GoI in accordance with the National Plan;
- Lay down guidelines to be followed by the State Authorities in drawing up the State Plan;
- Lay down guidelines to be followed by the different Ministries or Departments of the GoI for the purpose of integrating the measures for prevention of disaster or the mitigation of its effects in their development plans and projects;
- Coordinate the enforcement and implementation of the policy and plan for disaster management;
- Recommend provision of funds for the purpose of mitigation;
- Provide such support to other countries affected by major disasters as may be determined by the Central Government;
- Take such other measures for the prevention of disaster, or the mitigation, or preparedness and capacity building for dealing with the threatening disaster situation or disaster as it may consider necessary;
- Lay down broad policies and guidelines for the functioning of the National Institute of Disaster Management.

Department of Disaster Management Government of Uttarakhand and Disaster Mitigation and Management Centre (DMMC) is the apex center in the field of Disaster Mitigation and Management in Uttarakhand, with an aim to protect the community and the environment from the over whelming obliteration caused by disasters.

The objectives of DMMC, located in the Uttarakhand secretariat compound, are to generate the sense of worth amongst common people and the government authorities in formulating appropriate policies and to strengthen their capabilities to cope up with all aspects of disaster management.

¹⁵ Xu J, Grumbine RE, Shrestha AB, Eriksson M, Yang X, Wang Y, Wilkes A. 2009. *The Melting Himalayas: Cascading effects of climate change on water, biodiversity, and livelihoods*. Conservation Biology 23:520–530.



Source: <http://dmmc.uk.gov.in/pages/display/96-landslide-zone>

Figure 2.9.1 Flood and Landslide Hazard Map of Uttarakhand

The detailed report on Disaster mitigation is given as **Volume II** of this Report.

Chapter 3 PROJECT AREA

3.1 Target Project Areas

After a series of discussions with the Uttarakhand Forest Department, JICA Preparatory Survey adopted the following criteria for target project areas to come up with a recommendation on target project areas:

Criteria for Prioritization

- a. Extent of degraded forests (Scrub, Open Forest, Moderately Dense Forest as per the classifications by the Forest Survey of India (FSI) for the forest crown densities) outside the Reserved Forests

Criteria for Exclusion from the Priority

- b. Inadequacy of Van Panchayat (VP)
- c. Geographical incontinuity
- d. Existence of other major programs and projects in the watershed/ forestry sector in the range
- e. 4th and below ranges in one Division based on the priority criteria
- f. Other administrative aspects (display effect, more than 2 priority ranges in one division, reasonable accessibility/ elevation)

In view of the main project objective, which is to contribute to eco-restoration and forest resource development through VP, the extent of degraded forests outside the Reserved Forests was adopted as the main criteria for the selection of target project areas. The process of analysis on the target project area selection is illustrated below:

- a. Adopted a forest range as a unit for target project area selection
- b. Prioritized so called “non-territorial forest divisions”, such as Soil Conservation Divisions, Civil & Soyam (CS) Divisions and Dam Divisions and their ranges, while the main project approach for rehabilitation of degraded forests was to capacity building of VP. Wherever no non-territorial divisions exist, territorial divisions are taken into consideration for analysis.
- c. Analyzed the size of degraded forests outside the Reserved Forests within each range using the range boundary data and Reserved Forest boundary data with the GIS laboratory of Uttarakhand Forest Department, as well as the crown density map of India Status of Forest Report (ISFR) 2011 (the satellite images used by ISFR of 2011 were acquired in 2008-09).
- d. Identified priority ranges with more than 4,000 ha of degraded forests outside the Reserved Forests (Nailchami Dam Range in Tehri Dam I Division was included because it had a large degraded forests with the Reserved Forest, which was deemed inappropriate to ignore)
- e. Excluded divisions with only one priority ranges (Agastmuni Range at Rudraprayag Territorial Range and Jalkur Gad Range – II at Uttarkashi Soil Conservation Division II)
- f. Excluded 7 ranges with major watershed projects
- g. Excluded 4 priority ranges with large areas of very high altitudes
- h. Excluded 6 ranges below 4th ranks in one Division in terms of size of degraded forests
- i. Included Mussoorie Range and Rapur Range in Mussoorie Territorial Division for its display effect
- j. Included 3 additional ranges for Ranikhet Soil Conservation Division, Ramnagar Soil Conservation Division and Narendra Nagar Territorial Division to balance the volume of work

As a result, 37 priority ranges were selected as listed in **Section 6.4**, and the map of priority ranges is in **Attachment 3.1.1**.

These 37 priority ranges fall under 13 forest divisions as indicated in the table below:

Table 3.1.1 Selected Project Divisions

	Recommendation by JICA Survey Team	Priority Range	Circle		Originally Proposed by UKFD	Circle
Non-Territorial Divisions				Non-Territorial Divisions		
1	SC* Lansdown	3	Shivalik	1	SC* Lansdown	Shivalik
2	SC* Nainital	3	South Kumaon	2	SC* Nainital	South Kumaon
3	SC* Ramnagar	3	South Kumaon	3	SC* Ramnagar	South Kumaon
4	SC* Ranikhet	3	South Kumaon	4	SC* Ranikhet	South Kumaon
5	Tehri Dam I	2	Bhagirathi	5	Tehri Dam I	Bhagirathi
6	SC* Alaknanda	3	Garhwal			
7	CS Pauri	3	Garhwal	6	CS Pauri	Garhwal
8	CS Almora	3	North Kumaon	7	CS Almora	North Kumaon
				8	SC* Uttarakhashi	Bhagirathi
				9	Tehri Dam II	Bhagirathi
	TOTAL	23				
Territorial Divisions				Territorial Divisions		
9	Bageshwar	3	North Kumaon	10	Bageshwar	North Kumaon
10	Champawat	3	North Kumaon	11	Champawat	North Kumaon
11	Mussoorie	2	Yamna	12	Mussoorie	Yamna
12	Pithoragarh	3	North Kumaon			
13	Narendranagar	3	Bhagirathi			
				13	Dehradun Territorial	Shivalik
	TOTAL	14				
	GRAND TOTAL	37				

*SC: Soil Conservation Division
Source: JICA Preparatory Survey Team

The 37 priority ranges fall under 8 districts, namely Bageshwar, Pithoragarh, Almora, Chamoli, Champawat, Nainital, Tehri Garhwal, Garhwal and Dehradun. A list of Districts and Sub- Districts, to which the selected priority ranges belong to, is shown in **Attachment 3.1.2**

For the Erosion Control and Sediment Disaster Mitigation Component under the project, it was decided to target the areas that are most affected by the recent disaster of June 2013. Five particular divisions were most affected by the recent disaster, and 6 forest divisions cover those 5 districts, namely:

- a. Uttarakhashi Soil Conservation Division (Non-Territorial)
- b. Uttarakhashi Forest Division (Territorial)
- c. Rudraprayag Forest Division (Territorial)
- d. Badrinath Forest Division (Territorial)
- e. Bageshwar Forest Division (Territorial)
- f. Pithoragarh Forest Division (Territorial)

For the map of 6 target divisions above, see **Attachment 3.1.3**.

3.2 Forests and Forestland

3.2.1 Forest Cover, Forest Type, Eco-Climatic Zones and Present Land Use

(1) Forest Cover

A map and detailed division-wise distribution of Reserved Forest is given in **Attachment 3.2.1** and **Attachment 3.2.2**.

(2) Forest Type

According to the Revised Forest Types of India by Champion & Seth (1968), the forests of Uttarakhand represent 34 Forest Types which belongs to eight major groups, and a map and division-wise details of these Forest Types are given in **Attachment 3.2.3**.

(3) Eco-Climatic Zones

Considering the varying climatic conditions and type of vegetation along the altitudinal ranges, the geographical area of Uttarakhand has been classified in to the following eco-climatic zones:

Sub-Tropical (<1,000m altitude): This zone is dominated with sal and associated forests and represents Tropical Moist Deciduous and Tropical Dry Deciduous Forest Types.

Warm Temperate (1,000-1,500m altitude): Dominated with Chir pine forests and represents Sub Tropical pine Forest Type.

Cool Temperate (1,500-2,500m altitude): Oak and deodar-blue pine forests are the main forest cover of this zone and represents Himalayan Moist Temperate and Himalayan Dry Temperate Forests.

Sub-Alpine (2,500-3,500m altitude): Betula, Rhododendron (high altitude) and silver fir are the main species of this zone and represents Sub-Alpine Forest Type.

Alpine (3,500-5,500m altitude): Betula, Rhododendron scrub, Junipers, Berberis and Cotoneaster scrubs are the main vegetation and represents Moist Alpine & Dry Alpine Scrub Forest Types. This Zone also has large areas under alpine meadows (locally known as “Bughals”).

An elevation map is given in **Attachment 3.2.4**.

3.2.2 Forest Species and NTFPs

Uttarakhand is well known for its floral and faunal biodiversity. The temperate broad leaf mix forest has the highest tree and herb diversity while the pine mixed forest has the highest shrub diversity. The important species found in the Tropical Moist Deciduous forest are *Adina cordifolia*, *Anogeissus latifolia*, *Shorea robusta*, *Terminalia tormentosa* and bamboo. The species in Tropical Dry Deciduous forest are *A. latifolia*, *Shorea robusta* and *T. tormentosa*. Pines are the dominant species in Sub Tropical Pine forests of the state. Coniferous species like *Abies pindrow*, *Betula spp.*, *Cedrus deodar*, *Picea smithiana*, *Quercus spp* etc. are available in Himalayan Moist temperate forest. In Himalayan Dry Temperate forest the common species found are *Dendrus deodar*, *Juniperus spp.* and *Pinus wallichiana*. *Abies* and *Betula spp.* are seen in Sub-Alpine forest including large patches of Alpine grassland called Bughals. In the Moist Alpine Shrub forests one can find *Betula utilis* and *Rhododendron campanulatum*. *Juniperus*, *Artemisia* and *Primula spp.* are found in Dry Alpine Shrub forests.

The occurrence of bamboo in Uttarakhand is limited and 8 nos. of bamboo species (including ringal) representing 5 genera occur naturally in Uttarakhand. 95 species of fiber yielding plants are recorded from Uttarakhand and major fiber species include Bhimal and Himalayan nettle. 701 species of medicinal plants occur naturally in state and these species are distributed at all elevations in Uttarakhand although their occurrence is higher in higher elevations.

Uttarakhand has a vast diversity of lichens comprising of 560 species dominated by foliose lichens (305 species) followed by crustose (193 spp.) and fruticose (83 spp.).

Table 3.2.1 Major tree species in Uttarakhand

Name of species	Estimated growing stock (‘000’ cubic metres)	Total area (ha)
Chir Pine	153,842	393,384
Oak	11,477	383,088
Sal	47,112	313,054
Fir and spruce	9,410	92,465
Deodar	3,386	18,783

Source: Uttarakhand Forest Statistics, 2011-12

Table 3.2.2 Bamboo, Fiber and MAP species in Uttarakhand

	No. of species	Major species
Bamboo and ringal	8 species 139,400 ha area and 45,000 m ³ growing stock	<i>Dendrocalamus strictus</i> , <i>D. hamiltoni</i> , <i>Bambusa bambos</i> , <i>Arundinaria falcata</i> , <i>A. jaunsarensis</i> , <i>Thamnocalamus spathiflorus</i> , <i>T. falconeri</i> .
Fiber	95 species	Bhimal (<i>Grewia optiva</i>) and Himalayan nettle (<i>Gerardiana heterophylla/ diversifolia</i> and <i>Urtica dioica</i>)
Medicinal and Aromatic plants	701 species occurring naturally including 135 tree species, 138 shrub species and 421 herb species	Atis (<i>Aconitum heterophyllum</i>), Kuth (<i>Saussurea costus</i>), Kutki (<i>Picrorhiza kurrooa</i>), Jatamansi (<i>Nordostachys jatamansi</i>), Chirayata (<i>Swertia chirayata</i>), Sarpagandha (<i>Rauvolfia serpentina</i>), Satawar (<i>Asparagus racemosus</i>), Majisth (<i>Rubia cordifolia</i>), Chamomile (<i>Matricaria chamomilla</i>), Tejpat (<i>Cinnamomum tamala</i>)
Lichens	560 species under 212 genera and 42 families	<i>Parmotrema</i> , <i>Everniastrum</i> , <i>Ramalina</i> and <i>Usnea</i> are major species of commercial importance

Source:

1. Uttarakhand State of the Environment Report 2012, Uttarakhand State Council for Science and Technology, Uttarakhand Science Education and Research Centre, Dehradun.
2. Nayaka, S., D.K. Upreti and Himanshu Rai (2011) An outline of Lichen diversity in Uttarakhand, India. Poster presented at 6th Uttarakhand State Science and Technology Congress, Uttarakhand State Council for Science and Technology, Dehradun.

3.2.3 Utilization of Forest Resources/ Forest Dependency by Forest Dwellers

The forests, alpine meadows, glaciers and snow peaks of Uttarakhand provide a range of ecological services estimated by various studies to be between INR250-400 billion per annum. 80 per cent of the people in Uttarakhand live in and around forests and depend on variety of forest produce such as timber, fuel wood, fodder, fiber, medicines and other NTFPs for their domestic use and also for partial cash income. Timber and fuel wood form the major forest produce in Uttarakhand although there is a huge potential for NTFP and medicinal plant products. More than 100 varieties of NTFPs were being traded earlier and now the Government has restricted the harvesting of 34 species from the forest.

The rural people mainly depend on the fuel wood and tree based fodder as availability of fuel wood and fodder from the agriculture land is very limited. The domesticated animals largely graze in the forest. It is evident from the records of Uttarakhand Livestock Census that there is fodder shortage of 9.3 million tons. Similarly there is also shortage of fuel wood in the hills. The estimated annual fuel wood production is 0.05 million cum. The annual wood production from the forest is 0.250 million cum. Between 2005 and 2011 the timber production has declined from 331,319 cum to 201,900 cum as well as the fuel wood production from 62,592 cum to 26,610 cum (Uttarakhand: State of the Environment Report, 2012). The fuel wood consumption varies from place to place and also the average per capita consumption of fuel wood varies from season to season. Different studies carried out during 1990s have highlighted that the per capita consumption of fuel wood varies from 1 kg per

day to even 7.5 kg per day. Especially in the hills, the demand for fuel wood during winter season is extremely high to keep the house warm.

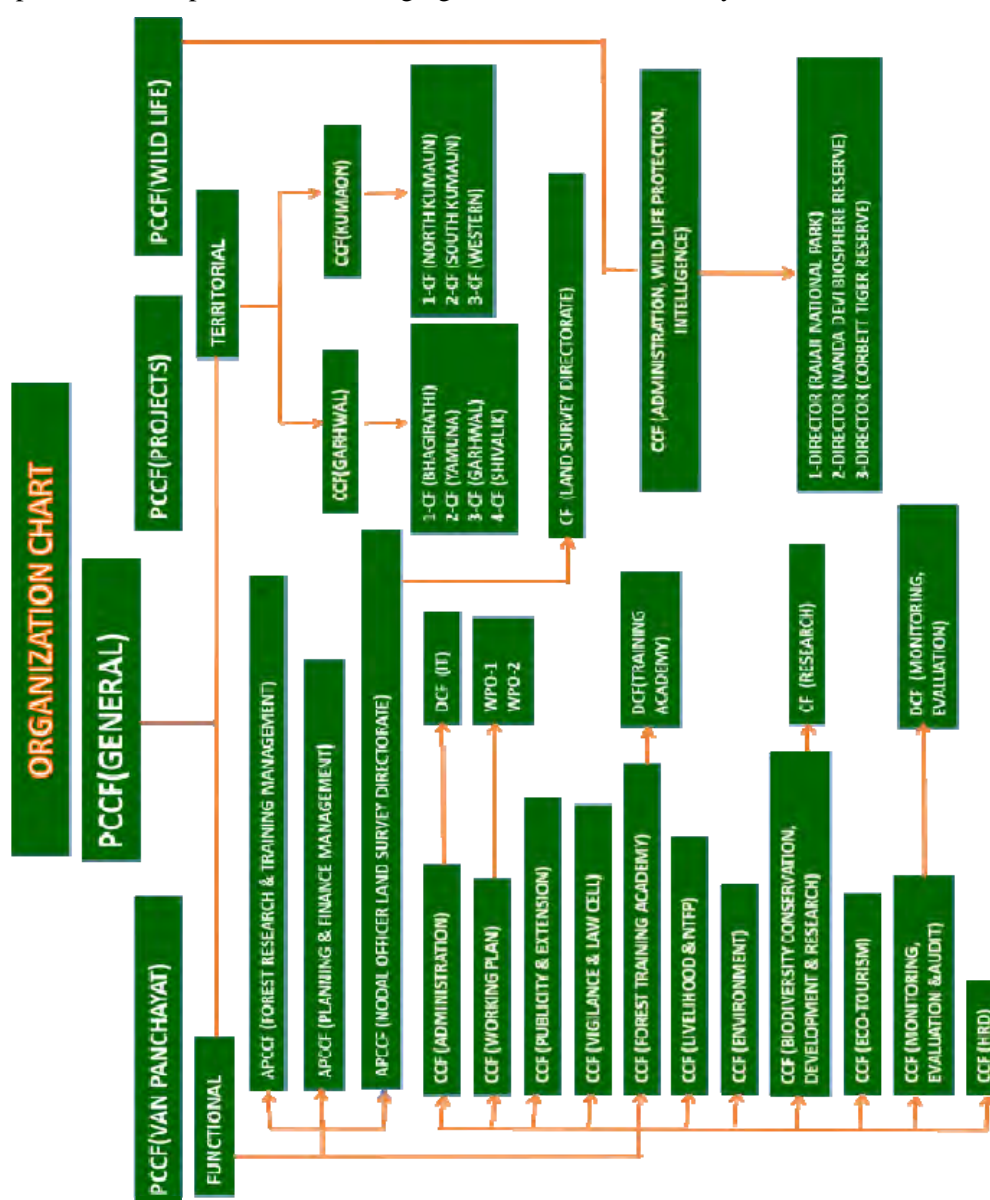
There are 451 artisan villages who subsist on income made out of preparation of products from bamboo and ringal. Their major source of raw material is forest. Some of the important NTFPs collected and sold by the local population are lichens, moss grass, tejpatta, knots of Chir Pine trees etc.

There are two paper mills (one each in Uttar Pradesh and Uttarakhand) that make use of the Eucalyptus timber. There are 174 pine resin processing units in the state, of which 98 are functional. There are 334 saw mills and 33 plywood and veneer units in the state but information on their function and utilization of forest produces is not readily available.

3.3 Forest Administration and Capacity

3.3.1 Overview and Structure of Forest Department and its Affiliates

Forest Department is responsible for managing forests and biodiversity in the state.



Source: Uttarakhand Forest Department

Figure 3.3.1 Structure of Forest Department and its Affiliates

3.3.2 Forest Administration and Management per Various Forestland Classifications and Functions

The forestland classifications and their descriptions and management are summarized in the table below:

Table 3.3.1 Forestland Classification and Description/ Management

Forestland Type	Description	Management	Broad Management Objective
Reserved Forest (RF)	RF includes: <ul style="list-style-type: none"> ✓ Old reserves notified as RF before 1911 ✓ Class II reserved forests notified between 1911 and 1917 in the old Kumaon area ✓ Part of Class I forests in the old Kumaon area that were transferred in 1964 to the Forest Department ✓ Class I reserved forests notified in 1897 in the old Tehri State ✓ Former Sal forests owned by Zamindari (local large landowners) that were gradually notified before and after the independence 	Under the control of Forest Department	<ul style="list-style-type: none"> ✓ Originally, to meet mainly the timber demand ✓ Lately, to ensure various ecological services, such as water source protection, soil conservation, slope stabilization, biodiversity conservation, carbon sequestration, etc.
VP (Village Forest)	VP includes: <ul style="list-style-type: none"> ✓ Part of Class I forests notified in 1921 by the “Kumaun Forest Grievances Committee.” ✓ Part of old reserved forests in the old Kumaon area under the notification of 1893, which were notified as VP in 1921 ✓ Former Zamindari forests that were left un-notified as reserved forests (known as “Khat forests”) and later notified as VP ✓ Recently, especially after 2001 revised VP Act, many small patches of CI & Soyam Forests were notified as VP (drastic increase of the number of VP). 	Exclusive use by the villagers, although the land ownership remain with the State	<ul style="list-style-type: none"> ✓ To meet the demand of forest-fringe villagers for various forest produce, including timber and NTFP ✓ Lately, to ensure various ecological services
Civil & Soyam (CS) Forest (legally classified as Protected Forest)	CS Forest includes: <ul style="list-style-type: none"> ✓ Old reserved forests in the old Kumaon area under the notification of 1893, after formation of VPs ✓ Class III forests notified in 1897 in the old Tehri State ✓ Former Zamindari forests that were left un-notified as reserved forests (known as “Khat forests”) 	Under the control of Revenue Department (District Magistrate)	<ul style="list-style-type: none"> ✓ To meet the requirements of the fringe villagers, present and future land requirement for various developmental activities ✓ A large number of leases were allotted on this forestland to the villagers. Now this is also under the purview of the Forest Conservation Act, 1980.
Unclassified & Vested Forest	The Forests that are still under the process of reservation is known as Unclassified/Vested Forests	Under the control of Forest Dept.	To improve the condition of the Forests. Small areas (about 5,541 ha) of such forests exist in Uttarakhand.

Forestland Type	Description	Management	Broad Management Objective
Private forests	Cantonment Forests, Municipality Forests, Township Forests, Central Government's Forests and forests of private individuals	Under the control of respective authority and individuals	Originally to earn revenue now environmental considerations.

Source: JICA Preparatory Survey Team

The Uttarakhand Forest Department is unique in a sense that two types of divisions (field functionaries) exist, namely territorial and non-territorial divisions. Both divisions operate in the same geographical areas of territorial divisions (overlapping). The non-territorial divisions operate in the areas outside the Reserved Forests, while the territorial divisions manage mainly Reserved Forests, although some territorial divisions also work on VP and CS Forests. The types of divisions and their major jurisdictions are summarized in the table below:

Table 3.3.2 Type of Division and Jurisdiction

Type of Division	Major Jurisdiction		Division
1. Territorial Forest Division (a map is shown in Attachment 3.3.1)	In charge of the management of Reserved Forests, but some divisions also work in selected VP and C&S forests as well.		Total 24 territorial forest divisions, in addition to Kedarnath WL Division, Kalagarh WL Division.
2. Non-Territorial Forest Division (a map is shown in Attachment 3.3.2)	Carry out certain activities under various Schemes/Projects (SWC, plantation etc.) outside Reserved Forests, including VP and C & S Forests under the control of VPs and Revenue Dept. respectively	Soil Conservation Division	Alaknanda SC Division, Kalsi SC Division, Lansdown SC Division, Nainital SC Division, Ramnagar SC Division, Raniket SC Division, Uttarakhashi SC Division,
		C&S Forest Division	Almora CS Forest Division, Pauri CS Forest Division
		Others	Tehri Dam I Division, Tehri Dam II Division
3. Offices for Protected Areas	In charge of the management of National Park, Tiger Reserves, Wildlife Sanctuaries and Biosphere (both Conservation Reserves & 3 WL Sanctuaries are under the control of respective Territorial Divisions)		7 WL sanctuaries, 6 National Parks (including 1 Tiger Reserve), 1 Biosphere Reserve and 2 Conservation Reserves.

Source: JICA Preparatory Survey Team

3.3.3 Staff Strength of UKFD

The figures show that the Indian Forest and State Forest Service positions are more or less filled against the sanctioned post, whereas a severe understaffing is observed at the level of Range Officer (30% filled against the sanctioned posts). The Foresters (67% of the sanctioned posts) and Forest Guards (78% of the sanctioned posts) who are going to be working with VPs in this project are also not fully recruited. The Survey Team has been informed that the state government has already initiated to recruit more staffs and thus, expect the sufficient number of field level FD staffs to be posted before the commencement of the proposed project. The summary of the staff strengths is given below and detailed table is given in **Attachment 3.3.3**.

Table 3.3.3 Number of sanctioned Posts and in position under different Cadre

	Name of Post	Sanctioned Position (nos.)	Posts in position in FD (nos.)	Posts in State deputation (nos.)	Posts in GOI deputation/ leave (nos.)	Total posts in position (nos.)
1	Indian Forest Service	66	56	16	6	78
2	State Forest Service	125	109	0	0	109
3	Subordinate Forest Service (Forest Range Officer/ Deputy Range Officer/ Forester)	2,445	1,638	0	0	1,638
4	Lower Subordinate Forest Service (Forest Guard)	3,650	2,856	0	0	2,856
5	Statistical Service	71	18	0	0	18
6	Ministerial Services	780	559	0	0	559
7	Stenographer Cadre	79	40	0	0	40
8	Account Cadre	114	41	0	0	41
9	Draftsman Cadre	55	44	0	0	44
10	Surveyor Cadre	51	43	0	0	43
11	Driver Cadre	250	102	0	0	102
12	Class-IV Cadre	1,348	1,045	0	0	1,045
13	Other Posts	92	38	0	0	38
14	Surplus/ Discontinued Posts	103	3	0	0	3
15	External Source Services	0	0	0	0	0
16	Total	9,229	6,592	16	6	6,614

Source: Uttarakhand Forest Statistics, 2011-12, UKFD

3.3.4 Existing Facility and Equipment

Focusing on the identified project divisions, and in related circles and ranges, information on facilities and equipment currently existing within the forest department is generated through a questionnaire developed by the study team. This information was further supplemented with the observations and discussions made by various specialists during the field visits. Synthesis of the information collected is presented in subsequent paragraphs:

(1) Office Infrastructure

- a. After the creation of the Uttarakhand state the headquarters of the forest department is located within the exiting offices of the Chief Garhwal region. To meet the requirement a small building was constructed in 2003, which was further modified in 2009/10 and currently houses GIS Lab, conference hall 'Manthan' and some other offices. A well-planned headquarters building is under construction, and has been designed to accommodate the current office strength and assessing some future requirements. This building is expected to be commissioned in next 1-2 years. Since project is expected to get started by next financial year, the existing Headquarter (HQ) building would not be ready by that time, and may also not have adequate provisions for proper PMU office functioning. Thus, initially PMU office can operate from rented premise, but creation of new building as asset for the forest department to house PMU and later other offices would be more appropriate.
- b. Almost all of the identified project divisions have office buildings, and the space is sufficient for the current staff strength. However, DFOs have indicated that if staff strengthens increases, addition space would be required, which will be the case during the project implementation. Most of the divisions have indicated that additional space for extension of divisional office buildings is available.
- c. At the range level, offices exist as per the forest department standard. The ranges have less office staff and also have limited resources at their disposal, which affects their regular functioning,

given the responsibilities they are entrusted with. Scope of extension of range offices buildings and strengthening of resources is indicated and observed as well.

(2) Equipment/ Facility

Information on computers, printers, Internet, Power back-up, Electricity etc. was taken from the identified project divisions.

- a. Computers and Printers: All divisions are equipped with computers. The questionnaire response indicates that around 155 computers and 100 printers are available across 13 divisions. However, few divisions have indicated that the machines are either outdated or not functioning properly. Printers are also available but they may require better quality printer for printing reports. In 37 project ranges 27 computers and 24 printers are available. Some 11 ranges are not having any of the equipment.
- b. Internet access: All the 13 project divisions are having internet access but none of the 37 project ranges is having Internet access currently.
- c. Power back-up: Mostly divisions are having UPS systems (21 units across 13 divisions) that come along with the desktop computers and power back-up, but not all ranges are having even UPS. Few divisions have also indicated that they have inverters and small diesel generators.
- d. All the divisional and range offices have electricity connections.

(3) Mobility

Information using the questionnaire was collected on the availability of cars, 4-wheel drive and motor cycle etc. from the identified project divisions. Almost all divisions have ranging from 2 to 5 numbers of 4-wheel drive vehicles, and only Mussoorie division has a car. Devidhura range alone in Champawat division has one 4-wheel drive; other project ranges do not have 4-wheel drive vehicles. Motorcycles are available in only two project divisions i.e. CS Almora (1) and Mussoorie (7). At range level motorcycle is available in only two identified project ranges – Mussoorie and Raipur of Mussoorie forest division.

(4) GIS infrastructure within UKFD

UKFD is having its own IT Cell (GIS laboratory) situated at PCCF office, Rajpur Road, Dehradun. The laboratory is equipped with commercially available GIS and image processing software to meet the existing requirement and available technical staff. The list of key hardware and software is given below:

Table 3.3.4 Hardware of GIS Laboratory of UKFD

Item	Model/Key Specification	Quantity	Place Name
Arc GIS	Version 9.3	1	IT Cell (PCCF) Dehradun
Erdas Imaging 9.3	Version 9.3	1	IT Cell (PCCF) Dehradun
Workstation	HP Z 200	1	IT Cell (PCCF) Dehradun

Source: JICA Preparatory Survey Team

It is also learnt from UKFD that 1 license each of Arc GIS is also available with FTI, Haldwani and Corbett National Park. IT Cell (PCCF), Dehradun does not have a Plotter and Scanner.

Sufficient number of GPS (142 units) is available in most divisions barring a few divisions that have a few numbers or none (e.g. Pithoragarh Division, Bageshwar Division and Almora C&S Division). The divisions barring few project ranges, are having 1-2 GPS hand-handled devices. At the range level, 60-70% of them have GPS instruments with them although processing of GPS data seems to be limited at Range levels.

UKFD also has a good amount of basic GIS data layers available with them. Most of the data layers are also acquired from Watershed Directorate, which is supposed to have a good GIS database and infrastructure. The list of GIS data layers that are available with UKFD is listed below:

Table 3.3.5 Data Layers Available at GIS Laboratory of UKFD

	Major Group	Data Layers
1	Base Layers	Road
2		Drainage
3		Settlement
4		Village Boundary
5		District Boundary
6	Forest Boundaries	Forest Administrative Boundaries
7		Forest Compartment Boundaries
8		Forest Boundary (RF)
9	Forest Resource	FSI Forest Cover - Report 2011 (Data representing Year 2009 scenario)
10		FSI Forest Type - Report 2011 (Data representing Year 2009 scenario)
11	Other Data Layers	Watershed Boundary
12		Slope Map
13		DEM (SRTM)

Source: JICA Preparatory Survey Team

Within UKFD's IT Cell there are two contractual technically trained GIS staff working to cater for the present departmental need. At field level outside IT Cell, knowledge of Remote Sensing and GIS is almost nil. As far as knowledge of usage of GPS and its functionalities are concerned, field staff seems to know about how to record Latitude and Longitude coordinates but this is not a rule everywhere and at many places even GPS instruments are not available.

3.3.5 Budget of UKFD

The budget progression of the UKFD between FY 2009/10 and FY 2011/ 12 is shown in the table below. UKFD has a budget outlay of INR 1,450 millions in FY 2011/ 12.

Table 3.3.6 UKFD Budget at a Glance (INR millions)

Particulars	FY2009/10	FY2010/11	FY2011/12
Outlay	1,025.48	1,174.78	1,450.00
Budget Provision	1,390.79	983.96	1,136.03
Government Sanction	880.90	950.45	790.43
Expenditure	850.45	929.77	767.75

Source: Uttarakhand Forest Statistics, 2011-12, UKFD

The table below shows the outlay, budget provision, sanctions and expenditure of UKFD in FY 2011/12. It shows that the State sector schemes and centrally sponsored schemes account for the bulk of its expenditure.

Table 3.3.7 Outlay, Budget provision, Sanctioned amount and Expenditure of UKFD - FY 2011-2012 (in INR millions)

	Particulars	Outlay	Budget Provision	Government Sanction	Expenditure
1	District Sector Schemes	110.36	96.00	96.00	95.98
2	State Sector Schemes	1,048.26	520.27	301.62	290.64
3	Centrally Sponsored Schemes	275.30	479.38	380.49	368.95
4	Grant No.30: Special Component Plan	20.00	10.00	10.00	14.50
5	Grant No.31- Tribal Sub Plan	15.60	15.00	15.00	15.00
6	Grant No. 17 & 30: From Agriculture Department	0	0	35.00	35.00
	Total	1,469.52	1120.65	838.11	820.07

Source: Uttarakhand Forest Statistics, 2011-12, UKFD

3.4 Forest Management Practices

3.4.1 Overview of Forest Management in Uttarakhand

Uttarakhand has about 65% of the land under forestlands, and the Uttarakhand Forest Department (UKFD) is responsible for managing the forests and biodiversity in the state. Uttarakhand, formally known as “Uttaranchal”, was divided from the State of Uttar Pradesh in 2000 as an independent state, and the Forest Department in the Uttarakhand part is one of the oldest state forest departments in India with a history of forestry reaching back by about 150 years into the middle of the nineteenth century. This historical depth and experience is an enabling factor in competently managing the climatic, geographical and genetic variety of forests and wildlife.

UKFD is organized into territorial entities starting from beat, which is the smallest unit in the field to primarily conserve but also to respond to the contemporary needs of the citizens, such as fuel wood, fodder, timber for house construction and agricultural implements and right for grazing and use of NTFP. Keeping these issues in mind, management priorities are spelt out below, roughly in an order of priority:

- Conservation of forests including wildlife and its habitats.
- Providing ecological services to the citizens including conservation of soil and water regime.
- Maintenance and enhancement of tourism values.
- Production and harvest of forest produce, such as timber resources including teak, sal, eucalyptus, poplar Deodar, as well as NTFP, minerals, stones, sand on scientific lines.
- Generation of employment.
- Participation in developmental initiatives of the Government

3.4.2 Participatory Forest Management/ Van Panchayat/Community Forestry

(1) Van Panchayats

Van Panchayats (VPs) can be regarded as an institutionalized form of traditional forest management. Unique to Uttarakhand, these people-centric institutions are engaged in organized utilization and protection of forests and related natural resources by village communities.

History

The origin of VP can be traced to the forest settlements carried out by the British which led to restricting the community rights over forests and led to increasing government control over the local forests.

Following massive protests by the local communities against the oppressive forest policies of the British, a Forest Grievance Committee was formed in 1921 to resolve the increasing conflicts between the state and the people. The major grievances of the people, as identified by the Committee in its report, were restrictions imposed on the lopping and grazing, the placing of boundary pillars too close to cultivated areas, the ban on putting fires in pine forests and the reservation of measured (*naap*) land.

At the recommendation of the Committee the reserve forests were reclassified into Class I and Class II forests. Class I forests mainly comprised of broad-leaved species, having little commercial value while Class II forests comprised of commercially valuable species such as Chir pine, Deodar etc. Class I forests were de-reserved and handed over to the Revenue Department and VPs were formed on these forest areas as well as on C&S lands¹.

¹ Civil Soyam (CS) is a term used for revenue forest land.

Legal status

The VP Regulation, under the District Scheduled Act of 1874, was introduced in 1931 to govern the VPs. However, these rules were not applicable to Chakrata forests and forests within the erstwhile Tehri princely estate, consequently the earliest VPs were constituted in Kumaun Division and in Chamoli and Garhwal (now Pauri Garhwal) districts of Garhwal Division.

Prior to formation of Uttarakhand, the VP Regulation Act, 1931, was revised in 1972 and 1976 and these revised rules were also applicable to Tehri and Chakrata.

The formation of new state of Uttaranchal led to the formulation of *The Uttaranchal Panchayati Forest Rules 2001*, which resulted to significant curtailment of the autonomy of these community organizations and was an attempt to bring these institutions under the fold of the Joint Forest Management (JFM) as a World Bank supported JFM project was ongoing in the state.

Later, the Uttaranchal Panchayati Forest Rules, 2005 were promulgated which sought to consolidate the two types of VPs that existed in the State; (a) VPs carved out of reserve forests and governed by the Indian Forest Act 1927, and; (b) VPs constituted on civil & soyam land and governed by the District Schedule Act 1931.

Administrative Arrangement

In UKFD, one Principal Chief Conservator of Forest (PCCF) post out of 4 PCCF posts has been created to oversee VPs and JFM. The office of Principal Chief Conservator of Forest (PCCF)- VP and Joint Forest Management Uttarakhand (JFM), was created at Glenthorn Compound, Nainital in year 2005 but due an Government Order in December 2012, the office has been relocated in Haldwani in the office of Chief Conservator of Forest (CCF - Vigilance and Legal Cell). Following are some of the key responsibilities of the PCCF - VP & JFM:

- To advice PCCF (Head of Forest Department/ HOD) and State government on participatory forest
- All matter related to establishment and administration under his/her jurisdiction including entries in Annual Confidential Reports
- Visualize, formulate, amend, revise the policies, guidelines, rules, regulations etc. related to VP and JFM
- Act as Secretary to the Advisory Cell established at State-level for VP and JFM, and guide divisions and institutions on disputes with participatory actions
- Planning, implementation, monitoring & evaluation of all works/ schemes related to VP, JFM, Forest Development Agency (FDA) and progress reporting
- Any other works as entrusted by PCCF (HOD) or State government

The PCCF (VP & JFM) is supported by Additional Principal Chief Conservator of Forest (APCCF), Conservator of Forest (CF), Deputy Director, Statistical Officer (SO), Assistant SO, Range Officer (RO), Deputy RO, three foresters, two forest guards and administrative staff. Currently many of these positions are not sanctioned by the Government. The office is also equipped with vehicles, computers, fax, Xerox machines, but not sufficient to support the office operations. In future this office is likely to get shifted to Dehradun after the upcoming Headquarters building is completed.

Presently, the office is implementing three schemes viz., Compensatory Afforestation Fund Managements and Planning Authority (CAMPA), State Forest Development Agency (SFDA) under National Afforestation Program (NAP), and State sector scheme. This office collects the information from respective divisions as a part of regular monitoring and evaluation system, and communicates reports to respective scheme offices.

Status of VPs in Uttarakhand

Until the year 2000, the state had a total number of 6,777 VPs covering nearly 400,000 ha (averaging approximately 60 ha per VP, 12% of the total forest area of Uttarakhand). Majority of these VPs were constituted for the entire Gram Sabha and all the revenue villages within the Gram Sabha had equal rights over the VP forest.

However, subsequent State policies sought to increase the number of VPs and also to ensure that a VP may be constituted for all revenue villages with forests. Consequently, a large number of new VPs were formed, especially between the 2001 and 2005, while at the same time multi-village VPs were re-organized. Presently there are 12,089 VPs in 11 districts² of Uttarakhand managing an area of over 545,000 ha comprising about 16% of the total forest area of the State. As there are about 16,000 villages in the State, almost all the villages with forests would have been covered already, and there is very little scope of new VPs.

Those 5,300 VPs created after 2000 have an average of 25 ha of forestland only. A majority of the VPs, particularly those formed in the past decade, have been constituted in a very small area. Available statistics indicate that 1,172 VPs have less than 2 ha area, while 2002 VPs have an area between 2 to 5 ha as shown in the table below:

Table 3.4.1 Distribution of VPs based on area

Area under VP (ha)	Number of VPs	Area under VP (ha)	Number of VPs
0 to 2	1,172	50-100	1,124
2 to 5	2,002	100-150	322
5 to 10	2,283	150-200	169
10-15	1,359	200-500	195
15-20	975	500-1,000	43
20-50	2,381	>1,000	19
		Total	12,044

Source: Source: Tewari, P. and P. Phartiyal (undated), *Strengthening of Community Managed Institutes (Van Panchayats) through Public-Private Partnership in Uttarakhand, India*

Note: Area is not confirmed for 45 VPs

(2) Joint Forest Management

Prior to the formation of a separate state of Uttarakhand, a Joint Forest Management (JFM) program was formulated in 1997 by the state of Uttar Pradesh. Funded by the World Bank, this program was introduced from 1st February, 1998 for a period of 5 years.

Legal status

JFM program was introduced after the erstwhile Uttar Pradesh government enacted JFM rules in 1997. However, subsequent to the formation of Uttarakhand in the year 2000, Uttaranchal Village Forest Joint Management Rules were enacted in 2001.

Status of JFM in Uttarakhand

The World Bank funded a JFM project during the 1990s and 2000s, and the project was implemented in 35 Forest Divisions in Uttarakhand involving a financial outlay of INR 401.60 million. A total of 1,217 Village Forest Committees (VFCs) and 98 Eco-Development Committees (EDCs) were formed covering an area of 2,649.52 km² comprising of 2,061.66 km² of forest land and 587.86 km² of civil soyam and revenue land.

² Almora, Bageshwar, Chamoli, Champawat, Dehradun, Nainital, Pauri, Pithoragarh, Rudrapur, Tehri and Uttarkashi.

Table 3.4.2 JFM committees constituted under World Bank forestry project in Uttarakhand

Name of the scheme	No. of committees	Area (sq. kms)
VFC under World Bank Forestry Project	1,217*	2649.52
EDC under World Bank Forestry Project	98	-
Total	1,315	2,649.52

* These include 729 VPs and 488 VFCs.

Source: Comptroller and Auditor General (CAG), State Audit Report 2004-05.

A large number of VPs were included under the fold of the JFM program and, out of the total, 729 VFCs were formed in VPs. However, the program was implemented at a slow pace during 1998-99 (only 65 VFCs formed) and 1999-2000 (229 VFCs formed).

Table 3.4.3 Year-wise formation of VFCs under World Bank Forestry Project in Uttarakhand

Year	No. of VFCs formed	Cumulative number of VFCs
1998-99	65	65
1999-2000	229	294
2000-2001	923	1,217

Source: CAG, State Audit Report 2004-05

Although this program was initially conceived as the first phase of a long term program but subsequent to the completion of first phase in July 2003 this program was discontinued. There is a lack of clarity regarding the future of the VFCs formed under this project and whether they were able to sustain beyond the project duration, particularly since Uttaranchal Panchayati Forest Rules, 2005 superseded the Uttaranchal Village JFM Rules, 2001.

Under the National Afforestation Program (NAP), a total of 38 Forest Development Agencies (FDAs) were formed with the total number of 900 VFCs. In FY 2013/14, 15 FDAs funded 155 VFCs in Uttarakhand (UKFD PCCF VP&JFM Office, 2013).

3.4.3 Working Plans, Working Schemes & Composite Management Plans

All Forests are managed under the prescription of a Working Plan/ Scheme prepared under the guidelines given in National Working Plan Code (2004) on the basis of principles of sustainable forest management under recognized and innovative silvicultural practices. The authority as designated by the ministry of Environment & Forests, Government of India (GoI), approves the Working Plan (WP) for this purpose. Generally no timber harvesting and other activities are done in any forest area without an approved WP. In Uttarakhand WPs have been prepared for all the 26 Territorial Forest and Wild Life (WL) Divisions which are under the administrative control of UKFD, and they are regularly revised after 10 years. A list showing status of WP of the Forest Divisions is given at **Attachment 3.4.1**.

The non-territorial Forest Divisions, i.e. C&S and Soil Conservation Divisions are not covered under the WPs, they work on the guidelines issued under various projects/schemes mainly on C&S and VPs areas.

(1) Working Circle (WC)

In a WP, a specific management practice for each of the specific areas is prescribed as a Working Circle (WC). The forest areas in a division consist of different WCs, and each WC is managed under a particular silvicultural system. The WCs are broadly divided into main WCs and overlapping WCs. Depending on the composition and objectives of management of the forest although the constitution of WCs in a WP varies from Division to Division, some of the important main and overlapping WCs prescribed in the WPs are:

Main WCs (with fixed territorial boundaries): Sal Shelter Wood WC, Chir Pine WC, Twisted Chir Pine WC, Deodar-Kail WC, Oak WC, Fir-Spruce WC, Protection & Development WC.

Overlapping Working Circles (OWCs): Plantation OWC, NTFP & MAP OWC, Forest Protection OWC, JFM OWC, Wildlife Management OWC, Resin Tapping OWC, Fire Protection OWC, Conservation of natural water sources, water & soil conservation OWC, Biodiversity conservation OWC.

(2) Silvicultural Systems

Depending on the Silvicultural System to be applied for management of the forests of a Forest Division, the area of forest is divided into various Working Circles (WCs). The Silvicultural System currently prescribed for some of the important forests of Uttarakhand in various WPs are as under:

Sal (*Shorea robusta*) Forest: Generally found in the foot hills, i.e. Sub-Tropical eco-climatic zone comprising about 313,054 ha (12.82% of the forest area of Uttarakhand) are mainly to be managed under “Irregular Shelter Wood System”. Under this system maximum use of all groups of advance growth is taken, no seeding felling is generally taken but light crown opening (up to 0.5 crown density) is carried out and as regeneration progresses, the top canopy is gradually lightened in at least two operations. Other subsidiary operations include; shrub cutting, control burning, soil working before seed fall, weeding.

Chir (*Pinus roxburghii*) Forests: This is the most important and wide spread forest of the Warm Temperate Zone comprising about 394,384 (16.15% of the forest area), generally to be managed under “Conversion to uniform system” or under “Uniform Shelter Wood System”. Under this system for regenerating the forests groups of established saplings and poles up to 30 cm. diameter are retained as part of future crop and generally 15-25 seed bearers are retained and rest felled. Protection from grazing & fire is maintained till the regeneration is established, i.e. reaches height of 1-3 meters. Shrub cuttings and cleaning operation also carried out. Cutting back of broadleaved species like oak is considered not desirable. The seed bearers (over wood) may be removed when the poles reach a height (6-9 meters) to escape destruction in accidental fires.

Oak (*Quercus leucotrichophora*) Forests: This is one of the most important forest of the Cool Temperate Zone, occasionally also found at Northern aspects of Warm Temperate zone spread over about 383,088 ha (15.69% of the forest area). This forest was generally managed under either Selection System or Coppice with Standard System. Presently most of the oak forests are managed under protection and development working circle or working series, under which the area is treated under intensive soil and water conservation operations followed by silvicultural operations like cutting back of root stocks, pruning etc.

Deodar (*Cedrus deodara*) Forests: This forest is generally found in the Cool Temperate zone and is associated with blue pine and oaks as well comprising about 37,330 ha (1.5% of the forest area). This forest was managed firstly under Selection System, then under Uniform System. Presently Shelter wood System has been suggested for deodar forests. Under the Shelter wood system 45-100 trees per hectare are left as seed bearers, all patches of advance growth and established poles up to half rotation age (about 60 years) are retained as future crop. Closure of grazing, fire control and if required strips are to be also cleared in good seed year.

Fir and Spruce (*Abies pindrow* and *Picea smithiana*) Forests: This is another important forest of the Cool Temperate zone extending to the Sub-Alpine zone comprising about 92,465 ha (3.78% of the forest area). Selection System with certain safe-guards is the Silvicultural system prescribed for these forests. Natural regeneration is a big problem in these forests. Only some selected trees where there is sufficient well established advance growth are removed. Summer grazing is very heavy which is to be controlled, thick humus on the floor to be removed to get regeneration.

(3) Working Schemes & Composite Management Plans

While detailed WP is prepared for large area such as forest division, working schemes are to be prepared for smaller areas for a specific purpose or areas like private, village, municipality, cantonment forests, etc. The working schemes should also have all major elements of WP; and these schemes also need the sanction of competent authority designated by the Ministry of Environment & Forests (MoEF) (National Working Plan Code 2004).

The provision of Composite Management Plan (CMP) for the village forests/Panchayati Forests has been given in the VP Rules (2005). According to this provision in the VP Rules a Divisional Forest Officer shall prepare a CMP for all the village forests/Panchayati Forests within his/her control for a period of five years and get it approved by the concerned Conservator of Forests. The Management Committee of a VP has to prepare a micro plan on the basis of the guiding principles given in the CMP for the management and protection of the VP forests. The micro plan is to be approved firstly by the General Body of the VP and finally to be sanctioned by the concerning Sub-Divisional Forest Officer and then to be implemented by the Management Committee.

In case of Uttarakhand, according to the directions given in the National Working Plan Code 2004, all the VP forests and CS Forests should have working schemes approved by MoEF for any operations to be carried out in these forests on the line of approved WPs for forests of a Forest Division. And according to the VP Rules 2005, all VPs should have approved micro plan, prescriptions of which are to be followed for operations in a VP forest.

Presently working schemes are not prepared for either VP forests or C&SFs. Composite Management Plan (CMP) has not been prepared by most forest divisions for the VPs of its area (the exception is of the Bageshwar Division). Micro Plans are also not prepared in all the VPs. However, micro plans have been prepared for those VPs where work under the National Afforestation Programme (generally known as “FDA projects”) were operated or are in progress under the operational guidelines of this program. As such from 2006-07 to 2011-12 about 644 VPs have been covered under this program. Attempts have been made since past few years to prepare micro plans on priority and up to 2012-13, 4,767 micro plans have been prepared for various VP forests. In the VP forests and also C&SFs various operations like removal of dead & fallen trees, resin tapping, collection of NTFP (including MAPs), Soil and water Conservation, and plantation works are carried out under various schemes; some of the NGOs are also working in the VP areas.

3.4.4 Current Mechanism of Project Implementation, Monitoring and Evaluation

The survey team has reviewed the mode of implementation and monitoring & evaluation mechanism of other implementing agencies of forestry and watershed management projects: National Afforestation Program (NAP), Compensatory Afforestation Fund Management and Planning Authority (CAMPA), and Watershed Management Directorate (WMD). The lessons were drawn and incorporated in the planning of the proposed project. The results of the review are given below.

Table 3.4.4 Key agencies working in forests of the State of Uttarakhand

Agency	Mechanism of Project Implementation	Monitoring & Evaluation
FDA – Forest Development Agency National Afforestation Program (NAP) Scheme was initiated by converging all afforestation schemes of the 9th Plan period to avoid duplicity or redundancy, and at the same time keeping in focus the decentralization agenda of the government. NAP is being operated as a 100% Central Sector Scheme. NAP Scheme aims to support and accelerate the ongoing process of devolving forest protection, management and	The NAP is being implemented through a two-tier structure of Forest Development Agency (FDA) at the forest division level and JFMC at the village level. Thus, FDA is the confederation of JFMCs in that forest division. FDAs are registered under the Societies Registration Act. JFMCs are registered either with the Forest Department or under Statutory provisions. The district-level officers of relevant line departments of the State Govt. and Panchayat Raj Institution are members of FDA.	<ol style="list-style-type: none"> With a view to increasing the efficiency of NAP to meet the above goals, the monitoring and evaluation (M&E) exercise of the FDA projects is undertaken both by the State and Central Governments National Afforestation and Eco-development Board undertakes the first independent mid-term evaluation of the FDA projects within 24 months of sanction of the project with focus on people’s participation, functioning of JFMCs/ EDCs and the micro-planning exercise. The final evaluation is required to be carried in the fourth year of the Project. Field-level monitoring of the NAP program is done as per the standard practices established under

Agency	Mechanism of Project Implementation	Monitoring & Evaluation
development functions to decentralized institutions of Joint Forest Management Committee (JFMC) at the village level, and Forest Development Agency (FDA) at the forest division level.		departmental functioning. Roles of Zone, Circle, Division and Range is well defined, and inspections and record keeping system established through administrative order is followed.
<p>CAMPA – Compensatory Afforestation Fund Management and Planning Authority</p> <p>State CAMPA is intended as an instrument to accelerate activities for preservation of natural forests, management of wildlife, infrastructure development in the sector and other allied works. The State CAMPA would presently receive monies collected from user agencies towards compensatory afforestation, additional compensatory afforestation, penal compensatory afforestation, Net Present Value (NPV) and all other amounts recovered from such agencies under the Forest (Conservation) Act, 1980 and presently lying with the Adhoc CAMPA. State CAMPA would serve as a common repository of funds accruing on account of compensatory afforestation and NPV. It would deploy funds as per guidelines governing the use of funds for conservation, protection and management of forests. The amounts would also be deployed for wildlife preservation and enhancement of wildlife habitats.</p>	<p>State CAMPA consists of a Governing Body, a Steering Committee and an Executive Committee.</p> <p>Governing Body (GB) is headed by Chief Minister with Secretary (Forests) acts as Member Secretary to the GB. The GB shall lay down the broad policy framework for the functioning of State level CAMPA and review its working from time to time. Below this is the Steering Committee which is headed by Chief Secretary and CCF (Plan/ Scheme) acts as Member-Secretary to it. Committee's main responsibilities are: (i) lay down and / or approve rules and procedures; (ii) monitor the progress of the utilization of funds released by the State CAMPA; (iii) approve the Annual Plan of Operation (APO) prepared by the Executive Committee; (iv) approve the annual reports and audited accounts of the State CAMPA; (vi) ensure inter-departmental coordination; Planning, coordinating execution and supervision is the main responsibility of the Executive Committee that is headed by PCCF and one of the officers from Forest Department is designated as Nodal Officer that acts as Member-Secretary to this state level Executive Committee.</p>	<ul style="list-style-type: none"> a. An independent system for concurrent monitoring and evaluation of the works implemented in the States utilizing the funds available shall be evolved and implemented to ensure effective and proper utilization of funds. b. The National CAMPA advisory council has the powers to order special inspection and financial audit of works executed by the State CAMPA with utilizing CAMPA money. c. If satisfied that the funds released are not being utilized properly, the National CAMPA advisory council as well as the State level Steering Committee shall have the power to withhold or suspend the release of remaining funds or part thereof. d. Field-level monitoring includes GPS recording for the sites, Photo documentation at two stages – prior to intervention and post intervention, record keeping including updating plantation journal, Daily Tour Diary and remarks by inspecting officials. e. Monitoring of the Survival percentage is also done as per the prescribed norms, and referred as benchmark during inspection. f. Auditing is rigorously followed, and is considered very important element of monitoring. g. CAMPA also has MIS system in place. Uttarakhand CAMPA has also engaged an agency (TERI) for external monitoring.
WMD – Watershed Management Directorate Uttarakhand Govt. has realized the significance of taking up watershed based planning, and thrust has been given to Integrated Watershed Development Programs. A separate Directorate- WMD has been established as a nodal agency for coordination,	The mandate of WMD is to prepare and implement watershed based projects, and act as repository of watershed related information. It is headed by Chief Project Director. More precisely, Project preparation of integrated watershed development projects following GoI guidelines Arranging finances from GoI and other external/ internal agencies for implementation of watershed	WMD has adopted both MIS and GIS technologies for regular monitoring. As per the program requirement external agency is also engaged for undertaking baseline surveys and periodic impacts evaluations. The following levels of project monitoring is being pursued under UDWDP and GEF component, viz. a) Internal Monitoring; b) External Monitoring; c) Participatory Monitoring and Evaluation; d) Environmental and Social Safeguard Monitoring, and e) Evidence based

Agency	Mechanism of Project Implementation	Monitoring & Evaluation
<p>monitoring and implementation of integrated watershed management programs in the state. Vision is to improve the productive potential of natural resources and increase incomes of rural inhabitants in degraded watersheds of the state through socially inclusive, institutionally and environmentally sustainable approaches.</p>	<p>projects Coordination with other line departments (Rural Development and Agriculture) and NGOs working on watershed development projects, evaluation and submission of project proposals to the respective Ministry and support agencies. Prioritization of watersheds to be taken up for treatment and project planning</p>	<p>monitoring Internal Monitoring:</p> <ul style="list-style-type: none"> - Annual Work program is monitored on monthly basis through Monthly Progress Reports generated at Divisional Level and consolidated at WMD level. - Random field visits, monthly meetings, check-list, brain storming, amidst all stakeholders at district level on monthly basis and half-yearly basis at regional level. - District-level Governing Committee under the Chairmanship of <i>Zilla Panchayat Adhyaksh</i> (District Panchayat Chairman) for monitoring and supervision of project - Indicators based Participatory Monitoring & Evaluation utilized for timely improving the field implementation

Source: Compiled by JICA Survey Team based on personal interaction and related Website information.

3.4.5 Research and Training

(1) Research

Organization: Forestry research in Uttarakhand started in a formal way in 1918 with the appointment of the State Silviculturist (Research & Development) with HQ at Nainital (present Uttarakhand) in erstwhile United Provenance/Uttar Pradesh (Uttarakhand was part of this state till 9th November, 2000). In 1961 two posts of silviculturists, one for hill region and other for sal region (Terai-Bhabar) were created. In the same year a post of Forestry Research & Working Plan was also created with HQ at Nainital which was shifted to Lucknow in 1964. After creation of Uttarakhand in 2000, the post of Silviculturist Sal was shifted to Uttar Pradesh, but it was revived in 2003 with HQ at Haldwani in the Uttarakhand as well. Conservator of Forestry Research also started functioning with HQ at Haldwani since 2000. In 2005 the post of Chief Conservator of Forest Biodiversity Conservation, Development & Research was created with HQ at Haldwani. In 2009 a new post of Additional Principal Chief Conservator (APCCF) of Forestry Research, Training & Management was created. Thus presently the Research wing is headed by Chief Conservation of Forest (CCF) (Biodiversity conservation, Development & Research) with HQ at Haldwani who works under the administrative control and guidance of the APCCF (Research, Training & Management). There is one Conservator of Forest (CF) Research with HQ at Haldwani. There are two silviculturists (Hill Region, Nainital & Sal Region, Haldwani). These regional silviculturists have five and ten ranges respectively which include research ranges (8), seed ranges (5) and statistical ranges (2).

Infrastructure: The infrastructure presently available with the Research wing are: Research Nurseries-14 (about 30 ha), Mist Chambers- 16, Shade houses-12, Compost/ Vermi-compost units-7, Seed Processing Units with seed certification facility-4, Seed Stores-7, Seed Testing Laboratory-4, Soil Testing Laboratory-2, Library-2, Information Centres-2 and Seed Museum-1.

Important Research activities: Presently the Research Wing of UKFD is carrying out a number of research activities both basic and applied. Some of the important research activities include:

- a. For supply of quality certified seed and maintaining various seed production sources which include: Clonal Seed Orchards-8 (31.0 ha), Seed Production Area-27 (222.0 ha), Seedling Seed

Production Area-46 (91.0 ha) and about 400 Seed Plots & Seed Stands. During the year 2011-12 Research wing has supplied about 25,000 kg of quality certified seed to the various stake holders.

- b. Tree improvement program of eucalyptus, poplar & teak and genetic improvement program of teak and shisham (*Dalburgia shishoo*)
- c. Species selection of exotic bamboo species for plantation in Uttarakhand.
- d. Research on environmental factors affecting natural regeneration of sal (*Shorea robusta*).
- e. Research on developing Nursery techniques of various NTFP and indigenous species (which are now rare) of both the regions.
- f. Study on impact of ban on green felling on Chir Pine forests.
- g. Maintaining & recording data of 706 Sample Plots, Preservation Plots and Increment Plots of various species. Some of these are more than 50 years old.

Dissemination of Technology & Awareness: For publicity & dissemination of the findings of the research, important activities of the Research Wing include:

- a. Developed and maintaining two demonstration centers, one seed museum and one herbarium
- b. Published Annual Reports, booklets on nursery technology of various species, Seed Manual of important species, literature on phenograms and phenology of various important species.
- c. Organized training program for forest officials, field staff, VP members, farmers, students and for other organizations. During the year 2011-12 eight such training programs were organized.
- d. Maintenance of 85 ha Himalayan Botanic Garden at Sadiyatal (Nainital Division), 70 ha Herbal Garden cum Eco-Park at Munsiri (Pithoragarh Division), mini herbal garden at Haldwani and Deovan, bambusetum at Lalkua, poplaretum at Lalkua and Pinetum at Kalika (Ranikhet Division).

(2) Training

Training Programs for the FD staffs and the VPs are conducted mostly at Forest Training Academy (FTA) at Haldwani. There are two Forest Guard Training Centres in Jainti, C&S Forest Division and Rampurmandi in Chakarata Forest Division. A Wildlife Training Centre is located in Kalagarh, Corbet Tiger Reserve. These three institutes conduct short term training programs for the Forest Guards and are administered by the respective Divisional Forest Officer or Wildlife Warden. Currently, the rehabilitation of these training centres are undertaken with the support from JICA funded Capacity Development for Forest Management and Personnel Training Project (CDFMPT). The table below shows the Training achievements of the FTA for FY 2012-13.

Table 3.4.5 Training Achievement at FTA, Haldwani (FY 2012-13)

Training	Duration	No of Batches	Total No	Batch size	Level of Participants
Forest Range Officers	18 months	1	39	39	Forest Range Officers
Forester Training	6 months	2	48	24	Foresters
Forest Guard Training	6 months	2	77	39	Forest Guards
Van Panchayat Sarpanchs/ Members Training	3 days	4	78	20	Sarpanchs/ members/ secretaries
Scaler Vyavharik Training	3 months	3	272	91	Scalers
Refresher Course of Frontline Staff	13 days	3	95	32	Deputy Range Officers, Foresters, Forest Guards
Assistant Statistical Officer Training	6 days	1	29	29	Assistant Statistical Officer
GPS Training	3 days	1	53	53	Range Officers, Deputy Range Officers, Foresters, Forest Guards
Uttarakhand State Action Plan for Climate Change	1 day	1	61	61	ACF and above, FRO Trainees, Range Officers, Foresters
Total		18	752		

Source: Forest Training Academy, Haldwani. (Sep, 2013).

1) Training Programs for Forest Range Officer, Forester and Forest Guard

Topics Covered under the Training Programs for Forest Range Officers, Foresters and Forest Guards are as below. The emphasis is given on the technical aspects of forest management. Especially to note that Forest Range Officers are trained in JFM, Rural and Tribal Development in addition to the technical aspects of forestry.

Table 3.4.6 Contents of the Training Programmes for Range Officer, Forester and Forest Guard (FTA, Haldwani)

Forest Range Officer	Forester	Forest Guard
<ul style="list-style-type: none"> General Botany Applications of Modern Tools and Technology Silviculture - I/ II Forest Resource Assessment Forest Survey Forest Engineering Adverse Influences on Forests Forest Utilization - I/ II Forest Policy and Law Ecology and Environmental Sciences Forest Resource Management Natural Resource Management Forest Economics Biodiversity Conservation and Management Joint Forest management, Rural and Tribal Development Human Resources Development and Management Forest Accounts and Procedures 	<ul style="list-style-type: none"> Silviculture Forest Utilization Forest Protection and Law Forest Engineering Survey Forest Botany Accounts and Procedure Measurement Wildlife Management Community Forestry & Rural Development Soil Conservation and Land Management First Aid 	<ul style="list-style-type: none"> Silviculture I/ II Forest Protection & Law Survey & Engineering Forest Utilization Wildlife Conservation Accounts and Procedures Community Forestry & Rural Development Environmental Conservation
Duration: 18 Months	Duration: 6 Months	Duration: 6 Months

Source: Forest Training Academy, Haldwani (August 2013)

2) Training Programs for VPs

In FY 2012/ 13, FTA, Haldwani trained 78 VP sarpanches, members and secretaries in 4 batches. Considering the number of VPs and some of the new members are elected, it suggested a possibility that many of the VPs might not have had training for some years. The resource persons are mostly from the FTA itself. The annual training schedule is planned at the FTA for each financial year. Some of the feedback from the participants of VP training received by the academy shows that the participants found the training useful and highly relevant for other VPs. Thus, they suggested other VPs to be trained in the same way. The FTA also indicated some of the participants found it difficult to attend as the venue could be far away from their locality.

The VP training programs conducted at FTA, Haldwani includes the following topics and the duration of the training program is 5 days.

Table 3.4.7 Training Contents of VP Training Program conducted at FTA

Period	Content of the Training	
Day 1	<ul style="list-style-type: none"> • Introduction • Objectives • Indian Forest Act 1927 • Forest (Conservation) Act 1980 • Wild life(Conservation) Act 1972 	<ul style="list-style-type: none"> • Information on Key points of Tree conservation Act 1976 • Wild life Management • Human Wild Life Conflict- Causes and control measures • Man Eater Tiger (Film Show)
Day 2	<ul style="list-style-type: none"> • History of VPs • General Introduction of Uttaranchal VP Rules 2005 • Formation of VP, Meeting and proceedings, rights and role of VP and Annual Report of VP • Forest Produce collection according to VP Rules • Fixation, distribution and use of revenues from forest produce Office Records, VP Fund management 	<ul style="list-style-type: none"> • Budget, Accounts and audit • Information on key points of Rural Employment Schemes Uttarakhand Diversified watershed management project (Gramya) • Information on Key points of Mahatma Gandhi National Rural Employment Generation Scheme (MNREGS) • Bio-diversity conservation
Day 3	<ul style="list-style-type: none"> • Forest Fire Management- Use of equipments • Forest Fire Management- Film Show • Exposure Visit 	<ul style="list-style-type: none"> • Eco-tourism-brief introduction • Income generation/ employment generation of local population through Eco-tourism • Exposure visit to Eco-tourism Center Chunakhan
Day 4	<ul style="list-style-type: none"> • Land identification, species selection, nursery establishment, plantation and plantation management in Panchayat Forests for plantation work. • Land use and Soil and water conservation work according to carrying capacity of land 	<ul style="list-style-type: none"> • Sustainable development of resources • Ideal model of Village development • Soil and water conservation • Human Resource Development
Day 5	<ul style="list-style-type: none"> • Importance and preparation method of Organic manure • Organic manure Unit- Exposure visit to research nursery Haldwani • Forest Development Agency-Brief Introduction 	<ul style="list-style-type: none"> • Key records and maintenance of -FDA • Develop project proposal under FDA • Group discussion and solution to doubts • Course evaluation by participants

Source: Forest Training Academy, Haldwani. (August 2013)

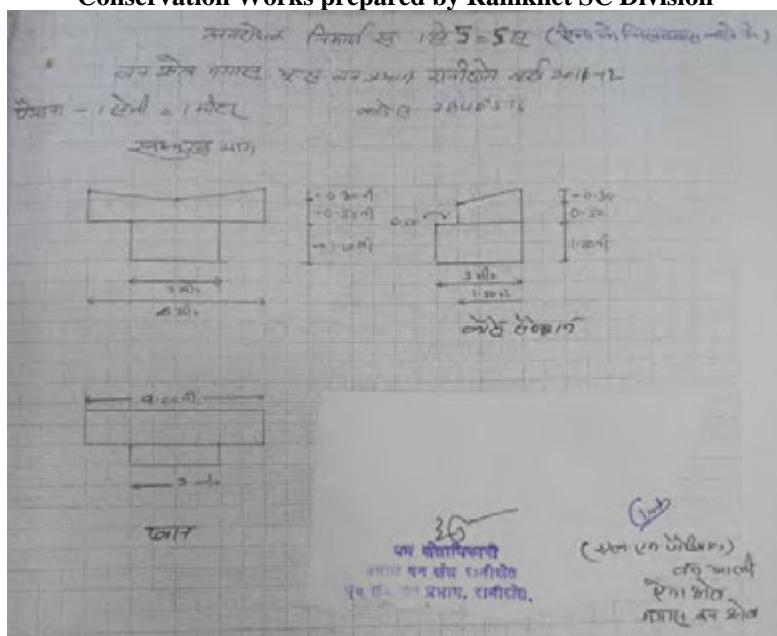
(1) Soil and Moisture Conservation Practices (Ranikhet SC Division)

Uttarakhand Forest Department (UKFD) is doing the soil and moisture conservation works in the state. The consultants discussed with the forest department officers regarding various Soil Moisture Conservation (SMC) measures undertaken by the state. To understand the activities, the JICA Survey Team reviewed the documents regarding drawings, estimations and the process involved to construct the structures and get clarity in field implementation also.

The team visited the Aina village, Dwarahat block of Almora district which is coming under Soil Conservation Division, Ranikhet. The division constructed a series of check dams made up of random rubble stone masonry with dry stone packing in upstream of the gully as part of gully control structures. One of the check dams was connected through a side drains/ trenches for cultivating agricultural practices by the villagers. Construction of the protection wall around the plantation / forest area for protection of fire and against grazing was also seen in the village.

(2) Prototype designs:

Figure 3.4.1 Sample Drawings and Design of the Soil and Moisture Conservation Works prepared by Ranikhet SC Division



The SMC structures constructed by the Ranikhet SC division in the Aina Village are shown below for better understanding about the activities. A series of gully control structures constructed to the treatment of the drainage system/ nalla.

Figure 3.4.2 Site Photograph of the Soil and Moisture Conservation Structures in Aina Village (20th August 2013)



Source: JICA Preparatory Survey Team

3.5 Forest Produce and Marketing

3.5.1 Timber Production

The District-wise timber production and revenue thereof for the UKFD from the forests of the Uttarakhand for the last three years is given in table below.

Table 3.5.1 District-wise Production of Timber in Uttarakhand

Unit: m³

District	2009-10	2010-11	2011-12
Almora	10,183	8,065	5,032
Pithoragarh	2,564	1,456	8,666
Nainital	43,249	47,454	113,759
Champawat	25,633	19,737	35,705
Bageshwar	4,794	7,049	4,032
US Nagar	76,895	39,785	2,947
Garhwal	17,027	11,015	10,748
Chamoli	1,736	2,348	1,040
Tehri	4,993	3,747	4,474
Uttarkashi	14,835	10,247	10,124
Rudraprayag	3,222	3,524	474
Dehradun	19,939	19,874	24,348
Haridwar	17,551	27,599	13,887
Total	242,621	201,900	235,236
Revenue from Timber	1,437,226,000	1,120,036,000	1,349,851,000

Source: Uttarakhand Forest Statistics 2011-12 & Communication from CCF, Administration

Considering the extent of forest cover in the state, the annual timber production of about 230,000 cubic meter and annual revenue from sale of timber at INR 1,300 million per annum is on extremely lower side. The main contribution to this production is from the forests of the Sub-Tropical *Shorea robusta* natural forests (where Assisted Natural Reforestation/ ANR operations are carried out) and from the plantation areas of eucalyptus, poplar and teak. Above 1,000 m altitude as there is ban on commercial green felling, only dead and uprooted/fallen trees are silviculturally removed. Felling of

green trees in the hill areas is limited up to the trees to be felled for various developmental works and to meet the right holders demand. All the operation concerning to felling/removal of trees are carried out through the Uttarakhand Forest Developmental Corporation (UFDC).

3.5.2 NTFP Promotion and Marketing Mechanism

Forests and forest products play a significant role in the economic as well as environment development of the state. Conservation, management and trade of NTFPs have always remained on the top of the development agenda of the state since its inception. In the following sections efforts have been made to review the current policies and practices for management, enterprise development and marketing of NTFPs.

(1) Policies governing NTFPs management and marketing

Commercial exploitation of NTFPs/MAPs started in 1921 in Uttaranchal region and marketing was done through auction. In 1950, the marketing rights were assigned to the Department of Cooperation, which continued till 1962. Thereafter private contractors were appointed by the Forest Department to collect and market different forest produces. Again in 1979 the marketing rights were awarded to Department of Cooperation. Bhesaj Sanghs (Medicinal Plants Cooperative Unions) came into being in 1949 as district level cooperatives to deal with different medicinal plants. Now also these Bhesaj Sanghs, under the directions of Bhesaj Development Unit (BDU), Horticulture Department are said to play important roles in collection of NTFPs and cultivation of Medicinal Aromatic Plants (MAPs). After the formation of Uttarakhand in 2003 an elaborate policy of conservation, development and harvesting of medicinal plants was formulated. From 2004 restrictions were imposed on harvesting of different NTFPs/ MAPs and NTFP *Mandis*/ Markets were set up in three places to allow open auction of NTFPs/ MAPs both from the forest and private land.

Key institutions dealing with NTFP promotion and marketing

- ✓ Uttarakhand Forest Development Corporation (UFDC)
- ✓ State Medicinal Plants Board (SMPB)
- ✓ Centre for Aromatic Plants (CAP)
- ✓ Herbal Research Development Institute (HRDI)
- ✓ Bhesaj Development Unit / District BhesajSanghs
- ✓ Bamboo and Fiber Development Board

Despite being declared as Herbal state most of the important Himalayan herbs are banned for collection from the wild. There is a restriction on collection of 34 NTFPs/ medicinal and aromatic plants from the wild (GO no. 761/FRD / 15 Dec 2004) at any land. These species can be cultivated on the private land. There is no permission required for harvesting of 20 NTFP/MAP species from the forest. 28 more species have been identified for sustainable harvest from the forest. These species can be harvested as per the prescriptions of the Working Plan (WP) of the concerned Forest Division. Forests areas are usually declared as open areas for collection of certain NTFPs/ MAPs by the DFO after proper assessment and detailed terms and conditions for such harvest is determined by the Forest Department. There have been clear policies for collection, procurement and sale of important NTFPs such as Lichens, Mosses, Resins, Tejpatta, Chir Pine Knots/ stumps/barks, Yarsa Gamboo etc.

(2) Cultivation of NTFPs/ Medicinal and Aromatic Plants

The state through State Medicinal Plants Board (SMPB established in 2001), Herbal Research and Development Institute (HRDI established in 1989), and Centre for Aromatic Plants (CAP established in 2003) are promoting cultivation of 38 medicinal plants on private land.

The state government through HRDI is providing subsidy up to 50 per cent of the cultivation cost for 26 priority species and each farmer can get subsidy maximum up to INR 100,000. The HRDI is also

providing free planting materials to farmers for up to 0.1 ha area and 95% assistance for farmer clusters for setting up field distillation units. There are 20,518 farmers registered with HRDI for cultivation of medicinal plants. Estimates present that more than 3,000 ha is under cultivation of Medicinal Aromatic Plants (MAPs). During 2010-13 the production of MAPs from the cultivated land was estimated to be 2,674 MT. State Medicinal Plants Board (SMPB), along with Herbal Research Development Institute (HRDI) and Center for Aromatic Plants (CAP), has trained more than 5,000 farmers for cultivation of MAPs; there are about 27 field distillation units established in different parts of the state; revolving fund of INR 5 million has been placed with CAP for buy back of aromatic oils; minimum support price has been fixed by the Government for 20 aromatic plant produce. A list of important NTFP species is shown in **Attachment 3.5.1**.

Cultivation of Medicinal Plants in the State			
Year	No of Farmers	Production in MT	Amount in Million INR
2010-11	2471	747.02	24.96
2011-12	2205	965.95	29.46
2012-13	845	961.45	29.99
Total 3 years	5521	2674.42	84.41

Source: Bhesaj Development Unit, Dehradun

Marketing strategies

- NTFP Markets/*Mandis* at Bibiwala, Ramnagar and Tanakpur
- Open auction twice a month in each *Mandi*

(3) Marketing of NTFPs/ Medicinal and Aromatic Plants

Three *Mandis*/markets/ auction centres have been set up in 2004 at Bibiwala/ Rishikesh, Ramnagar and Tanakpur for sale of NTFPs/ MAPs from the forest as well as from the private land. This was the most important and unique initiative taken up by the Government of Uttarakhand. Uttarakhand Forest Development Corporation has been given the responsibility of management of the NTFP *Mandis* since 2004. The primary collectors, VPs, collection agents appointed by Forest Development Corporation, Bhesaj Sangh, Garhwal Mandal Vikas Nigam (GMVN) and Kumaon Mandal Vikas Nigam (KMVN) can bring the NTFPs to these NTFP *Mandis* for auction. The State Government has fixed up

floor price for different NTFPs to ensure fair auction of different NTFPs.

In case of NTFPs collected from the forests, collection agencies have to pay royalty to the Forest Department at the Range Office and take necessary permits to transport the produce from the Range to the NTFP *Mandis*. The royalty varies from product to product. In case of NTFPs/ MAPs cultivated/ harvested from the private land, the transit permit has to be obtained from HRDI/ District Bhesaj Sangh without paying any royalty. The Forest Department does not have any role to play in issuing transit permits. It is expected the farmers would bring the produce to the NTFP *Mandis* for auction but in practice it is seen that they bring the produce to the important trading centres in the state i.e. Ramnagar and Tanakpur and sell them to the private traders.

NTFPs sold in the <i>Mandis</i> (UFDC)		
Year	Production in MT	Amount in Million INR
2010-11	1590	121.11
2011-12	1802	180.16
2012-13	2929	232.62
Total 3 years	6321	533.89

Source: Forest Development Corporation

(4) Production and Marketing of some important NTFPs of the State

1) Lichens and Moss Grass

Lichens and Moss grass are the important NTFP traded in the state in terms of volume and money involved. Lichens and mosses account for nearly 99% of the total traded quantity of NTFPs in the three *Mandis* of UFDC. The total traded quantity of lichens and mosses in 2012 was 2,898 MT which amounted to INR 232 million.

Procurement of Lichens and Moss are done by 5 Agencies – Forest Development Corporation, KMVN, GMVN, District Bhesaj Sahakari Sangh and VPs. The Forest Department decides the areas to be kept open for collection of Lichens and Mosses and thereafter the State Government allots the ranges to these 5 agencies for collection of Lichens and Mosses. Each Agency engages Agents/ local traders/ contractors to collect Lichens and Moss from the primary collectors. Permit to transport the materials from the Range jurisdiction to the *Mandi* is issued by the Range Officer and necessary royalty is paid to the Forest Department. Materials are transported to the *Mandi* by the Agency or its Agents. Forest Development Corporation (UFDC) conducts auction at the *Mandi* two times in a month and payment is made to the agency after the sale and after deducting one per cent handling/ maintenance charges by the UFDC. The agents of Bhesaj Sangh have to pay 5 -10 per cent of the sale value to the Bhesaj Sangh (per cent varies from district to district). A rapid market survey report on Lichen is given in **Attachment 3.5.2**.

Lichens and moss sold in the Mandis (UFDC)

Year	Production in MT	Amount in Million INR
2012	2898.05	232.13
2011	1579.08	156.07
2010	1508.20	119.20
Total 3 years	5985.33	507.40

Source: Forest Development Corporation

2) Pine Resin

Resin is harvested and sold by the Forest Department. The Government declared an elaborate policy to deal with pine resin in 2003. The policy prescribes for departmental harvesting using rill method and open auction of resin. There is a reservation of quota for different industries i.e. 25% of the production for all India industries, 50% for Uttarakhand industries and 25% for the cooperative, khadi sector. Resin is processed by various industries to extract turpentine oil and rosin. Resin is being used by the industries dealing with varnish/polish, phenyl, agarbati, paint, paper etc. Turpentine oil is used for paints, veterinary medicines and pain killer ointments, camphor, perfumeries etc. There are 174 resin processing units in the state, out of which 98 units are functioning. The Forest Department earns good revenue from the sale of pine resin. The revenue has increased from INR 1.855 million in 1950-51 to INR 597.451 million in 2011-12. The production of resin in 2011-12 was 16,142 MT, while the production in 1950-51 was 5,454 MT. Contractors are engaged for tapping through tender and the Forest Division determines the collection price. Resin after harvesting is brought to the Forest Department depts. Located at Rishikesh, Kotdwar and Haldwani. From there it is being auctioned by the DFOs of Narendranagar, Haldwani/Nainital and Champawat Forest Divisions.

Tejpatta sold in the Mandis (UFDC)

Year	Production in MT	Amount in Million INR
2012	5.06	0.19
2011	5.33	0.14
2010	29.4	0.82
Total 3 years	39.79	1.15

Note: For 2011 data for Tanakpur mandi was not available. Source - Mandis

3) Tejpatta/ Indian Bay Leaf

Tejpatta, India Bay Leaf, considered as NTFP, is being collected and brought to the NTFP *Mandis* for auction. The production of India Bay Leaf is estimated to be around 1,300 MT and it is largely harvested from private lands and only a small quantity is coming from the forests. However, a majority of the Tejpatta is being sold directly to the traders and only a very small quantity is coming for sale at the *Mandis* and the available figures indicate that a little over 5 MT Tejpatta was sold through the *Mandis* of UFDC.

4) Honey

Honey is another important NTFP but its production from natural forest has declined and there is no information available on its production from natural forest. It is estimated that the annual production of honey from bee keeping would be about 1,500 MT. The Horticulture Department, Khadi and Village Industries Commission and some local NGOs have been playing important role in promotion of bee keeping, processing and marketing of Honey. Appropriate Technology India (ATI) has been working with 4,000 families for bee keeping and honey production. It has promoted a producer company popularly known as Dev Bhumi to process and market organic honey. So far 3,000 bee keepers have been certified as producer of organic honey.

5) Natural fibers and dyes

The state has a good diversity of fiber and dye yielding plants. It was reported that there are 95 fiber yielding plants in the forests of Uttarakhand. Most important plants are Bhimal, Bhang, Kandali (Himalayan Nettle), Agave, Bhabar grass etc. Bamboo and Fiber Development Board was set up in 2003 to promote both resource development and enterprises on bamboo and fibers. The board has been working for bamboo and ringal plantation, technology development for fiber processing, promotion of clusters on bamboo furniture and handicraft, fiber processing etc. Currently it is working in 9 clusters spread over in 5 districts. Himmothani Society, a NGO Initiated a project on fiber processing in 2010 in 29 villages in Chamoli district. Fiber User Groups have been formed with about 800 users and are engaged in production of yarn and some finished products such as scarves, stole etc. from the nettle yarn. A rapid market survey on natural fibers and dyes is given in **Attachment 3.5.2**.

6) Other NTFPs

The state has huge stock of un-utilized biomass, which can be used for fiber, dye, aromatic oil, cooking fuel etc. Initiatives have already been taken up by Bamboo and Fiber Board, Center for Aromatic Plants (CAP) and NGOs to look into various possibilities for their productive use. CAP has developed standards as well as facilities for extraction of aromatic oil from Lantana and Eupatorium. It has got very good infrastructure at Selaqui for distillation and laboratory testing. AVANI, an NGO, has established models for biomass based gasifier for production of electricity using pine needles and use of residue from the gasifier as briquettes for cooking fuel. AVANI has also used Eupatorium for extraction of dye and used it for making clothes and other items.

Yarsa Gamboo, a very high value product, does not really come to the *Mandis* for auction. Apparently small quantities are being collected and traded through illegal channel. There are other important NTFPs collected in small quantities and traded through informal trade channel.

Some of the key issues and opportunities in the industries using NTFPs have been mentioned in the **Attachment 3.5.3**.

3.5.3 List of existing facilities and Common Facility Centers (CFCs)

The state has quite a good facility for processing of aromatic oils and bamboo based crafts. There are number of NGOs, who have also set up primary processing facilities for bamboo, fibers, honey etc.

Table 3.5.2 List of facilities for processing of NTFPs in the state

Type of facility	No.	Location	Managed by	Remark
Herbal plants collection centre	60	Throughout the state	Nyaya Panchayats	These facilities are in limited use.
Storage house/ godowns	6	Bibiwala, Ramnagar and Tanakpur Mandis	Van Nigam	These storage facilities need improvement
Common Facility Centres (CFCs)	9	Uttarkashi, Chamoli, Bageswar, US Nagar and Pauri	Uttarakhand Bamboo and Fiber Development Board	CFCs have facilities for processing of Himalayan Nettle and making of bamboo furniture.
Distillation unit and Laboratory	1	Selaqui	Centre for Aromatic Plants	CAP has very good facilities for distillation of aromatic oils and lab for testing
Field distillation units	27	Different parts of the state	Entrepreneurs – local	Further study required to understand their functions and effectiveness.
Honey processing unit/ cluster	1	Chamoli	Kshetriya Shree Gandhi Ashram	Supported by KVIC
Honey processing unit	1	Dehradun	DevBhumi, ATI	There are also number of field level units for primary processing of honey
TOTAL	105			

Source: Primary market survey and consultation with different agencies. Uttarakhand Forest Statistics 2011-12.

3.5.4 List of Key Industries and Entrepreneurs

There are about 400 saw mills and 35 plywood/ veneer units in the state using the forest resources. Two paper mills including one from Uttar Pradesh are using Eucalyptus timber for paper production. There are 174 resin processing units in the state, out of which only 98 units are currently functioning.

3.6 Socio-economic Profile

3.6.1 Demographic Statistics

According to the results of the GIS analysis, the estimated total population in the 37 Priority Ranges is 2,047,136 and the total number of households is 457,254 households. The total SC population accounts for 457,576 persons (approximately 102,000 households) or 22.4% of the total population in the priority ranges, and the total ST population is 7,836 persons (approximately 1,750 households) or 0.4%.

Table 3.6.1 Demography of Priority 37 Ranges under the Project

Forest Division	Ranges	Household	Population	SC Population	%	ST Population	%
SC* Alaknanda	Aser Simli	13,791	60,260	13,392	22.2%	184	0.3%
SC* Alaknanda	Attagad	8,637	38,675	8,053	20.8%	147	0.4%
SC* Alaknanda	Tharali	11,890	54,097	12,610	23.3%	109	0.2%
CS Almora	Gananath	18,306	79,359	25,439	32.1%	221	0.3%
CS Almora	Jageshwar	10,956	52,492	13,760	26.2%	15	0.0%
CS Almora	Kosi	14,353	64,604	13,197	20.4%	526	0.8%
CS Pauri	Pabo	12,857	58,634	9,616	16.4%	33	0.1%
CS Pauri	Pauri	15,284	60,264	12,803	21.2%	171	0.3%
CS Pauri	Satpuli	9,383	35,793	10,591	29.6%	16	0.0%
SC* Lansdowne	Chalusain	6,571	25,584	5,221	20.4%	17	0.1%
SC* Lansdowne	Jaiharikhal	8,794	36,181	6,522	18.0%	49	0.1%
SC* Lansdowne	Matiyali	18,867	81,835	11,540	14.1%	780	1.0%
SC* Nainital	Mukteshwar	14,332	75,784	27,937	36.9%	147	0.2%
SC* Nainital	Okhalkanda	5,253	30,540	7,119	23.3%	12	0.0%

Forest Division	Ranges	Household	Population	SC Population	%	ST Population	%
SC* Nainital	Ramghar	13,658	64,252	20,063	31.2%	232	0.4%
SC* Ramnagar	Dhumakot	3,877	15,510	2,509	16.2%	2	0.0%
SC* Ramnagar	Nainidanda	3,749	15,658	2,896	18.5%	7	0.0%
SC* Ramnagar	Ringlana	6,191	26,759	5,928	22.2%	39	0.1%
SC* Ranikhet	Chanthria	6,164	25,902	7,144	27.6%	36	0.1%
SC* Ranikhet	Gagas	10,580	46,993	13,172	28.0%	101	0.2%
SC* Ranikhet	Gairsain	8,847	41,902	5,303	12.7%	57	0.1%
Tehri Dam-1	Dharkot Dam	13,464	57,395	11,152	19.4%	66	0.1%
Tehri Dam -1	Nailchami Dam	14,078	66,555	13,279	20.0%	31	0.0%
Bageshwar	Bageshwar	16,902	75,784	23,545	31.1%	411	0.5%
Bageshwar	Dharamgarh	12,600	53,959	15,092	28.0%	449	0.8%
Bageshwar	Kapkot	11,392	53,101	11,116	20.9%	823	1.5%
Champawat	Bhingrara	4,852	25,621	3,834	15.0%	7	0.0%
Champawat	DebiDhura	9,650	50,198	9,425	18.8%	42	0.1%
Champawat	Lohaghat	11,844	55,444	11,923	21.5%	95	0.2%
Narendranagar	Maniknath Dangchura	24,953	106,059	18,421	17.4%	204	0.2%
Narendranagar	Saklana Chamba	15,349	68,195	8,417	12.3%	155	0.2%
Narendranagar	Shivpuri	9,548	46,386	5,910	12.7%	43	0.1%
Pithoragarh	Didihat	20,893	85,385	22,113	25.9%	1,083	1.3%
Pithoragarh	Gangolihat	17,103	74,941	23,924	31.9%	25	0.0%
Pithoragarh	Pithoragarh	24,865	104,986	27,192	25.9%	526	0.5%
Mussoorie	Mussoorie	8,287	41,356	7,621	18.4%	263	0.6%
Mussoorie	Raipur	19,134	90,693	9,797	10.8%	712	0.8%
	Total	457,254	2,047,136	457,576	22.4%	7,836	0.4%

*SC: Soil Conservation Division

Source: JICA Survey Team

The demographic information for the 6 target forest divisions for Erosion Control and Sediment Disaster Mitigation Component is summarized in the table below:

Table 3.6.2 Demography of Target Divisions for Erosion Control and Sediment Disaster Mitigation Component

Division	Household	Population	SC	%	ST	%
Badrinath Forest Division	41,429	187,711	42,975	22.9%	2,280	1.2%
Bageshwar Forest Division	56,319	252,174	68,738	27.3%	1,960	0.8%
Pithoragarh Forest Division	100,258	425,594	111,750	26.3%	18,238	4.3%
Rudraprayag Forest Division	47,949	217,289	44,926	20.7%	268	0.1%
Uttarkashi Forest Division/ Uttarkashi Soil Conservation	39,884	185,355	37,123	20.0%	2,235	1.2%
Total	285,839	1,268,123	305,512	24.1%	24,981	2.0%

Source: JICA Survey Team

It should be noted that the specific sites for Erosion Control and Sediment Disaster Mitigation Component under the project are yet to be identified. Therefore, only a small part of population indicated above will be affected by the component.

3.7 Livelihood

3.7.1 Agriculture, Livestock and Horticulture

The main employment sector in Uttarakhand is agriculture. The District Domestic Product indicated 19% of the value of the total was generated from agriculture sector ranging between 6% in Dehradun

and 29% in Almora and Champawat³. Though the dependency on the agriculture sector is slightly on the decline and may not be the most productive sector, it still is the leading sector in the district level economy.

(1) Agriculture

The farming system of hills in Uttarakhand is the combination of the farming and livestock rearing and varies according to the agro ecological zone. Two cropping seasons are practiced in Uttarakhand; *Rabbi* (mid Nov – April) and *Kharif* (July – Nov). Mixed cropping was traditionally practiced in a way to minimize the crop failure and to be able to grow different varieties of grains, though such tradition is gradually take over by mono-culture farming.

Table 3.7.1 Farming System by Agro Ecological Zone

Geographic Zone	Altitude (meter)	Main farm produces and livestock
Tropical zone (A)	Up to 1,000	Wheat, Sugarcane, Maize, Mustard, Lentil Mango, Guava, Maize, Litchi, Pulses, Oilseeds, Soybean, Peach Livestock-Buffalo and cattle, Goat
Sub-tropical Zone/warm temperate (B)	1,000-1,500	Rice, Wheat, Finger Millet, Pea, Potato, Tomato, Cole crop, Pulse, Peach and Plum Livestock-Cattle, sheep, goat
Cool Temperate Zone (C)	1,500 to 2,400	Apple, Pear, Peach, Plum, Citrus, finger Millet, Pulses, Amaranth, Pea, French bean, Cole crop Livestock-Cattle, sheep, goat
Sub-Alpine, Alpine Zone (D)	2,400 and above	Amaranth, Buck weed, Pea, Apple, Potato, Cabbage Livestock-Goat, Sheep

Source: Watershed Management Directorate. (2009). Uttarakhand State Perspective and Strategic Plan 2009-27.

Although being the main source of livelihood, agriculture in the hilly area is known to be low in productivity due to the lack of access to farm inputs and irrigation. The irrigated land is 336, 136 ha, which is 53% of the net sown area and the rest is rain fed⁴. The land holding is as small as 0.68 ha in hill area, which is further divided into smaller plots in terrace, whereas the same for the plain area is 1.77 ha. This makes the mechanization of agriculture in the hill area unfeasible. Such a scenario has made agriculture unproductive and induced the migration of men for employment. As men have moved out of the villages, women had to become the de-facto head of the household and look after the domestic chores and farming activities, which increased their work load. Some would also abandon farming at once, which caused an increasing area of fallow. It accounts for 127,793 ha or equivalent to 33% of the net sown area. This further deteriorated the eco system in the region.

On the other hand, the lack of access to farm inputs has kept the farming mostly organic. This provides the community with ample opportunities for organic farming, which could be made profitable. However, the process of certification takes 3 years and will require careful planning and regular handholding by specialized personnel.

(2) Livestock⁵

Livestock play an important role in livelihood of hill communities as it provides the source of power to plough field, cow dung manure for agriculture, transportation, and milk. In the case of poultry, eggs and meat can be produced. There are 5.14 million animals including cow, buffalo, sheep, goat, pig, mule, horse and donkey in Uttarakhand. Of the total livestock population, 43.5 % are Cow followed by 26 % Goats and 23.42 % Buffaloes. A negative growth has been reported for Sheep, Pig, Horse and Buffalo population during Livestock census 2003 and 2007.

³ Directorate of Economics & Statistics. Estimate of District Domestic Product 1999/ 2000 – 2008/09. (<http://des.uk.gov.in/files/pdf/ddp.pdf> accessed on 9th September 2013).

⁴ Directorate of Economics & Statistics. (2012). Uttarakhand at a Glance (2012-13).

⁵ All figures in this section are from Livestock Census 2007 otherwise noted.

1) Poultry

Poultry has been associated with particular caste and often carried out by the households in the rural areas⁶. However, the growing urban population and changes in diet have increased the market demand. High population increase (30 to 47 %) of poultry was observed during 2003 and 2007. Especially, US Nagar has a very high poultry population of 1,290,017 followed by Nainital (424,394) and Dehradun (416,710) (Livestock census, 2007). The production so far mostly happens in large scale facility whereas backyard poultry has been identified as a potential income generation activity (IGA) for the rural households by other projects. The figures in the tables show that the egg production has grown by 40% and meat production nearly tripled between 2003-2004 and 2011-12. The challenge in poultry is to maintain the regular supply of chicks and feeds. The technical guidance for proper feeding and increasing the survival rate would be very important in addition to good market linkage.

Table 3.7.2 Trend in Egg and Poultry Meat production in Uttarakhand

	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
Egg Production (million eggs)*	184	186	187	188	191	196	253	261	271	-
Meat Production (million Kg.)*	7.2	5.8	6.2	7.3	7.8	9.6	9.9	14.24	15.74	21.57

Source: * Uttarakhand Livestock Development Board, Compiled by JICA Survey Team

2) Dairy

In Uttarakhand, livestock rearing has been part of the livelihood for long. The total livestock population in Uttarakhand has been reported to be 5,121,138 and the population is high in Pauri, Almora and Pithoragarh⁷. In the recent trend in the prices of dairy products, a potential can be seen in Dairy as an IGA.

The table below shows the trends in the milk and dairy products as per whole sale price index between 2004-5 and 2011-12 in India. The prices of both categories of the products have increased steadily from INR 100 per Kg to INR 194 for milk and INR 172 for dairy products.

Table 3.7.3 Trends in Whole Sale Price of Milk and Dairy Products in India

	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12
Milk Wholesale Index Price * (India) (Unit: INR / Kg)	100	101	109	115	123	146	176	194
Dairy products Wholesale Index Price (India)*(Unit: INR / Kgs)	100	99	105	116	123	139	152	172

* Index number of wholesale prices (India) Source: <http://www.nddb.org>

Source: Compiled by JICA Survey Team

In Uttarakhand, the production has only increased by 20% and the per capita availability of milk has not shown significant change. The value output is also increasing though this is due to the increase in the market price rather than the increase in the production volume. This suggests that it could be the result of high demand – short supply situation. An opportunity exists for the communities in the hills where the livestock rearing has been a traditional means of livelihood. Challenge would be the fodder supply and maintenance of animal health. The marketing should also require coordination among the producers in order to trade in bulk and access the market and fetch better prices.

⁶ Access Development Service (n.d.). Market Potential of Poultry in Uttarakhand. (A Study on Aajjevika poultry enterprise)

⁷ Uttarakhand Livestock Census, 2007

Table 3.7.4 Trends in Production, Per Capita Milk availability and Value of Outputs in Uttarakhand

	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12
Production* (Unit: 1,000t)	1,195	1,206	1,213	1,221	1,230	1,377	1,383	1,417
Per Capita Milk Availability per day* (Unit: Kg)	0.36	0.36	0.36	0.35	0.35	0.39	0.38	0.38
Value of Output (Unit: INR Billion) **	15.10	15.67	16.56	18.07	19.66	26.90	27.03	-

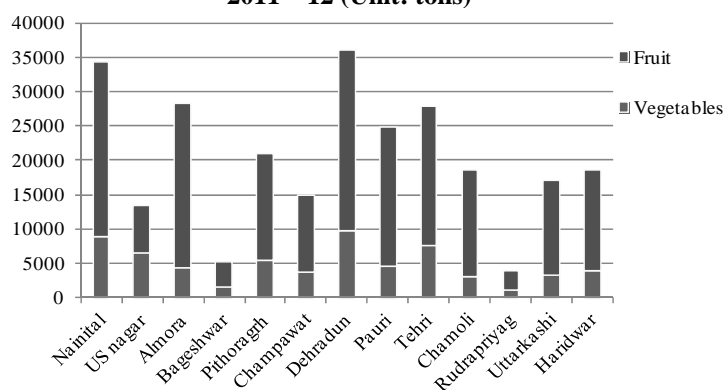
*Annual Report ULDB 2011-12; ** State wise estimate of value of output from Agriculture and allied activities 2013

Source: Compiled by JICA Survey Team

Although the dairy sector shows a potential in Uttarakhand, the shortage of feed has been commonly observed across the states. Given the fact that one of the causes of forest degradation is known to be overgrazing, an alternative feeding practice needs to be introduced when promoting dairy.

(3) Horticulture⁸

Horticulture is a prominent sub-sector in Agriculture. The variations in agro-ecological zones provide ample opportunities for production of horticulture crops. Till date, the state is known for its production of wide varieties of fruits and vegetables. 66% of the total area under the horticulture crop cultivation is fruits followed by vegetables that accounts for 31% (National Horticulture Board 2010-11). Vegetables grown in the state includes brinjal, cabbage, cauliflower, okra, onion, peas, potato and tomato. The area under horticulture crop is highest in Dehradun District reflecting its proximity to the market followed by Nainital District. On the other hand, Rudraprayag and Bageshwar Districts recorded the lowest area under horticulture crops.

Figure 3.7.1 District Wise Horticultural Crop Production 2011 – 12 (Unit: tons)

Source: Directorate of Horticulture and Food processing. Udhyan Bhawan Chokhutiya, Ranikhet Year Year 2011-12.

1) Spice Cultivation

Spice cultivation has been promoted by NGOs and other preceding projects. Spice cultivation can be practiced with small and fragmented areas and still brings reasonable income to the household. Though ginger and turmeric takes long to mature, garlic can be cultivated more than one cycle in a year. Where the crops are prone to the wildlife damage, spices also keep animals away from the area and thus, secure the yield. The data shows an increasing trend in the wholesale prices and production. However, the price fluctuates by the season and the year. The produces in the rural area is often sold to the middle men who would collect the produces from the collection point. The challenges are to supply the produces on time and to establish good market linkage, while enhancing the yield by regular technical guidance and value addition. The prices and production data for garlic and ginger are shown below.

⁸ All figures are from the District wise Fruit Production (2011- 12). Directorate of Horticulture and Food Processing. Ranikhet.

Table 3.7.5 Production of Garlic in India and Wholesale Market Price in Uttarakhand

		2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Production in India (tons) *		-	-	-	-	6,938	6,994	7,264	8,450	-	-	-
Wholesale Market Price **	High (INR/ Q)	2,783	2,270	1,624	1,351	3,551	4,019	3,970	12,344	14,420	5,208	4,284
	Low (INR/ Q)	1,233	1,103	972	3,575	1,803	1,158	831	3,952	4,133	2,328	2,309
	Average (INR/ Q)	1,753	1,536	1,233.6	1,996	3,190	1,854.9	2,273	6,441	6,434	2,852	3,149

Source: * Spice board of India 2013, ** National Horticulture Board (at Dehradun Market), *** Data till Sept.
Compiled by JICA Survey Team

Table 3.7.6 Production of Ginger in India and Wholesale Market Price in Uttarakhand

		2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013 ***
Production in India (tons)*		-	-	-	-	28,782	31,288	40,418	41,944	-	-	-
Wholesale Market Price **	High (INR/ Q)	3,335	3,364	3,938	1,852	2,200	2,252	3,950	6,623	5,817	4,665	8,268
	Low (INR/ Q)	959	1,931	1,035	984	1,288	1,378	1,720	2,399	1,790	1,728	4,951
	Average (INR/ Q)	1,831	2,431	2,302	1,410	1,673	1,785	2,589.6	3,978	3,417.6	3,149	6,472

Source: * Spice board of India 2013, ** National Horticulture Board (at Dehradun Market), *** Data till Sept.
Compiled by JICA Survey Team

2) Off Season Vegetable Cultivation

Off-season vegetable cultivation has also been noticed as profitable. Cauliflower, capsicum, French beans, tomatoes are commonly grown as off-season vegetables. For instance, the whole sale market price of cauliflower has been on the constant increase yet, the production volume has not increased significantly. Thus, the opportunity still seems to exist. The challenge will be same as the ones for spice cultivation. Access to seeds would need to be ensured in particular.

Table 3.7.7 Production of Cauliflower in India and Wholesale price in Uttarakhand

		2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013 ***
Production in India(tons)*		-	-	30.85	33.80	37.70	36.41	36.41	33.97	36.67	36.72	-
Wholesale Market Price (INR) **	High (INR/ 100kg)	1046	1315	1700	1399	2143	1761	2907	2909	3785	3973	4084
	Low (INR/100kg)	342	321	196	277	374	310	251	463	409	468	739
	Average (INR/ 100kg)	578.6	550	787.9	583	985	932	1210.5	1568.4	1607.9	2078	2224

Source: * Spice board of India 2013, ** National Horticulture Board (at Dehradun Market), *** Data till Sept.
Compiled by JICA Survey Team

3.7.2 Handicrafts and Services

According to the Planning Commission of India, handicrafts sector employs more than 6 million people in Uttarakhand⁹. In addition to rural income generation through local sales, it generates substantial revenue through exports.

In Uttarakhand, Handicrafts making (which include handlooms and khadi/ handmade cotton textile) is a traditional sector. This sector has a large rural artisan base, with mostly women involved to earn income. In Chamoli and Pithoragarh, the majority of the population engaged in handicrafts was reported to be ST population¹⁰.

⁹ Planning Commission, Government of India. (2009). Uttarakhand Development Report. Academic Foundation; New Delhi.

¹⁰ *ibid*

Earlier most of the handicraft products were for home consumption and sold at the local market. Recently efforts are being provided to diversify products targeting tourists. Issues and challenges faced by the handicraft sector include: 1) Market access, 2) access to Working Capital, 3) modern skill set and 4) Technology. With these challenges in hand, the handicrafts sector finds itself hard to survive and now in the downward trend locally. To address these issues, Government of Uttarakhand had set up an apex body namely Uttarakhand Handloom and Handicrafts Development Council (UHHDC) for the revival and promotion of handicrafts and handloom in the State.

Considering the availability of the raw material and skill set of communities in Uttarakhand, the potential enterprises for promotion can be woollen handlooms and carpets, silk textiles, bamboo and ringal products including furniture, drift wood carvings including bamboo, pine needle handicraft (using coiling techniques), pine cone handicrafts, hand loom and handicrafts products derive from 40 different natural fibers, brass ware, and apian paintings. However, the product and enterprise selection shall be made based on raw material availability, skill set and market availability at a given location.

3.7.3 Ecotourism

Consistent with its high economic growth rate during last several years, Indian tourism sector as a whole is experiencing rapid expansion. According to the Ministry of Tourism, GoI, 461.16 million domestic tourists are recorded in accommodation establishments in 2006, increased from 234.2 million in 2001, almost doubled within 5 years.

Uttarakhand is endowed with rich nature and wildlife, and a number of nature tourism destinations have been developed near the famous Jim Corbett Tiger Reserve, which is the first national park in the country. The State is also famous for its sightseeing for Himalaya and religious tourism as it has a number of Hindu pilgrimage sites. The easy access from the national capital, the State attracts a number of tourists, and tourism is one of the major industries in the State. In Uttarakhand, the tourism sector as a whole is one of the fastest growing industries, until 2010, after which the number of visitors started to decrease as shown in the table below:

Table 3.7.8 Tourist Visits in Uttarakhand

Unit: Million Persons

Year	Domestic	Foreign	Year	Domestic	Foreign
2000	11.08	0.057	2007	22.15	0.106
2001	10.55	0.055	2008	23.06	0.112
2002	11.65	0.056	2009	23.15	0.118
2003	12.93	0.064	2010	30.97	0.136
2004	13.83	0.075	2011	26.67	0.143
2005	16.28	0.093	2012	28.29	0.141
2006	19.36	0.096			

Source: Uttarakhand Tourism Development Board, 2013

The recent disaster started from June 2013 will certainly have negative impact on the sector. Asian Development Bank (ADB) has been supporting the promotion of tourism in the State and committed to provide greater support for the reconstruction of tourism sector, which was devastated by the disaster.

Regarding the ecotourism in the State, the Uttarakhand Government has been promoting it for years, as highlighted by the creation of the ecotourism wing of the Uttarakhand Government and the establishment of the Centre for Ecotourism and Sustainable Livelihoods at Chunakhan in August 2003 to promote ecologically friendly tourism in the state, which will give the employment and other direct benefits to the local people and contribute to the environmental conservation as well. Ecotourism was further proposed as part of the ten-year “Green India Mission” started in 2011. The ecotourism wing

plans to draft policies and regulatory frameworks for the development of various ecotourism activities, and a number of nature tourist sites have been developed, such as a number of national parks, biosphere conservation reserved, wildlife sanctuaries, eco-parks and forest rest houses through the initiatives of Uttarakhand Forest Department,.

- a. Tourism is a prominent sector in Uttarakhand as reviewed in the previous sections. Due- North runs an ecotourism venture with an effort to contribute to the rural development and local handicrafts. One of their initiatives is the Due North- Saur cottages, which are the restoration of the 1930's 'pahari' - an ethnic group also known as Pahari Rajputs - houses. For renovation, locally available materials were used. The village itself has been designed to display handicrafts and allows the visitors to explore the local diet. Community Members are trained to provide various services required for tourism. With assistance from National Bank for Agriculture and Rural Development (NABARD), 95 SHGs have been formed and will work on the agro processing, pine needle crafts, souvenir product development and so on.
- b. AT India started its work in ecotourism in 2004 and works in Rudraprayag and Chamoli covering 60 villages. In 2005, AT India established a retreat, Dev Bhumi Nature Retreats for the middle-upper middle class customers and Dev Bhumi Treks and Tours for trekkers.

Private sectors developed a few ecotourism destinations in the area of Binsar Wildlife Sanctuary near Almora and Triyugi Narayan Temple area in Kedarnath. These tourism initiatives adopt the concept of Community-Based Ecotourism (CBET). CBET intends to promote the initiatives of local villagers in the tourism operations through the capacity building of local communities and awareness creation of villagers regarding the ecologies and environment. The local people have greater stakes in the management of tourism facilities, handling the tourism and providing quality tourism products to the visitors. CBET generates local employment and income for the local communities in interior regions, and CBET activities usually include:

- ✓ Home stay and camping managed by the villagers
- ✓ Nature trails development and maintenance by the villagers
- ✓ Trekking, nature tour and bird watching guided and interpreted by the villagers
- ✓ Cultural events, traditional handmade products and delicacies provided by the villagers
- ✓ Development of Eco-Development Committees (EDC) and Biodiversity Management Committees (BMC)
- ✓ Community-Private-Public Partnership (CPPP) in management of tourism products and marketing

In Uttarakhand, the CBET initiatives are still in a very small scale.

3.7.4 List of Existing Facilities and Common Facility Center

In support of livelihood improvement, various departments and projects have established Common Facility Centres (CFCs). The Survey team has identified about 146 facilities in Uttarakhand. The list of facilities and their current status is as below. A comprehensive list with description of the facilities and CFCs is attached in **Attachment 3.7.1**.

Where the facilities are not functioning, the supply of the raw materials and poor management were found out to be the common issues. Such situation commonly occurs with the CFCs established for processing fruits and vegetables as their supply can be seasonal. It was also learned that the presence of the project/ facilitating agency is a key element in maintaining the level of operation of such facilities. The facilities should also be placed at a strategic location so that the raw material supply, production and marketing can be linked well.

Table 3.7.9 List of Existing Facilities and Common Facility Centers (CFCs)

Name of Facility	Promoting Program	Description	Number	Current status
Common Facility Center (Bamboo based)	UBFDB	• Established for bamboo furniture production and other activate to be undertaken by SHGs.	8	5 are functioning
Multi Utility Center	UDWDP (Gramya)	• Processing Mango pickle, Goose berry, Potato chips, Tomato sauce etc.	42	All units are operational.
Cooperative Office buildings	Canadian Center for International Studies and Cooperation (CECI) India	• Used to store seasonal vegetables and fruits, and farm tools like sprayer, sickle fertilizer and seed.	40	20 are functional.
Ajivika Vatica	UBFDB	• Demonstration centers for Bamboo and Hill bamboo plantations.	4	All functional
Central Processing Units (fruit processing/ Grinding units/ soya Milk units)	ULIPH	• Soya milk Unit, fruit processing units, and spice grinding units were established.	-	Partly functioning.
Saras marketing Centers	DRDA, Rural Development Department	• As retailing outlet of products produced at the Block (handicrafts, agriculture produces etc).	52	Functioning
TOTAL			146	

Source: JICA Preparatory Survey Team. (2013)

3.7.5 Existing Key Enterprises and Entrepreneurs and Livelihood

Uttarakhand has successful enterprises and entrepreneurs by harnessing the strengths of the rural communities and local resources. The list of key entrepreneurs and enterprises is presented in **Attachment 3.7.2**, whereas some unique and notable ventures are given below.

(1) Cooperatives

Cooperatives formed by Uttarakhand Bamboo Fiber Development Board (UBFDB) are worth mentioning as enterprises that are currently managed by the members themselves with minimum support provided by the UBFDB. They now offer training/ capacity building programs to other communities and indeed acquired capacity to manage the production, marketing and finance. HARC (an NGO based in Dehradun) also succeeded in developing a women's federation that is now require minimal support from the organization and extends training programs on agro processing.

(2) NGO launched Companies – Kumaon Grameen Udyog and DevBhumi Natural Product Producer Company Ltd.

Kumaon Grameen Udyog is a registered company established by an NGO, Chirag (Central Himalayan rural Action Group). 100% of its profit will be utilized for rural development. They manufacture hand woven and hand knitted textiles; apricot skin care products; organically grown culinary herbs, cereals and spices; and processed foods. DevBhumi is another well known company that is established by AT India. The capacity building for various livelihood activities will be done by AT-India and marketing

of the produces produced by the groups working under AT-India will be marketed through the DevBhumi Natural Product Producer Company Ltd.

3.7.6 SHGs and JLGs

In Uttarakhand, like elsewhere in India, both Self Help Groups (SHGs) and Joint Liability groups (JLGs) are promoted. Formation of SHGs and promoting bank linkages have been priority intervention in poverty alleviation in Uttarakhand. Thus, the survey team has carried out a rapid situational assessment on the status of SHGs/ JLGs in Uttarakhand and selected the mode of operation of IGAs under the proposed project. The detailed note on status of SHGs/ JLGs and micro financing in Uttarakhand is provided in **Attachment 3.7.3**.

(1) SHGs and JLGs - Comparison

For livelihood improvement interventions, activities are often implemented through groups which are known as Self Help Groups (SHGs) or through Joint Liability Groups (JLGs) which is rather introduced recently by NABARD in 2006. The former is emphasizing on the community empowerment, whereas the latter expedite the process of fund delivery to the individuals. Thus, SHGs take longer time to mature whereas with JLGs, changes can be observed within short period of time. Key differences between these two are summarized below.

Table 3.7.10 Comparison of JLGs and SHGs

	Joint Liability Group (JLG)	Self Help Groups (SHG)
Group size	• 4-10 members	• 10-20 members
Member Characteristics	<ul style="list-style-type: none"> • JLG members may be “not so poor” who may have assets. But cannot get loans because they have no papers or have problems with access of bank. • Designed for small and medium scale farmers, Oral Lessees, Share croppers, artisans, entrepreneurs. 	<ul style="list-style-type: none"> • SHG are for poor having no assets of very low productive assets. • Intended for landless labors, artisans, most downtrodden individuals of society
Savings	• Optional	<ul style="list-style-type: none"> • Mandatory • This is based on the principle of “Savings first and Credit Later”.
Loaning from the Bank	<ul style="list-style-type: none"> • Individual members or jointly by JLG • Both cases, all members are jointly liable. 	<ul style="list-style-type: none"> • Entire group. • (Inter lending will be available for members.)
Bank Account	• JLG members are encouraged to open individual accounts and are not required to keep deposits with bank.	<ul style="list-style-type: none"> • SHG needs a savings bank account in name of SHG. • They are obliged to keep deposits and transact earlier to loan.
Maximum loan amount	• Restricted to INR50,000/- per Individual	• No limit

Source: JICA Preparatory Survey Team (2013).

(2) SHGs in Uttarakhand

In Uttarakhand, a number of SHGs have been formed. They are formed to enhance the financial security but also to gain access to funds and various supporting services and training that will allow them to earn income. The table summarizes the current status of SHGs in Uttarakhand. In FY 2012/13, 57,955 SHGs have been promoted and linked with banks. Of which, 24,480 SHGs have taken loans from the banks. SHGs also have opportunities to undertake income generation activities through Swarnjayanti Gram Swarozgar Yojna (SGSY) schemes – the Government of India Initiative - through NGOs and financial institutions.

Table 3.7.11 Some information on SHGs and bank linkages in Uttarakhand

Description	2011-12	2012-13	Remark
Total SHGs (Cumulative) promoted and savings linked to Banks	48,141	57,955	
Savings amount in million INR	591.327	476.357	2012-13 – savings information is for 40,316 SHGs.
Loans issued No. of SHGs during the financial year	5,125	7,866	
Loans issued in million INR	759.296	405.022	
Cumulative no. of SHGs linked to banks for loans	25,430	24,480	
Loans outstanding in million INR	1,318.444	1,616.232	
Gross Non Performing Assets in million INR as against the total outstanding loan	93.40 (7.08%)	117.139 (7.25%)	
SHGs supported under SGSY		22,811	
SHGs – loan outstanding under SGSY in million INR		1,029.831	The loan outstanding is for 15334 SHGs.
Amount financed in million INR	236.59	337.852	As on March 2013, a total of INR 580.161 million has been financed to JLGs.

Source: NABARD

National Bank for Agriculture and Rural Development (NABARD) currently places an emphasis on promotion and financing of Women Self Help Groups (WSHG) and the scheme is being implemented by NABARD in backward districts of the country. The scheme aims at saturating the districts with viable and self-sustainable WSHGs by involving NGOs/support agencies who shall promote and facilitate credit linkage of these groups with banks, provide continuous handholding support for livelihoods.

In Uttarakhand, currently there are more than 50,000 SHGs operating throughout the state and as on March 2013, 35,001 SHGs have been linked up with the banks for financial support. Women SHG Project (special project supported by NABARD) is being implemented in Tehri Garhwal and Chamoli districts. Some key highlights of the Project have been given below:

Table 3.7.12 Status of Women SHGs (WSHGs) in Uttarakhand (FY 2012/ 13)(3) JLGs

The numbers of JLGs are rapidly increasing in Uttarakhand. Wide range of institutions including banks, NGOs, Panchayats, agriculture extension centers, cooperatives, MFIs etc have promoted JLGs. In 2010, 236 JLGs existed in Uttarakhand. The number has grown by nearly 7.5 times and was reported to be 1,777 JLGs in 2012 in Uttarakhand while the total number of India as a whole has grown only 2.3 times between 2010 and 2012.

Table.3.7.13 Status of JLGs in Uttarakhand

	2010		2011		2012	
Region	No (Unit: Groups)	Loan amount (Unit: Million INR)	No (Unit: Groups)	Loan amount (Unit: Million INR)	No (Unit: Groups)	Loan amount (Unit: Million INR)
Uttarakhand	236	6	1,541	237	1,777	242
India	141,045	11,453	191,662	17,004	332,707	28,457

Source: Puhazhendhi, Venugopalan. (2013). *Micro Finance India: State of the Sector Report 2012*. Access Publication/ Sage Publication; New Delhi.

(4) Lessons drawn from preceding experiences of SHG/ JLG models in Uttarakhand

Individual enterprise is not a stand-alone activity, but requires a suite of support services and enabling environment (forward and backward linkages), technical and management support, and etc. Particularly, non-farm IGAs such as handicrafts, handlooms need sustained value-chain development and marketing support. Cooperative/ federation or Producer's Company can create an enabling environment for the groups engaged in such IGAs.

3.8 Community Development

3.8.1 Institutional Mechanism for BHN Support and Promotion of Renewable Energy

The Basic Human Needs, such as basic education, safe drinking water, food, health care and housing provides basis for villagers to lead the productive life and attain overall well-being. As in other states in India, various services/ schemes/ programs are provided by line departments. Many of such services/ schemes/ programs implemented through Department of Rural Development are accessible through the District level Rural Development Agencies (DRDA). The initial contact should be made at the Village Level Unit, Gram Panchayat. A request submitted to Gram Panchayat will be communicated to the concerned officers at the Block Level. In the case of National Rural Health Mission (NRHM), Accelerated Social Health Activist (ASHA) posted at a village level health centre will be primary contact point who would contact the Block level staff to mobilize the service.

The programs for ST are implemented through the Department of Tribal Welfare of the State. They include conservation and developmental programs for Raji and Buxa communities mostly in Nainital, US Nagar and Pithoragarh Districts. The education programs for 1st and 10th standard and scholarships are implemented in all districts of the state. Housing scheme is also available. Individuals can approach Assistant Development Officer at the block level for an enquiry.

As for alternative energy, Uttarakhand Renewable Energy Development Agency (UREDA) will be the contact point. UREDA provides alternative energy sources such as solar lamps, cooker and lights at the subsidized rate to minimize the fuel consumption. Fuel efficient *Chullahs* are also available through various suppliers.

3.8.2 Institutional Mechanism for Basic Community Infrastructure Development

The implementation of the community infrastructure development requires support from a number of external organizations/ contractors. The figure below shows the organizational framework for supporting the implementation of the component:

The Forest Department is implementing the construction of buildings through the following options.

Option 1: If the budget within INR 500,000, it is implemented through departmentally, by the Forest Department, Govt. of Uttarakhand.

Option 2: If, the budget for construction of buildings is more than INR 500,000 between INR 3,000,000, then the works undertaken by Public Works Department (PWD), Government of Uttarakhand.

Option 3: If the budget for construction of buildings is more than INR 3,000,000, then it goes to the open tendering / bidding procedure as per Government of Uttarakhand. PWD is also doing the work through open tendering or bidding procedure.

For smooth implementing of the construction of buildings, suggesting the following procedure;

- 1) Organize state-level workshop on various civil construction works like repair and maintenance or extension of DMU building, repair and maintenance or extension FMU Building, VP Ghar etc.
- Finalize methodology and operational guidelines for undertaking civil works in DMU and FMUs

- Finalize methodology and operational guidelines for undertaking civil works in VP Ghar – Office cum meeting hall.
- 2) Preparing Terms of Reference (ToR) for Technical Supporting Agency to Forest Department for finalization of process of construction, use of eco-friendly building materials, use of eco-friendly technologies, quality control mechanism.etc. according to the state level workshop.
- 3) Collection of site-specific data and finalization of the design type to be adopted for the site after finalization of site map and soil exploration studies for foundation designing with GPS readings.
- 4) Preparation of ‘Type Design’ and ‘Cost Estimates’ for the final approved design for implementation.
- 5) Procure Contractors / Bidders for undertaking the work as per finalized design through the proper procedure maintained by Forest department as per Govt. of Uttarakhand.

3.8.3 EPAs of Other Projects

Entry Point Activities (EPAs) have been commonly carried out at an early stage of the projects in order to initiate the project implementation and to build a rapport between the project and the participating communities in the project. The list of activities carried out by various projects and organizations are summarized below.

The drinking water related activities, common facility centers were constructed by four projects. Three projects/ organizations have conducted vermin composting. All the activities were selected by the community members for the benefit of their community.

The result of the Impact assessment of the EPAs carried out under the Forest Development Agency (FDA) suggested that many of the EPAs can be carried out by District Rural Development Agency (DRDA)¹¹ through convergence and thus, the role of Panchayats become important in this process¹². The same report also suggested that the EPAs did contribute to the improvement of the living conditions in the project area, whereas the interest of the people towards the project did not seem to be generated as anticipated¹³. Commonly proposed EPA under FDA was road repair. Purchasing of utensils, furniture etc were suggested to be unsuitable for EPA as the whole community is less likely to be benefited.

Table.3.8.1 Entry Point Activities of Other Projects

EPA	Projects								
	UBFDB	CBED	UDWDP	ULIPH	UOCB	CAPA	DRDA	FDA	Counts
Drinking water related activities			X	X		X		X	4
Community meeting shed/ hall, Common Facility Centre	X	X	X	X					4
Vermi Composting			X	X	X				3
Rural Market (Saras Centers)				X			X		2
Fodder Cultivation (Grasses and Trees)			X	X					2
Cattle Feeding Fodder Bank			X	X					2

¹¹ District Rural Development Agency is an agency placed at District level placed by the Department of Rural Development for supervision of the poverty alleviation programs.

¹² National Afforestation & Eco Development Board, Regional Centre. (2007). Impact Assessment of EPA Component in FDA Projects under the NAP Scheme in the States of Rajasthan, Uttar Pradesh, Haryana and Uttarakhand with Specialist Emphasis on Benefits to the Poor.

¹³ *ibid*

EPA	Projects								
	UBFDB	CBED	UDWDP	ULIPH	UOCB	CAPA	DRDA	FDA	Counts
Road Repair								X	1
Repair of Temple								X	1
Renovation of Panchayat building								X	1
Irrigation Tank								X	1
Bathroom								X	1

Source: Compilation from various project documents, JICA Survey Team (2013)

3.9 Local NGOs

The number of NGOs in Uttarakhand registered with the GoI NGO Partnership¹⁴, an initiative of Planning Commission, was 680 NGOs. All of them were registered under Society's Registration Act 1860. It is a common practice in Uttarakhand to involve NGOs in the project implementation for community mobilization, training, implementation of project activities and monitoring. The number of NGOs involved under the various programs/ organizations are as below.

Table 3.9.1 Involvement of NGOs in other Projects

Programs	No of NGOs	Tasks of NGOs
FDA	2	• Monitoring and Evaluation of the NAP activities
ULIPH	30	• Village selection, PRA, community mobilization • Capacity building of community • Bank linkages and networking • Cluster level cooperative formation • Implementation of project activities at Group and cluster
UDWDP	8	• Field NGO (2): Community mobilization and micro finance, bank linkages. • Partner NGO (2): Enterprise development Support. • Divisional Support Agency (4): Formation of Farmer Interest Group, promotion of cash crops, federation development, Agriculture level technical trainings, and agribusiness support
UOCB	10	• Village selection and community mobilization for organic production. • Facilitate organic certification process. • Community mobilization for Group and federation development.
UBFDB	8	• Community mobilization, Group formation. • Conduct skill development activities for artisans. • Training on federation management. • Establishment of Ajivika Vatica (A kind of communal plantation for livelihood) and CFC.

Source: Interview Results. JICA Survey Team (September 2013)

The projects/ organizations interviewed agreed that the involvement of the NGOs is an integral part of the project implementation process. Especially when it comes to the community mobilization or activities to be done through participation of the community members, engaging the NGOs especially from the local areas would be helpful. However, they also pointed out that the Terms of Reference (ToR) and selection criteria need to be clearly defined otherwise, the project will not be able to capitalize on their capacity. Especially the UKFD staffs are less likely to have the sufficient exposure in the participatory mode of project implementation, engagement of NGOs could be helpful. The list of NGOs suggested by other projects/ organizations interviewed is attached in **Attachment 3.9.1**.

¹⁴ Source: http://ngoindia.gov.in/state_ngolist_ngo.php (accessed on 4th September 2013).

3.10 Protected Areas, Wildlife and Biodiversity and Community-level Institutions

In Uttarakhand, the variation in the landscape has created great diversity of flora and fauna, and consequently, resources. These are spread over a landscape that includes plains country where the tall Sal trees and myriad other plant species hold sway. Tigers, Elephants, Deer, Antelopes, King Cobras, Pythons, a large number of bird species, amongst so many other animal species, inhabit these forests, bush and grasslands. The Himalayas to the north of the plains country are covered with the green of pines, cedar, fir, oaks etc. and during part of a year, blushes of rhododendrons cover the slopes of our hills. Above the tree line are found the grasslands, locally called *bugyals*, and beyond them the perpetual snows rise way beyond 7,600 meter above mean sea level. Wildlife like Leopards, Snow Leopard, Himalayan Black Bear, Brown Bear, Musk Deer, many wild fowls are some of the representatives of rich wildlife inhabiting these forests. The mighty, crystal clear rivers and lakes that have a rich aquatic biodiversity, including some of the best game fishes of the world, including the trout and the magnificent Mahseer.

There are 7 Wildlife Sanctuaries, 6 National Parks (including 1 Tiger Reserve), 1 Biosphere Reserve and 2 Conservation Reserves in the State all of which are under the control of UKFD. The major sanctuaries and reserves of the area are Jim Corbett National Park, Valley of Flowers National Park, Govind National Park, Nanda Devi National Park, Rajaji National Park and Assan Barrage Bird Sanctuary. Jim Corbett National Park is one of the most famous protected areas of Uttarakhand as the first National Park in the country. The Nanda Devi National Park & Valley of Flowers have been named as a UNESCO World Natural Heritage Site. Some of the major Protected Areas are listed in the table below:

Table 3.10.1 Major Protected Area (PA) in Uttarakhand

Name of PA	Description
Jim Corbett National Park	Jim Corbett National Park used to be just another Himalayan forest until in 1936 when it was demarcated as a reserve area by the British Government as the first National Park in the country. Jim Corbett Park is spread over 52,000 ha and is covered with huge stretches of Savannah type grasslands and Sal forests.
Nanda Devi National Park	Nanda Devi National Park along with the nearby Valley of Flowers was made a UNESCO World Heritage Site in 1988. Nanda Devi National Park is a forest reserve cum national park (established 1982) in the area surrounding the Nanda Devi park and covers an area of 63,000 ha.
Valley of Flowers	Valley of Flowers is as full of flowers as of exotic animal species and birds. It is a sight to watch, explore and absorb. The valley is a riot of colors and fragrances so unique and exotic that one needs an entire day just to take in whatever nature is giving us that time.
Rajaji National Park	Rajaji National Park was established in 1983 amidst the bio diverse area of the Shivalik Hill range on the Himalayan foothills. The national park's name has been dedicated to C. Rajagopalachari, fondly known as Raja Ji.
Govind National Park	Govind National Park, also known as Govind Pashu Vihar, was established to save the increasingly endangered species. This sanctuary is spread over an area of 95,797 ha with a varying altitude of 1,300 m to 6,323 m.
Assan Barrage Bird Sanctuary	Assan Barrage was established in the year 1967 as a small man-made wetland at the convergence point of Rivers Yamuna and Asan in Dehradun. Since it is near to Dhalipur power house, it is also known as Dhalipur Lake.

Source: JICA Preparatory Survey Team

After becoming a party to the Convention on Biological Diversity (CBD) in 1994, the GoI has taken many important steps to strengthen the existing framework for conservation of biodiversity. In 2002, GoI enacted the Biological Diversity Act, which provides for the conservation of biological diversity, sustainable use of its components and equitable sharing of the benefits arising out of the use of biological resources, knowledge and matters connected therewith. India's biodiversity is undoubtedly more vulnerable to threats of bio-prospecting and bio-piracy. This Act has been enacted initially mainly to check the runaway theft of the country's genetic wealth and traditional knowledge and also to ensure that both domestic and foreign users of these resources do so in a manner which is sustainable and fair. To implement this Act, "National Biodiversity Authority" and "State Biodiversity

Board” have been constituted. The third tier of authority is biodiversity Management Committee at each local body (i.e. Gram Sabha/Municipality/Nagar Palika) level. The “Uttarakhand Biodiversity Board” (UBB) has been constituted in 2006 in Uttarakhand for this purpose.

Wetland

The wetlands exhibit enormous diversity depending upon their genesis, geographical location, water regime and chemistry. Wetlands are one of the most productive ecosystems and play crucial role in hydrological cycle, and directly and indirectly support millions of people in providing several services including flood control, clean water supply, food, fiber and raw materials, scenic beauty, educational and recreational benefits.

Aware of their importance, GoI has formulated several policies and plans for the conservation and preservation of these crucial ecosystems. Realizing the need of an updated geospatial database of these natural resources as the pre-requisite for management and conservation planning, National Wetland Inventory and Assessment (NWIA) Project was formulated as a joint venture of Ministry of Environment & Forestry, Government of India, and Space Applications Centre (ISRO).

Under the NWIA Project Wetland Atlas of Uttarakhand has been prepared by the Space Applications Centre (ISRO), Ahmedabad and Uttarakhand State Space Application Centre, Dehradun (www.sac/epsa/abhg/nwia/atlas/24/2010). The Atlas includes district-wise maps of the wetlands and statistics of various types of wetlands, extent of water, aquatic vegetation and turbidity in pre and post monsoon period. According to the map, total 994 wetlands, including 816 small wetlands (<2.25 ha area) exist for 103,882 ha (1.92% of total area of State), of which 29 wetlands and 118 lakes are located at above 3,500 m (142 ha) and above 3,000 m respectively.

Table 3.10.2 District-wise Wetland in Uttarakhand

	District	Wetland Area (km ²)	% of Total Wetland Area
1	Almora	33.26	3.20
2	Bageshwar	21.87	2.11
3	Chamoli	32.40	3.12
4	Champawat	32.33	3.10
5	Dehradun	104.32	10.04
6	Haridwar	124.80	12.01
7	Nainital	138.35	13.32
8	Pauri Garhwal	146.31	14.08
9	Pithoragarh	60.23	5.80
10	Rudrapur	17.02	1.64
11	Tehri Garhwal	41.73	4.02
12	U. S. Nagar	200.99	19.35
13	Uttarkashi	85.32	8.21
	Total	1,038.82	100.00

Source: State Biodiversity Board

Sacred Groves

Sacred Groves are small patches of forests left untouched by the local inhabitants. These groves are protected by the people of the surrounding areas to avoid the nature’s wrath and to seek the blessings of their resident deity. Sacred groves are the last remnants of native vegetation of each particular region and are rich in biodiversity. They probably indicate the heroic efforts made by local communities to protect and preserve their natural forest tracts against the onslaught of clearing of forests, cultivation and settlement. The fundamental consideration for declaring a forest as a sacred grove is to extend the control of the community not only on the forest but also on the individual.

In the sacred groves, all forms of vegetation including shrubs and climbers belong to the deity. Grazing and hunting are prohibited and only the removal of dead wood is permitted. During the course of transition from hunter-gatherer lifestyle to the agrarian settlement, the customary use of nature was governed by traditional systems of resource use and conservation, involved a mix of religion, folklore

and tradition regulating both quantum and the form of exploitation. Since ordinary belief did not have a deep impact, various taboos were evolved to instill fear and reverence into the people to conserve biodiversity resources of the grove.

Section 37 of the Biodiversity Act 2002, provides for the creation of Biodiversity Heritage Sites (BHS) by the State government. As communicated by UBB, in Uttarakhand, it has been estimated that there are 168 potential BHS sites, which may be declared as BHS. On the basis of a preliminary assessment, process of notification for 7 sacred groves outside RF areas and 6 sacred groves inside RF areas is underway.

Table 3.10.3 Summary of Existing/ Identified Sacred Grove in Uttarakhand

	Name	Location	Area (acres)
	Chamoli District		
1	Ghanteyal ki CHEevi, Devika Mandi	Badeth	500.00
2	Ghandiyal Devataka Van	Majyanitali	0.50
3	Laxmivan, Manda aur Ghantakaran ki Phulwari	Mana	500.00
4	Nanda aur Ghantakaran ki Phulwari, Laxmivan	Mana	2.50
5	Amdar ki Kyor, Surai ka Ped, Panayaltha Jaisort	Anusuya	1250.00
6	Fulana (Chinap Sink Bugyal), Jaldhara, Mandir ke Ped	Thaing	250.00
7	Nanda ki Phuwari, Bugyal, Mandir ke Ped	Bhundar	3.00
8	Bugyal, Nanda ki Phulwari, Mandir ke Ped	Bhundar	-
9	Thai	Irani	250.00
10	Sivalaika Jungle	Irani	2.00
11	Bhagwatika Jungle	Irani	3.00
12	Saimyar	Irani	0.50
13	Anand Van	Irani	2,500.00
14	Kotgadi ki Kokila Mata ka Sthan	Madigaon	1.00
15	Kotgadi Devi ke Samrakshit Van	Madigaon	50.00
16	Pravasi Pavasu Devata	Deuti	500.00
17	Devrada	Koti	250.00
	Pithoragarh District		
18	Thal Ke Dhar	8 km from Pithoragarh	1,315.60

Source: State Biodiversity Board

Biodiversity Management Committee (BMC) and People's Biodiversity Register (PBR)

Under Section 41(1) of the Biological Diversity Act, 2002 and Rules 2004, every local body in the State (i.e., Gram Shabh/Gram Panchayat/ Municipality/ Development Block/ District) shall constitute a Biodiversity Management Committee (BMC) within its area of jurisdiction for the purpose of promoting conservation, sustainable use and documentation of biological diversity including preservation of habitats, conservation of land races, folk varieties and cultivars, domesticated stocks and breeds of animals and microorganisms and chronicling of knowledge relating to biological diversity.

The main function of the BMC is to prepare People's Biodiversity Register (PBR) in consultation with the local people. The PBR shall contain comprehensive information in the prescribed format on availability and knowledge of local biological resources, their medicinal or any other use. The PBRs shall be maintained and validated by the BMC. The Guidelines for the preparation of PBRs issued by the National Biodiversity Authority provides 31 formats or categories under which data has to be recorded. The preparation of a PBR is a participatory process. It involves a detailed consultation with all stakeholders involved, particularly the local people, who need to share their common as well as specialized knowledge.

In Uttarakhand, 673 BMCs have been formed, and 13 PBRs have been prepared in the following Development Block and Gram Panchayats:

Table 3.10.4 Status of PBR Preparation

Development Blocks Level PBR prepared	Medicinal Plant Conservation Areas (MPCAs) with PBR (Gram Panchayat level)
Purola (Uttarkashi)	Kandara (Uttarkashi),
Didihat (Almora)	Jhuni (Bageshwar),
Okhalkanda (Nainital)	Mohan/Taram (Almora),
Raipur (Dehradun)	Khaliya (Pithoragarh),
Tadikhet (Pithoragarh)	Gangi (Tehri Garhwal),
Khirsu (Pauri)	Bastiya (Champawat)
	Mandal (Chamoli)

Source: State Biodiversity Board

3.11 Recent Natural Disaster

3.11.1 Outline

The early monsoons have brought misery in the life of the people in Uttarakhand, especially in the districts of Rudraprayag, Uttarkashi, Chamoli, Pauri and Tehri. The State of Uttarakhand has been severely affected by floods and landslides following the torrential rainfall in the region since Friday, 14 June 2013. Incidents of Cloudbursts and landslides across the state have led to the current death toll being raised more than 1,000 in the region. Increasing levels of water in two main rivers of the State, namely Alaknanda and Bhagirathi, have also resulted in the collapse of bridges, and damaging and washing away of property which has not been estimated yet.

More incidents of cloudburst are reported in the districts of Pauri Garhwal on June 24. Due to continuous rainfall in Uttarakhand since Friday (14th June 2013) resulting in increase of water level and flow of two main rivers of Alaknanda and Bhagirathi. Incidents of cloudburst, flash flood and landslides at various locations have also triggered the impact causing to loss of life, damages to property and road block in the state. The rainfall ranged between 50mm to 500mm till 16th June. Rescue operations by Army personnel continued while many people remained stranded.

3.11.2 Disaster Scale

The extent of damage reported by the State Government as on 20.07.2013 is as shown in below.

Table 3.11.1 Condition of Damage

No of Districts affected	13
No of villages affected	1,603
No of human lives lost	580*
No of body recovered	249
No of injured	4,473
No of missing as on 30.07.2013	5,474
Lives stock lost	9,470
No of houses damaged	4,726
Cattle shed damaged	649
Pilgrims stranded at various places	All the pilgrims have been evacuated #
No of persons rescued to safer places as on 02.07.2013	108,653

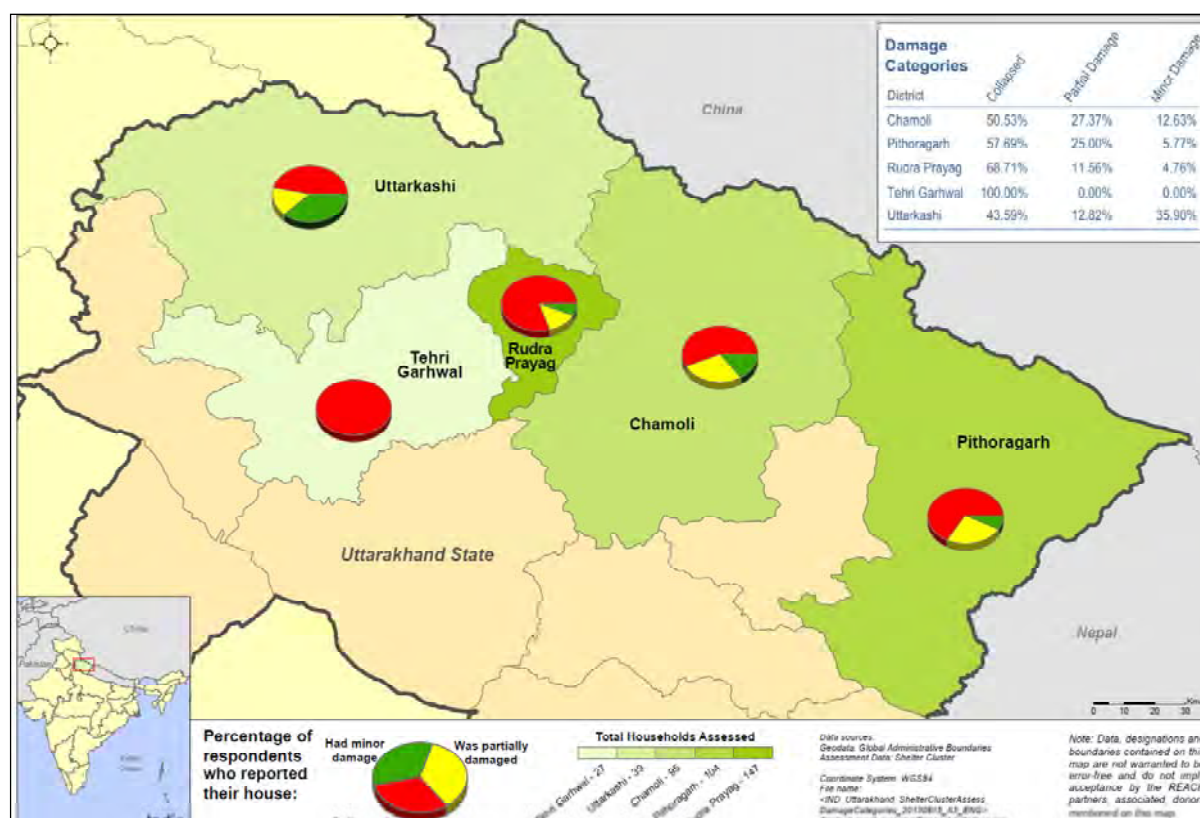
* Including 20 victims of helicopter crash.

It must be taken into cognizance that many persons would remain at Badrinath, Gaurikund and Yamunotri till the holy doors of respective dham get closed till second or third week of November 2013.

*** Figures are provisional and gathered from various sources. These are likely to change as further information is received from various sources.

Damage on shelters is shown in Figure 3.11.1. It shows the Tehri Garhwal was the worst hit by the disaster resulting 100% collapse of the shelters. Rudraprayag had the second highest incidences of the

collapsed shelters (68.71 % collapsed). Nearly half of the shelters have collapsed in Chamoli, Pithoragarh, and Uttarkashi.



Source: Sphere India <http://www.sphereindia.org.in/>

Figure 3.11.1 Shelter Damage Categories

3.11.3 Road Damages

The road subsector in the State comprises of road infrastructure, which is primarily administered by the Public Works Department (PWD).

The PWD is responsible for planning, financing, constructing, and maintaining roads, bridges, and related government buildings.

The disaster has caused damages of about 2,174 roads, 85 motor bridges and 140 bridle bridges and connectivity to about 4,200 villages. A large number of vehicles have been washed away, buried under debris, fallen off the hill, or stranded at cut-off locations.

Table 3.11.2 Summary of Damage to Border Road Organization (BRO), National and State Road Infrastructure

Districts	Roads with BRO	National Highway	State Highway
Part A-Worst affected Districts	935.00	61.18	253.00
Part B-The other Eight Districts	161.00	248.25	787.40
Grand Total- A and B (km)	1,096.00	309.43	1,040.40

Source: Government of Uttarakhand State

Out of the total number of 2,174 closed roads, 1,784 roads have been restored. The connectivity to 3,771 villages out of the total number of 4,200 cut-off villages has been restored. However, the current restoration of connectivity is only through temporary measures so as to facilitate the movement of vehicles, people and animals.

Table 3.11.3 Summary of District-Wise Damage to Other Road Infrastructure

Districts	Main District Road (MDR) (km)	Other District Road (ODR) (km)	Village Roads PWD (km)	Village Roads – PMGSY ¹ (km)	Bridle Roads (km)	Motor bridges (nos)	Bridle Bridges (nos)
Part A-Worst affected Districts							
Bageshwar	75.00	55.0	79.09	25.50	6.00	1	18
Chamoli	86.00	124.00	253.61	69.86	76.40	1	26
Rudraprayag	27.00	24.00	143.38	81.47	31.15	4	25
Uttarkashi	81.00	12.00	389.91	49.33	49.30	7	12
Pithoragarh	17.00	-	250.61	20.77	108.5	2	26
Total	286.00	215.0	1116.6	246.93	271.4	15	107
Part B-The other Eight Districts							
Almora	169.00	178.50	66.91	23.56	-	-	3
Champawat	12.00	7.00	261.38	20.65	-	-	-
Dehradun	79.60	47.60	439.52	30.02	-	31	2
Haridwar	47.00	17.30	49.00	-	-	2	-
Nainital	37.00	6.00	180.48	22.51	27.00	-	-
Pauri	88.00	120.00	964.14	101.57	5.6	2	7
Tehri	82.00	79.00	769.39	40.39	132.4	35	21
US Nagar	6.00	1.00	215.55	-	-	-	-
Total	520.6	456.4	2,946.37	238.7	165.0	70	33
Grand Total-A and B	806.6	671.0	4062.9	485.63	436.4	85	140

¹PMGSY: Pradhan Mantri Gram Sadak Yojana is a centrally funded scheme to provide all weather connectivity.

Source: Government of Uttarakhand State

3.11.4 Damages in Forestry Sector

Some forest areas, including tree cover, grasslands and high altitude pastures have been washed away and there are intermittent losses to forest patches in the worst-hit districts of Uttarakhand.

Almost 1,000 km length of forest road (inside forests) and about 2,500 km of bridle paths are reported to be damaged that require urgent reconstruction.

Several residential and office buildings/structures (about 200), log bridges, other temporary bridges and culverts (totaling about 76), soil and moisture conservation structures like check dams, retaining walls, gully plugs, river training works, etc. and nurseries (63 ha) and plantations (247 ha), have been damaged and need to be reconstructed and/or repaired urgently.

Table 3.11.4 Damages Incurred to the Forest Infrastructure

	District	Residential Bldgs (No.)	Non-Residential Bldgs (No.)	Forest Motor Roads (Km.)	Bridle paths (Km.)	Bridge/Culverts (No.)	Nurseries (ha.)	Plantations (ha.)	Other Works (Soil & Water Conservation, etc.) (No.)
1	Bageshwar				2			7	
2	Chamoli	24	12	0	434.4	5	17	4	209
3	Pithoragarh	5		18.93	77.01			9.5	
4	Rudraprayag	18	0	5.15	229.5	3	0	0	4
5	Uttarkashi	35	10	93	1,308.3	47	28	43	44
6	Almora			24.5	9			2.5	
7	Champawat			28	121				
8	Dehradun	37	4	271.5	28	4	0	85.5	500
9	Haridwar	13	0	137.6	0	4	2	13	492
10	Nainital	0	0	150	0	0	0	0	0
11	Pauri	4	9	198.1	111.5	0	4	0	450
12	Tehri	12	15	26	223.9	12	12	83	88
13	US Nagar	1		45.5		1			
	Total	149	50	998.28	2,544.61	76	63	247.5	1787

Source: Government of Uttarakhand State

Chapter 4 STAKEHOLDER CONSULTATION

The UFRMP Preparatory Survey Team has organized a stakeholder consultation with key stakeholders who were likely to be affected by or involved in the proposed initiative. The objectives of the consultation workshop are summarized in the table below.

Table 4.1.1 UFRMP Preparatory Survey Stakeholder Consultation Workshop Overview

Workshop Date/ Venue	9 th October 2013/ Venue: UKFD Meeting Hall
Workshop Goal/Purpose:	<ul style="list-style-type: none"> To introduce the project's key features, goals, objectives and component activities to the civil society and other stakeholders to receive feedback from participants on the overall project design, proposed activities and institutional arrangements To share basic project approach particularly for area selection, livelihoods including NTFP activities etc., environment and social safeguards, and transparency and to receive feedback for improvements
Participants:	Relevant state-level UKFD staff, other government departments, non-governmental organisations, private partners, etc.

Source: JICA Survey Team

The stakeholder's consultation was organized on 9th of October, 2013 at UKFD, Dehradun. Out of 76 organizations invited, 24 organizations were represented by 29 participants coming from different areas and skill background. The minutes of meeting and a list of participants is found in **Attachment 4.1.1** and **4.1.2**. The discussions were held following the presentation given by the Survey Team especially in the areas of overall project design, proposed activities and institutional arrangements and on livelihoods including NTFP activities etc., environment and social safeguards, and transparency and Monitoring and Evaluation. The following table summarizes the key discussion points that were deliberated during the workshop.

Table 4.1.2 Summary of the Points Discussed at the Stakeholder Consultation Workshop (9th October 2013, Dehradun)

Questions/ Suggestions	Relevance to the Survey/ Project Design
Bhagirathi valley (<i>Ghati</i>) region has huge tracts of degraded forest land and with recent flood disaster it needs enormous eco-restoration action. Chinayalisaur falling in district Uttarkashi is also an eco-fragile zone. The project should identify and include more degraded forest land.	Only part of Tehri (Tehri Dam-I), which overlaps with the suggested location is included. JICA project will not be able to cover the entire degraded forest in the state considering the budget and implementation reality. Government of India (GoI)/ other external funds have already identified Tehri Dam and Uttarkashi as high priority areas for eco-restoration, and to avoid duplication such areas have not been included.
Land holdings with Van Panchayats (VPs) are generally small and largely degraded, and in such situation the impact of the project will not be in large scale as projected. More VPs should be added and focus should be provided for capacity building; and the project should handhold them in implementation and management.	Activities will be implemented with a proper micro planning targeting VPs in batches for the project intervention so that the local needs and capacity building activities are addressed.
What are the identified areas and what is the mechanism for implementing eco-tourism intervention?	Eco-tourism activity will be only focused in a selected potential area – which will evolve out of micro-planning. Eco- development Committees (EDC) and Biodiversity Management Committee (BMC) will be created and/or strengthened. Since there is no validated model, the project would adopt a flexible approach in area selection and support and it would evolve based on learning.

Questions/ Suggestions	Relevance to the Survey/ Project Design
The project should focus on gender aspects and involve more women giving emphasis to ST/ SC/ Bellow Poverty Line (BPL) families. In the state large number of SHGs are created by different agencies, but lacks handholding and promotion support. The project should focus on capacity building of the existing SHGs rather than forming new ones.	Note was taken for considering while suggesting the strategy and options for livelihood.
Under various projects, huge amount of plantation had already been done, but the success and economic returns are limited. As the project is considerably long term (8 years), focus should be provided on the outcomes (success and economic returns) rather than on the outputs like hectare planted, SHG formed, etc.	The aim of the project is to rehabilitate and eco-restore the degraded land. Plantation target is very low and the project would focus on success of plantation and long run sustainability.
Interventions proposed (such as formation of SHG, federation, market feasibility and access to micro-credit, etc.) are not new to the people in the state, many programs are either on-going or completed with the same mandate. The critical issue is that once the project is complete all the intervention as well as enterprises are not sustainable/ become non-functional. So, what is the mechanism to ensure long run sustainability of the project?	Project will adopt an inclusive approach and will address all aspects needed for successful enterprise – participatory micro planning, awareness and sensitization, study tours, enterprise infrastructure, skill development, market linkages, technology transfer, working capital needs as well as raw material resource development. NTFP Center of Excellence (NCE) is proposed under the project which will act a marketing hub focusing mainly on marketing of produce within the state
Looking at the larger scale or bigger picture, the problem lie in creation of proper infrastructure, policy guidelines, and need for constant advocacy to create a proper business environment. The project should also work towards addressing and creation of enabling policy environment and provide guidelines for up-scaling of interventions during and after the project phase	Note was taken.
Last mile accessibility and connectivity is a bottleneck in interior hill area and proposed that sub-clusters and cluster formed should be linked to federations and collectively addressing the problem/ issue of the villages associated with it. A mechanism for disseminating market information and linkages and disaster information should be developed and validated with the use of modern communication tools such as mobile phones, etc.	Note was taken, and project proposals already have addressed many of the issues highlighted.
Higher value addition and incremental income to women should be given priority. In addition to conversion of pine needle to energy (a very low value addition), there is a larger window of opportunity exist to convert the pine needle and cone to high value handicrafts products and souvenirs. This will be an opportunity for women to be at home addressing household chores and earning additional income for addressing homes food security, children education and health needs.	Note was taken, and project proposals already have addressed many of the issues highlighted.
The project should incorporate the following interventions (a) generating database of all the traditional healer in the state; work on capacity building, strengthening so that they can earn their livelihood from the activity; (b) promote traditional and organic food (millet etc.), (c) Village level shelter for addressing disaster issue and (d) solar energy should be promoted which has huge potential in lights,	Note was taken, and project proposals already have addressed many of the issues highlighted.

Questions/ Suggestions	Relevance to the Survey/ Project Design
<p>cooking etc.</p> <p>Uttarakhand Renewable Energy Development Agency (URED) highlighted the potential and possibilities of solar and renewable energy for fiber extraction, cooking, household / commercial lights etc.</p> <p>In addition, he mentioned that URED can also provide training to the local youth and mechanics for repairing solar equipment, a source of income.</p>	
To incorporate <i>ringal</i> handicrafts as the livelihood generation activity because it is been practiced by artisans since generations as their traditional craft and it has a larger potential.	Note was taken.
Opined that the livelihood issue is extensively dealt in the project whereas Man-Animal conflict is neglected.	Note was taken, and project proposals already have addressed the highlighted issue.
<p>One should first understand the requirement of the village and communities prior to the interventions. It is generally observed that what is required is not delivered to them.</p> <p>With reference to the medicinal plants, the market is not an issue. Quality of the produce and linking the producer groups to market is the major areas which need to be addressed.</p> <p>We need to strengthen the in-house capacity as there are 193 registered pharmacies which require produce on a regular basis.</p> <p>Another drawback is the strategic positioning of the sufficient produce which is very crucial to generate regular income for the communities associated, linking them to indigenous brand like HIMADRI (for promotion of Uttarakhand products).</p> <p>The enterprises should run as “For Profit enterprise” or in business mode and not in traditional beneficiary model adopted by most development agencies.</p>	Note was taken, and project proposals already have addressed many of the issues highlighted.
<p>It is necessary for the project to building technical and management capacities of the VPs and handhold over a long time frame.</p> <p>In addition, provisions for working capital/ seed money/revolving fund should be provided to make them financially capable and independent to take up various IGA proposed under the project</p>	<p>The missing link (produce and market) and to create a critical mass: SHG/producer group-cooperative-federation model will be adopted.</p> <p>The financial capacity of the VPs will definitely be upgraded for its long term sustainability but right now it is in preparatory phase.</p>
The role of non-governmental organization (NGO) is vaguely defined and they opined that NGO's should not be used only as human resources service providers and grass root community mobilization, but they are looking for a larger role in project implementation.	The role of a NGO will depends on the expertise, capacity and prior track record. Considering these factors, NGO partnership and involvement will be both – service providers as well as deliverable based assignments.
<p>It is necessary to establish and follow an effective and transparent system at all levels of the proposed institutional mechanism for the smooth implementation of the project.</p> <p>If the indicator or parameters for Monitoring & Evaluation (M&E) are not clear to the implementation agencies at the preliminary phase, it would have an impact on the output/ results of the project.</p> <p>The main issues would be fund flow and information dissemination. The forest department, being a government department, is involved in bureaucracy and delays in fund releases. Therefore, the project should have a separate bank account for uninterrupted</p>	Preliminary parameters or indicators are suggested and included for the components of the project. More indicators would be evolved adopted at the time of implementation. Sound fund flow is suggested and separate bank account for smooth flow of funds is already proposed.

Questions/ Suggestions	Relevance to the Survey/ Project Design
and uniform flow of funds. VPs should be consciously involved in decision making, and in addition there is a need to build their capacities for effective project implementation. At the Divisional Management Unit (DMU)/Field Management Unit (FMU) level risk exists in altering the outcome and/or outputs. For that there is a need to develop a set of rules and regulation.	Decentralized planning process would be adopted where VPs would evolve their own micro-plans and would take key decisions in implementing and managing project funds, and would perform their functions according to VP Rules 2005. Operation Manual would clearly define roles, responsibilities and processes, and would be developed prior to initiation of implementation and adopted after approval for highest decision making body.
The committees / units created under the project do not have representation from social development background, academic institution and from VPs, who can understand the need of the beneficiaries of the project at the ground level. The project should adopt bottom-up decision making process rather than the top-down approach.	Note was taken, and project proposal addressed the highlighted issue.
Since Forest Department, VPs, SHGs etc. are guided by different institutional guidelines and mechanism; the project should work towards ensuring administrative harmony and build capacities of line departments to ensure smooth implementation and long term sustainability	Note was taken, and project proposals already have addressed the highlighted issue.
The market of NTFP/ Non NTFP products fluctuate, so information flow mechanism should be developed using modern technologies (mobile phone, SMS, etc.)	Note was taken, and project proposals already have addressed the highlighted issue.
Women mostly involved at the village level are found to be anemic. Forest do not have huge amount of fruit bearing plants/ trees. There is a need to promote it. To ensure food security, the project should encourage fruit trees and NTFP plantation on land of absentee landlord through SHG and women can benefit maximum out of it.	Note was taken.

Source: JICA Survey Team

Chapter 5 KEY ISSUES

5.1 Major Causes of Forest Resource Degradation and Present Threats to Forests

In Uttarakhand, the land under forest cover constitutes 45.80% (2,449,600 ha) of the total geographical area, out of which the crown density categorized as “Very Dense Forest (canopy cover more than 70%)” by the Forest Survey of India (FSI) is 556,700 ha, or 22% of the total forest area. The rest about 78% (1,920,000 ha) is the degraded forests, categorized as Moderately Dense, Open Forest or Scrub. Even though 300 ha net increase is observed in the forest cover of Uttarakhand from 2005 to 2011, according to the India Status of Forest Report (ISFR) 2009 and 2011, the quality (crown density) of existing forests is degrading.

The increase in forest cover is due mainly to the industrial plantations, mainly of fast-growing species like eucalyptus & poplar, in the plain areas of the districts of Nainital, Udham Singh (US) Nagar and Haridwar. On an average, about 23,000 ha area is planted yearly by the Forest Department, and about 9.6 million plants (equivalent to about 96,000 ha) planted under the Extension Plantations by other departments, organizations and Van Panchayats (VPs), according to the Uttarakhand Forest Statistics Report (UKFSR) 2011-12. Plantation activities on such a large scale would have increased forest cover substantially. However, the size of degraded forests (Scrub, Open Forest, Moderately Dense Forest) increased from 1,892,900 ha to 2,044,000 ha (about 150,000 ha) between 2005 and 2011 (ISFR 2005 and 2011). This data proves that the quality of existing forests is decreasing, while the forest cover is extending.

In Uttarakhand, more than 70% of the population live in rural area (Census Report, 2011), often in the vicinity of forests and depend on their sustenance on agriculture. The population in these areas has almost doubled from 5.7 million in 1981 to 10.1 million in 2011. The present cattle population of Uttarakhand is 4.94 million (Live Stock Census, 2003), and there is a deficit of about 9.23 million tons of green fodder per year in the state, which leads to overexploitation of the forests, according to an estimate (Singh & Singh, 2009). Grazing and trampling of saplings in the forests by livestock is a threat to the natural regeneration in the forested areas.

Similarly, there is a gap of about 1.90 million tons of fuel wood between the supply and demand (ISFR 2011) in the state, which is mainly removed as head loads from the forests by villagers. Timber is another major product used by the hill people in house construction. More than 80% of household use of timber is from forest for construction of houses, as about 4.78 million cubic meter of timber is required at one time for house construction (ISFR 2011). It is thus clear that the rural population in the state is heavily dependent on the forests, and low level of awareness of local people and low capacity of VPs and other community-based organizations are resulting irregular and excessive exploitation of natural resources. Forest fire is another cause for forest degradation as about 2,000 hectare forestland is damaged every year due to forest fire (UKFSR 2011-12).

Other critical causes of forest resource degradation includes overexploitation of NTFP including medicinal and aromatic plants from the forests, conversions of forestland for non-forestry purposes for various developmental works, mainly for road construction, hydropower projects, transmission lines and relocation of *Van Gujars* (a nomadic tribe who live in forest and graze their cattle in the forest). About 40,000 ha of forest land has been converted for non-forestry purposes in Uttarakhand since the enactment of the Forest Conservation Act 1980 (UKFSR 2005-06 & 2011-12). The proliferation of exotic, invasive species like *Lantana* and *Partharium* has turned vast area of forests degraded as well.

Geologically, Uttarakhand belongs to young folded mountains of the Himalayan System, which has evolved through a series of land formation processes and been active over a geological time. The current environment is the resultant of these processes. Ongoing tectonic process has made these ranges one of the most fragile ecosystems and vulnerable to adverse effects of climate (Wetland Atlas of Uttarakhand 2012). Increasing anthropogenic pressures and natural disturbance on such sensitive mountain ecosystems are resulting in the fast depletion of the natural resources. Natural calamity

results in landslides, slope failures, siltation of river bed sides and uprooting of trees in the forests in this fragile mountain terrain.

In the warm temperate and cool temperate zones dominated by the Chir-pine and Deodar-kail forests are devoid of new recruits due to discontinuation of silvi-cultural operations after the ban on green felling above 1,000 meter, resulting further degradation of the once well-stocked forests. It has also adversely affected the productivity of the forests.

Rise in temperature due to climate change appeared to have affected the phenological schedule of the species, causing problem of regeneration and survival. It has also accelerated vertical shifting of the species, including shifting of tree lines, threatening existence of higher altitude species.

5.2 Issues of Natural Resource Management Policies and Administration

As the state stands part of Indian Himalayan Region, its natural resources are of immense importance. The ecosystem services provided by the rich reserve of natural resources (forest, glaciers, water bodies, alpine meadows etc.) to the whole country have been estimated to be of INR 400 billion per annum. But the recent disaster has raised question marks on the efficacy of natural resource management and thrown several challenges before the state and the Union Government to articulate a climate-resilient development strategy for the whole region. Although there are number of issues regarding management and administration/governance of the natural resources, the important ones that need to be addressed include:

- a. The forests under the administrative control of the Forest Department have regular Working Plans for sustainable management of the natural resources, but forests outside the administrative control of the Forest Department have inadequate plan for management and utilization of natural resource. For instance, many divisions do not have Composite Management Plan for the VP areas, despite of the stipulation in the State VP Act 2005. Many VP forests do not have approved micro plans. As per the direction of Supreme Court of India and the Government of India through the National Working Plan Code 2004, the forestry activities within VP areas or Civil & Soyam (CS) forests may be restricted without a plan approved by the MoEF. This is a matter of important concern, which may affect the implementation of proposed JICA project.
- b. In Uttarakhand, so called “non-territorial forest divisions” as Soil Conservation Forest Divisions, CS Forest Divisions, Tehri Dam Divisions, have been created to address the issues of soil conservations and local needs for natural resources. Territorial and non-territorial divisions operate in the same areas (overlapping), as the Reserved Forests are controlled and managed solely by territorial divisions of UKFD, while the non-territorial divisions manages forest outside the Reserved Forests. However, some non-territorial divisions manage VPs, which extends to a part of Reserved Forests. As the non-territorial divisions have no mandate to manage the Reserved Forests, they do not have a Working Plan or Working Plan officers in the division and do not know the prescriptions in the plan. If the project will be implemented by non-territorial divisions and their VPs with some Reserved Forests, the coordination between territorial and non-territorial divisions will be vital, and a proper administrative arrangement must be in place officially.
- c. The Working Plan officers are not adequately equipped with modern equipment and technology based on GIS, MIS etc. There is also a lack of skill for using modern technology in the preparation of Working Plans. Considering the importance of Working Plans and the requirement of field exposure and skill for using modern technology for preparation of Working Plans, as is the practice in many other states, an officer of the rank of Conservator of Forests should have been posted as Working Plan Officer.
- d. The Working Plan includes an overlapping Working Circle, namely Conservation of Natural Water Sources, Water & Soil Conservation. This Working Circle under the prescription of Working Plan becomes increasingly important in view of disaster mitigation and securing water. However, the survey techniques, identification of erosion mechanism and countermeasures therein, silvicultural and other engineering operations under this Working Circle require greater

technological improvement as the experiences and technical expertise of UKFD in these aspects are limited only to the forest protection, vegetative measures and simple mechanical measures such as brush-wood check dams, rubble random dry and some simple gabion check dams.

- e. There is an urgent need to formulate policies which could reduce the pressure on the forests. The forests are over exploited for fuel, fodder and NTFPs despite restrictions on harvest. Activities to reduce the gap in the supply and demand of fodder and fuel wood seem to be limited. There is a great loss to the biodiversity because of over exploitation, encroachment, forest fires and other calamities. The policies need to be reviewed to address these issues.
- f. Ecologically sensitive and fragile higher altitude grass lands (Alpine meadows) locally known as “Bughyals” are under heavy grazing pressure by migratory grazers (other than local inhabitants). There is urgent need to assess the carrying capacity/grazing capacity of these alpine meadows and regulate the grazing. Policies may be needed to regulate the entry of migratory grazers into these areas.
- g. Uttarakhand is rich in NTFP including Medicinal Aromatic Plants (MAP), but due to lack of proper survey and assessment of these resources at micro level, strategy for conservation, harvesting and development could not be developed which has resulted in irregular and over exploitation of the natural resources and has led to some of the species heading towards extinction.
- h. The collection from the wild of 34 MAPs has been restricted in Uttarakhand. However, there is a need for the state to review its restricted list of MAPs and perhaps some species could be excluded from this list, sustainable harvesting protocols should be developed and efforts should be made to should also be directed to cultivate.
- i. Due to ban on felling of green trees above 1,000 m above sea level, natural regeneration and productivity of Chir pine and Deodar-Kail forests have been adversely affected. Recently studies have been carried out by the Forest Research Institute (FRI), Dehradun and Research Wing of UKFD to address these issues. The policy needs to be reviewed based on the findings of these studies.
- j. Because of the green development/forest conservation initiatives Uttarakhand is in a state of paradox. It suffers revenue losses, which are not compensated. The state has been quite vocal in its demand for compensation for its green development initiatives and the valuable ecosystem services it provides to rest of the country. It also demands for the green deficit states to pay for the ecosystem services provided by Uttarakhand. But resources to compensate such sacrifice to conserve the forests for the people downstream in exchange for development have been minimal. 64 percent of the geographical area is recorded forest so far, and any change in land use for basic infrastructure development the state has to pay heavily Net Present Value (NPV) of forest. Many times the change in land use is rejected by the MoEF.
- k. Although a high powered State Climate Change Council has been constituted and also a State Action Plan on Climate Change (SAPCC) has been formulated for Uttarakhand, but the state government has made no efforts for implementation of the SAPCC even after one year of formulation of SAPCC. The setting up of an Environment Directorate at the state level to co-ordinate all environment and climate change related initiatives is required.
- l. Settlement of rights of Scheduled Tribes and Forest Dwellers under Forest Rights Act, 2006 is still awaited even after six years of the enactment.

5.3 Issue of Van Panchayat, Incentive Generation and Other Forest Management Practices

5.3.1 Governance and Performance Issues and Challenges before Van Panchayats¹

(1) Autonomy and Authority of Van Panchayats

Table 5.3.1 An Overview of Van Panchayats

Traditional Van Panchayats (VPs) were exemplary institutions of community based forest management in Uttarakhand, unique in their constitution and interventions for forest management. During last four decades these institutions have undergone several structural and functional changes, with implications on the authority and autonomy of these institutions. Some of the changes were linked to ensuring proper technical management of forests; providing for greater checks and balances against misuse of powers given to VPs and were also linked to changing legal framework as well as paradigm of forest management in the country in general and hill states in particular.

As a result of recognizing these institutions and mainstreaming them in forestry development, the state formulated policies and rules, which has increased bureaucratic

- | | |
|----|--|
| 1. | VPs are the forests managed by Panchayats (Villages). |
| 2. | VPs are mostly located in Civil/ Soyam Forests (Revenue land) but also in the Reserved Forest areas. |
| 3. | Legal basis: Panchayati Forest Rules 1931, 1972, 1976, Uttaranchal Panchayati Forest Rules 2001 or VP Rules 2005. |
| 4. | VPs will have management committee of nine members and General Body comprised of the forest users or adult (18 years old or above) members of households having interest in managing and developing the VPs. |
| 5. | The management committee will have Sarpanch (chairperson) and secretary who is Forest Guard/ Forester/ Deputy Ranger. |
| 6. | VPs will plan for their own management plan (Micro Plan) for every 5 years and Annual Implementation Plan. |
| 7. | Revenue of VPs: Sale proceeds of forest produce, government grants, any other source of revenue. |

Source: Uttarakhand VP Rules (2005)

procedures and invited political interventions in some cases.

Also, the VPs have limited law enforcing powers under the existing institutional framework. To support the empowerment of VP, the State VP Rule prescribes the constitution of advisory committees at the area, district and state level and some of the members are to be nominated by the Revenue Department. It was found during the JICA Preparatory Survey that those committees are not functional in most areas in the State.

(2) Unit of Organizations of Van Panchayats

Although no district or state wise consolidated data on this exists, it is believed that the majority of VPs were constituted for the entire Gram Sabha or revenue villages within the Gram Sabha. The Survey Team found that some Van Panchayats (VPs) have representation from multiple villages belonging to same or different Gram Panchayats. In other cases, the VP is formed at the level of one revenue village. Although there was no official data/ document available, the Survey Team was informed that the VPs are formed mostly at the level of the Revenue Villages, while many of the VPs still retain their multi-village structure. Such a structure is based on traditional use rights and ensures efficient protection outcomes.

¹ Based on the review of existing literature and discussion with some of the VPs. Bhim Singh, Sarpanch VP Piura and Moni Bisht, Sarpanch, VP Newra, Nainital, Anil Dangwal, Sarpanch, VP Birpur, Uttarkashi, Arvind Bahuguna, Sarpanch, VP Lawadhar, Tehri, Vinod Dabral, Sarpanch, VP Churerghad, Tehri were consulted.

(3) Size of Panchayat Forests

Size of forest vis-à-vis the human and cattle population is an important element in the sustainable management of forests. 545,000 ha of total forestlands are classified as Panchayat Forest, averaging 45 ha per VP. 60% of the VPs have less than 15 ha of forest areas protected and managed by them, and 13% of total VPs are having even less than 3 ha of forest area under their management. This is the result of target driven approach to form VP.

The areas of VPs, in many cases, are not demarcated properly, which is a reason for conflict and litigations. Since the area is small the pressure of the communities for fuel, fodder and other forest produces has shifted to the adjacent Reserved Forest (RF) and other forests.

Since the areas are small and given the restrictions on the harvesting of timber and NTFPs from the forest, the VPs do not have the incentives to protect and manage the forest. The opportunity for livelihood enhancement using forest produce is limited in many cases.

5,300 VPs created after 2000 have an average of 25 ha of forestland only. A majority of the VPs, particularly those formed in the past decade, have been constituted in a very small area. Available statistics indicate that 1,172 VPs have less than 2 ha area, while 2,002 VPs have an area between 2 to 5 ha as shown in the table below:

Table 5.3.2 Distribution of VPs based on area

Area under VP (ha)	Number of VPs	Area under VP (ha)	Number of VPs
0 to 2	1,172	50-100	1,124
2 to 5	2,002	100-150	322
5 to 10	2,283	150-200	169
10-15	1,359	200-500	195
15-20	975	500-1,000	43
20-50	2,381	>1,000	19
		Total	12,044

Source: Tewari, P. and P. Phartiyal (undated), *Strengthening of Community Managed Institutes (VPs) through Public-Private Partnership in Uttarakhand, India*

Note: Area is not confirmed for 45 VPs

In the Compensatory Afforestation Fund Management and Planning Authority (CAMPA) program, the cutoff for selection of VP is 50 ha. (except for Uttarkashi where the cutoff is 25 ha.). New and smaller VPs are institutionally weak and face various issues of lack of funds, sustainable management etc. and are in greater need of support to develop themselves as strong institutions.

(4) Notification of Van Panchayats

When a RF is allocated to the Van Panchayats (VPs), it is not de-notified / de-reserved. The legal status remains as Reserve Forest but the management category status changes to Panchayat (Village) Forest. Though the VP Rule provides the scope for allocation of RF to VPs for management, the size of RF allocated to VP is less. Earlier, the Collector and DFO were empowered to decide on the allocation of RF to VP, but after the VP Rules 2005, the final decision on the matter is to be made by the State Government.

While the VPs are not officially notified, or the RF is not de-notified, the VPs have no formal authority or responsibility to manage the forests. The VPs are informally managing the VP areas at the community level in such cases.

Legally, there are no difference in management implication for a forest created out of Reserved Forest (RF) and Civil and Soyam (CS) forest. The same legal and management framework is applicable in both the cases. This difference existed prior to 2005, when there were separate legal arrangements in the form of Uttaranchal Village Forest Joint Management Rules 2001 (for RF) and Uttaranchal Panchayati Forest Rules, 2001 (for Van Panchayats). While the JFM arrangements were mostly related to Reserve Forests, the JFM arrangements were applied to nearby VP also in some cases.

5.3.2 Community Participation & Van Panchayats Involvement in Government Funded Projects

(1) Low Revenue of Van Panchayats

. In this environment, the Van Panchayat (VP) finds it increasingly difficult to mobilize the community to contribute either labor or cash for forest protection. The situation is more acute in those VPs which do not have any independent source of revenue. Most of the VPs have either no source of income or low income. During field study by the Survey Team, more than 80% of the VPs indicated either no income or annual income of Rs. 1,500 to 3,000 from fees and permits. This does not include the funding under government schemes (NAP / CAMPA). Low value products such as fuel and fodder, is the main factor for the low income of VP. The instances of damage to agricultural crops by wildlife, especially by wild boar and monkeys, have been increasing during last fifteen years, and the forests are seen as the habitats of those wild animals which should not be protected. Some VP members expressed that that forests should remain degraded so that the wild animals will not increase.

The VPs feel that their need for funds has increased as the institutions of community contribution for protection has weakened, and the potential for income from forest has been reduced due to increasing restriction on harvest and sale of forest products especially small timber and MAPs. Many Sarpanches (Chairpersons of VP management committees) reported the expenditure from their own pockets. The VP members also act as unpaid watchers.

(2) Fund Management and Record Keeping

At present, most VPs do not have capability to manage their fund and keep proper books of accounts. The Member Secretary of VP (Forester or Forest Guard of UKFD) and the Sarpanch (Chairperson of the VP) jointly operate the bank account of the VP and the financial records are being maintained by the Secretary. In many cases, it was found that the elite leadership has taken control of maintaining records of VP. Other VP members are not aware of the activities of VPs.

(3) Elections

In many VPs, elections are not taking place even after the completion of the term of five years and this has severely hampered the democratic decision making process in the VPs. Moreover, 50% reservations for women have been made for the post of Sarpanch of the VPs but in most cases it has been found that women have not been able to take benefit of these reservations since timely elections have not taken place.

(4) Encroachments

In several cases, encroachments on VP land by the villagers were observed. Management Committee and/or the Sarpanch of a VP does not have sufficient power to take action against encroachers.

(5) Forest Degradation Outside Van Panchayat

In some cases, the fruit and Chir pine trees on CS Forests have been informally privatized. Formally, the CS forests are under the management control of the Gram Sabha. The contractors have to pay fees to the 'owner' before they can tap resin, and in other cases it is treated as Common Property Resources. In most cases, the CS area is treated as 'open access' and thus largely degraded.

5.3.3 Composite Management Plan & Micro Plan

(1) Issues related to Composite Management Plan

The VP Rules 2005 prescribe for preparation of Composite Management Plan (CMP) by the Divisional Forest Officer (DFO) for the Panchayati forests, based on which each VP shall prepare its micro plan. The CMP is supposed to provide the broad guiding principles for preparation of micro plans. Currently, these composite management plans are not available for any the divisions, except Bageshwar Territorial Forest Division. It was verbally communicated to Survey Team that a CMP was

developed for Almora Division in 2002-03 and that Lansdowne Forest Division is also in the process of preparing the CMP.

In 2013, the Forest Department decided to outsource the preparation of CMP to technically qualified agencies and invited Expression of Interests (EoIs). The EoIs have been technically appraised and final decision on the matter is pending.

There have been no official guidelines for the preparation of CMP.

(2) Issues related to Micro planning

The VP Rules 2005 mandate all VPs to prepare a five year micro plan with technical support of the UKFD officials. Out of 12,089 VPs, only 4,767 VPs (39%) have a micro plan. Preparation of micro plan for 12,089 VPs requires adequate time of skilled staff of the Forest Department. It seems that preparation of micro plan for the Panchayati forest is not a priority for the staff of UKFD in the field. There is inadequacy of funds to prepare and implement micro plans. In some cases it was reported that the VPs have to contribute 20% of the total cost for implementation of micro plans.

The main observations of the Survey Team regarding the current micro plans and the micro planning are as follows:

- The Forest Department had prepared a template for preparation of micro plans after VP Rule 2001. The template is revised to suit the needs of various schemes, such as NAP and CAMPA, which require preparation of such plans.
- It is found that micro plans were also developed under the World Bank supported JFM Project, NAP and under other context between year 2000 and 2010 in different VPs. However, no consolidated information exists for older micro plans.
- The micro plan preparation is mostly outsourced to local NGOs by the concerned Forest Divisions. However, the stake of the NGO is only limited to facilitate the micro planning process and documentation of the micro plan.
- The extent of involvement of the local community in the preparation and finalization of micro plan varies. Most of the micro plans reviewed by the survey team indicate that only a few members of the VP are involved in collecting and analyzing the data.
- There is an existing practice of approval of various activities to be undertaken by the General Body, for which a formal written resolution is made. There is a need to ensure better methods for presentation of micro planning outputs before the community and greater participation (both nature and extent) of the community in finalizing the plan.
- There is little linkage between the data that is collected and the activities that are proposed. For example, the dependence on forest is analyzed only in terms of fuel and fodder, and there is little focus on the other NTFPs or small timber / timber requirement of the community.
- The micro plan does not include any analysis of the status of forest vegetation and the various type of interventions and treatments required. The focus is limited to the area identified for treatment for which also there is no treatment plan or map.
- The unit of analysis is mostly the whole community, and no socio-economic category segregated analysis was adopted, especially for the socially disadvantaged sections of society, for their problems, opportunities, needs or priorities.

5.3.4 Strategies for Strengthening Van Panchayats

The Forest Department and Revenue Department should act as facilitators to strengthen the VPs, not at scrutinizers or controllers of VPs. The Government should look at the VPs as stakeholders of forest management not as beneficiaries of forest resources/ projects. Some suggestions have been made below to strengthen the VPs and ensure sustainable management of Panchayati forests.

- a. Delineate forest boundaries and VP boundaries and usufruct rights in order to avoid future potential conflicts.
- b. Take up adequate initiatives for orientation and training of VP members to strengthen the function as vibrant forest managing organizations and to help evolve their internal control systems and procedures so that they function democratically for conservation and management of forest resources.
- c. Help strengthen the capacity of VPs to work for enhancement of livelihood opportunities for the members, which in turn would achieve sustainable forest management. Provide adequate funds and linkages for resource development as well as enterprise development.
- d. Build the capacity of women in VPs to efficiently manage the funds, programmes, records and forest produces management.
- e. Create mechanism for priority access of VPs to different programmes and schemes, which would definitely act as an incentive for the VPs to perform better.
- f. Facilitate federation building of VPs/ consultation committees at area, range/block, district and state level, which would work for a) strengthening the capacity of VPs, b) evolve mechanism for conflict management and grievance redressal, c) ensure proper functioning of VPs through mutual monitoring and building peer pressure (participatory guarantee mechanism), d) facilitating effective and efficient partnership with Forest Department, Revenue Department, Panchayati Raj Institutions (PRIs) etc., and e) suggest the Government for necessary changes in policies, rules and practices.
- g. Rather than the VPs to become institutions for implementation of programmes/ schemes, it should self-initiate/ evolve for forest conservation and management.

5.3.5 Issues of Joint Forest Management and Village Forest Committee

A total of 729 VPs and 488 Village Forest Committees (VFCs) were involved under Joint Forest Management (JFM) Project funded by the World Bank during the 1990s and 2000s, covering an area of 2,061.66 km² of forest land and 587.86 km² of civil soyam and revenue land.

One of the major bottlenecks in the implementation of JFM in Uttarakhand, especially under the financial support of the World Bank during 1990s, was that the people of Uttarakhand already had a long tradition of community forestry through the mechanism of VPs. Consequently, the concept of 'joint management' of forests had limited appeal for the communities. Delay in formation of VFCs has resulted in delay in disbursement of the fund and thus, in most cases, VFCs could get funds only for 2 to 3 years out of the project duration of 5 years. Forestry project are generally of a long-gestation period but the closure of this project after 5 years and lack of handholding by the FD subsequent to the project meant that the VFCs were not able to sustain after the project duration ended.

A sample study in 9 forest divisions by Chief Auditor General (CAG) revealed that the VFCs were unable to generate any cash incomes from JFM works. However, benefits in the form of increase in production of grasses, fodder and biomass were reported.

The forests allotted to be VFCs were supposed to be converted into VP after the abolishment of JFM in the state after the separation from the State of Uttar Pradesh, but many of VFCs' forests are yet to be officially notified as VP.

5.4 Issues of Current Practices of Project Operations and Monitoring & Evaluation

5.4.1 National Afforestation Program and Compensatory Afforestation Fund Management and Planning Authority

National Afforestation Program (NAP) and Compensatory Afforestation Fund Management and Planning Authority (CAMPA) programs are being implemented through the established Forest Department structure, and thus have common issues for project implementation and Monitoring & Evaluation (M&E). These issues are also applicable to the forest department in general. Some of the key issues are:

- a. Shortage of staff: requisite staff strength is not adequately and uniformly available at field level
- b. Age of staff: Field staff is not able to provide desired field support due to ageing factor; such staff are not able to frequently undertake field visits
- c. Field visits and monitoring Survival percentage: Administrative orders are in place for undertaking field visits at each level, and norms for adjudging quality of plantations and its survival percentage are well published. These prescribed procedures are not very rigorously followed.
- d. Inspection notes: These notes are not being written for all field visits undertaken, and shared after the field visits; there are few occasions when remarks are recorded in Plantation Journals and Daily Tour Diaries soon after the field visits.
- e. Flexibility for decision making: Since forest department has very strict disciplined cadre and follow hierarchy, very little scope is with the lowest level staff to make quick decisions to respond to the local situations and conditions.

5.4.2 Watershed Management Directorate

The Watershed Management Directorate (WMD) is implementing the projects with external and/or other funds, and is continuing getting funds from various government schemes as well. Recent shuffle in the posting of the officials on deputations shows some discontinuity in knowledge management that was gained over time by way of trainings and implementing various projects/ schemes. But this gap could be covered in short span as systems are already in place.

The key learning that emerged during the closure of the World Bank supported Decentralized Watershed Management Project are:

- a. Shortage of adequate and appropriate data to support the achievements and statements. WMD had relied more of the External Evaluation agency, and in-house documentation of quantified data was neglected. The WMD focused on participatory M&E that was more qualitative in nature, and could not substantiate quantified data.
- b. Sampling sites were not representative of project interventions and thus could not reflect upon the project impacts in a holistic manner.
- c. There was no system of capturing annual data as the evaluation design focused only on baseline, mid-term and end-term data comparison. This approach resulted in overlooking cyclic / annual fluctuations due to climate / other factors, and period comparison could not reflect upon the realistic situations/ variations.
- d. The WMD through the MIS captured large data considering various needs of the project as well as government which was never analyzed. Thus, more appropriate strategy would have been to identify important parameters and areas for capturing data and undertake analysis to help efficient management of project.

- e. No sound data was available to support strategic decision making during the course of implementation;
- f. The institutional design lack system of undertaking technical audits of the interventions for watershed improvement.

Another challenge is continuing with the post project monitoring of the activities from where the project has existed and now there is no presence of the staff. To ensure sustainability of the efforts post-project monitoring arrangements need to be framed by the WMD.

5.5 Major Issues on Conservation of Wildlife, Biodiversity and Ecotourism

5.5.1 Wetlands

- a. In view of climate change and melting of glaciers, the environmental functions and contributions of wetlands to disaster management started to draw attentions just recently.
- b. Some studies on wetlands in the state have been undertaken but lack essential information on the function of wetlands in terms of biodiversity conservation, disaster mitigation, and provision of other environmental services.
- c. Despite numerous benefits, wetlands are the first target of human interference and are among the most threatened of all natural resources. Around 50% of the earth's wetland area is estimated to already have disappeared over the last hundred years through conversion for industrial, agricultural and residential developments. Even in current scenario, when the ecosystem services provided by wetlands are better understood - degradation and conversion of wetlands continues. This is largely due to the fact that the 'full value' of ecosystem functions is often ignored in policy-making, plans and corporate evaluations of developmental Projects.
- d. As to which agencies and departments have the authorities and responsibilities to conserve and manage wetlands are unclear.
- e. There is no clear and explicit strategy for the conservation of important wetlands in the state.

5.5.2 Sacred Groves

- a. The importance of sacred groves in conserving biodiversity and providing vital biological resources to local and global communities has increased as the biodiversity in the state is declining. Some studies on sacred groves in the state have been undertaken but lack essential information on the availability of biodiversity in such forests.
- b. There is no clear and explicit strategy for the conservation of sacred groves in the state.

5.5.3 Biodiversity Management Committees & People Biodiversity Registers

- a. State Biodiversity Rules is yet to be notified.
- b. The number of Biodiversity Management Committees (BMCs) and People Biodiversity Registers (PBRs) are very small, and the capacities of BMCs are very low as there is no major support provided by the state to BMCs.
- c. Coordination between the state and village-level institutions has been poor, and the coordination among the BMC, VP, Gram Sabha and other community based organization requires greater improvements.
- d. Prioritization criteria of Gram Sabhas or Development Blocks for preparation of PBRs is unavailable.

5.6 Analysis on the Capacity of Executing Agency, Other Stakeholders and Local NGOs and their Coordination

5.6.1 Executing Agency

Required ratio of staffing is not maintained at each level of operation, and front-line staff is ageing. The department institutional structure is not able to fully utilize the experience and potential of officials/ staff trained and oriented within country and abroad. System relies on age-old punishment approach that rather demotivates staff to work. Coordination amongst various wings within the departmental functioning is limited, and more synergy is required particularly translating research findings into action during field execution.

- a. **Updated knowledge on recent Acts and Guidelines:** Field staff is not exposed to new initiatives/ developments and approaches currently being followed in the forestry sector. Most staff has no sound knowledge and updated on existing rules and regulations. Field staff is not well acquainted with the current provisions of applicable Acts and operational guidelines to work with VPs and related institutions like Gram Panchayat, Revenue Department, Panchayati Raj department, NGOs, Territorial and Wildlife staff etc.
- b. **Work experience with multi-stakeholders:** Field staff and the VPs members are not much experienced working with multi-stakeholders particularly, NGOs, SHGs, Financial Institutions, external experts etc. The UKFD staff is not able to acknowledge VPs as partners to jointly manage the village/ reserved forest, and mainly like to engage them for plantation and related works as wage-earners.
- c. **Exposure to gadgets and its use:** Staff is oriented to work with age-old systems only and not equipped with latest gadgets and lack computer skills. Field staff are not exposed to many of the new gadgets like GPS, digitization, Computers etc.
- d. **Documentation and Report:** There is general lack in capacity, particularly at lowest level, for documentation of field processes, short-comings and achievements; Reporting is limited to preparing achievements with respect to physical and financial targets only, and such reports are not being prepared as a regular exercise.
- e. **Management Committee of VPs:** Limited capacity with the members in the management committee for planning, implementing, monitoring, reporting, account keeping and auditing; low literacy level / education would also pose a challenge.
- f. **Environmental and Social safeguards:** Limited knowledge and awareness about environmental and social safeguards at VP level and field staff.
- g. **Technical staff and equipment at project Divisions:** Though the Composite Management Plan and Micro-plan are key processes to initiate works but still the plans have not been formulated and adopted universally across the state. There is a lack of adequate/ qualified staff and equipment/ gadgets to prepare Composite Management Plan and technical drawing/ maps etc. at the VP level.
- h. **Orientation on Project Management and Monitoring & Evaluation techniques:** Forest staff are oriented and trained to respond to the routine requirements of the department, but not trained/ oriented on project management cycle, requirements of a project, M&E procedure, documentation and reporting. Guidelines are not judiciously adhered for reporting / sharing feedback by various offices divisional, Zonal/ Circles etc. and its utilizations for introducing corrective measures during implementation.

5.6.2 Panchayat Raj Institutions

The Panchayat Raj Institutions (PRIs) are elected by people and established at District, Taluk and Village envisaging to solicit enhanced participation of people and effective implementation of the rural development programs. Since many government interventions to improve the livelihood of the rural communities like this project activities will be implemented through PRIs, the project will be required to establish a partnership with them in order to increase the efficiency and effectiveness of the livelihood interventions under this project through convergence.

In order for the project to work effectively with the PRIs, it is important to orientate them with the sufficient information on the project modalities and their anticipated roles. For this, the project will be required to carry out the orientation programmes for PRIs at the early stage of the project. Further, the project will need to ensure the effective functioning of the District Advisory Committee (DAC) which provides a platform for the project to negotiate with PRIs.

5.6.3 Local NGOs

From the results of the survey, it became clear that the capacity of NGOs varies from one another. Some may have ample experiences working with donor funded projects and can take systematic approaches to management but others may not. The local NGOs which will be engaged in this project will be required to implement the activities as per the project specific modalities and submit report as prescribed by the project. Thus, they need to be given proper guidance in project specific modalities and reporting system at the early stage of their engagement.

5.7 Issues in NTFP policies, enterprise and marketing

Although Uttarakhand has been declared as a herbal state and has unique position in the medicinal plants' market because of the availability of precious Himalayan herbs, most of the high value-NTFPs are restricted for harvesting and sale from the forest/ wild. Harvesting of 34 species from forest land including private land is banned. Regulated harvesting is also applied for other species by UKFD by way of allocating the areas to be harvested on an annual basis or quantum of harvest to groups/ organisations. Lichens, mosses and pine resin are the important NTFPs being procured and traded in the state. Harvesting of Lichens and mosses is regulated by the UKFD. The area to be harvested is allotted by the UKFD every year on a rotation basis. Harvesting of pine resin is exclusively done by the UKFD. Although the harvesting of the NTFPs from the forest land are regulated in one way or the other, many important herbs/ medicinal plants can be cultivated and harvested on the private land and traded. For the trading of such NTFPs, registration of the agency and transit permit from the UKFD are required and the produces need to be traded at the NTFP markets in the state.

5.7.1 Lack of adequate information on production and potential of NTFPs

Inventory of NTFPs as well as information related to current production and future potentiality of NTFPs is not readily available with UKFD or with Uttarakhand Forest Development Corporation (UFDC). UFDC only maintains records of NTFP sale based on the produce that comes to the *Mandis* (markets). Data pertaining to the utilization of the NTFPs, within the state as well as outside the state, is not readily available either with UKFD or with UFDC.

5.7.2 Conservation, resource augmentation and management of the resource

The working plans clearly prescribe that forest ranges shall be opened on a rotational basis for harvesting of NTFPs and during 2003 the Government executed the system of conservation, development and sustainable harvesting of NTFP. Apparently these guidelines are not been implemented in letter and spirit. This is evident from the available figures relating to annual harvest of lichens and mosses, which seem to indicate that lichens and mosses are also being harvested from outside the permitted ranges. Lack of resource inventory of different NTFPs, absence of yield

regulation and lack of facilitation of harvest and collection seems to be leading to overexploitation of NTFPs.

5.7.3 Institutions

Although five institutions (namely Uttarakhand Forest Development Cooperation/ UFDC, Bhesaj Sangh, Kumaon Mandal Vikas Nigam/ KMVN, Garhwal Mandal Vikas Nigam/ GMVN and VPs) are being involved in collection and marketing of NTFPs but they don't really have any significant work on sustainable harvesting and processing of NTFPs. None of them have been promoting enterprise development on NTFPs. In the context of sustainable harvesting, procurement and market development there has been inadequate effort by the State Government to co-ordinate the activities of these institutions.

Bhesaj Sanghs at the district level have been promoting cultivation of medicinal plants on the farmers' land. The role of KMVN and GMVN has been very limited in collection and marketing of NTFPs and it seems their capacity to ensure sustainable harvesting and marketing of NTFPs is limited.

VPs seem to lack sufficient capacities to promote sustainable harvesting and marketing of NTFPs. Moreover, majority of VPs have a small area to protect and manage and apart from harvesting of lichens and mosses in selected forest divisions their role in collection, value addition and marketing of NTFPs is yet to be properly understood.

5.7.4 Marketing

Establishment of *Mandis*/ market place for auction has been a unique initiative by the State Government. The Government also introduced the system of floating *mandis*/ auction centres in the rural areas/ hills for the sale of some NTFPs. These floating *mandis*, apparently, are not in operation now. All the important NTFPs such as Lichens, Mosses and Tejpatta are coming to three NTFP *mandis* (Bibiwala, Ramnagar and Tanakpur). The volume of Tejpatta that comes to the NTFP *mandis* is very low in comparison to its total production in the state. Uttarakhand Forest Development Corporation (UFDC), which manages the *Mandis*, does not have any other functions to promote market for NTFPs.

There is a system of fixation of floor price of NTFPs by the Government. Apparently these prices are not updated regularly. In case of Lichens it was found that the floor price is much lower than the actual market prices (at the *mandis*). The role of UFDC in determining the floor price and the basis of deciding the floor price seems to be unclear. High price variations of same NTFP within the respective *mandis* as well as between the three *mandis* have been observed. During the discussions with different stakeholders it was understood that the traders operating in these *mandis* usually form a syndicate to keep the auction prices low and they apparently create situations unfavorable for the buyers coming from far off places to participate in the auction (particularly in case of lichens).

The emphasis of the Government is on pine resin, riverbed minerals, lichens and mosses which are harvested in large quantities fetching high revenues. It seems that there is little attention on the harvest and sale of other NTFPs which are being brought to the *mandis* in small quantities while raising apprehensions that large quantities are being marketed through informal channels.

There seems to be an absence of any form of market information system for the NTFP collectors and farmers. Apparently the efforts of UKFD or UFDC are limited in organizing the primary collectors and to promote a pro-poor value chain hence the intermediaries have eventually established control over the value chain. The NTFP collectors at the village and VP level seem to lack awareness about the NTFP value chain.

There is no incentive for primary collectors to focus on conservation and on primary level value addition.

Although in case of lichens and mosses clearly spelt out policies are available to reduce the exploitation of primary collectors, recent studies point out that contractor system still exists. There is also a system to engage laborers (mostly Nepali) for NTFP collection by the traders.

In Tanakpur, there are traders who import NTFPs from Nepal, especially the NTFPs, which can't be harvested from the forests of Uttarakhand. Some other NTFPs are also being imported which are of better quality and at competitive prices than those available in Uttarakhand. In order to ensure good markets for NTFPs from Uttarakhand there is a need to look at quality as well as the cost issues.

NTFP collectors (particularly lichen collectors) often need to borrow money for which they depend upon contractors and traders. This practice, keeps the collectors tied to local contractors who pay low prices to them. The NTFP contractors in turn depend upon the traders to finance them for acquiring the necessary working capital.

5.7.5 Enterprise

The resin policy² prescribes that 75% of the produced resin shall be utilized within the state (50% by open auction to units registered in Uttarakhand and 25% by open auction amongst units of Khadi-Gramodyog, Co-operatives, Kumaon Mandal Vikas Nigam and Garhwal Mandal Vikas Nigam) and this opens up doors for enterprise development within the state. However, there are no such guidelines for lichens and mosses and hence enterprise development in the state is not being promoted despite some promising prospects.

5.8 Bottlenecks in Livelihoods Improvement and Community Development - Key Lessons Learned from Relevant Projects and Programs

5.8.1 Bottlenecks associated with Entry Point Activity and Convergence

(1) Entry Point Activity

Entry Point Activities (EPAs) are the activities that should be implemented at the early stage of project implementation and also benefit the community as a whole. In the previous projects, the tendency was observed that the activities that only benefit a few individuals in the community were selected. It was also observed that the EPA that can potentially benefit the community as a whole but the implementation was not done properly and resulted in only a few individuals to benefit from EPA. For instance, solar street light was supposed to be installed along the path that the villagers would pass by but installed at a place where only a few can benefit.

The EPA selection and implementation process needs to be participatory to ensure that the community will benefit from the activity and the needs of the community as a whole will be reflected in the chosen EPA. The project will need to ensure the participatory process by providing appropriate facilitation through FNGO Field Coordinators and to guide the community not to select and implement EPAs that would only benefit the selected few community members.

(2) Convergence

In this project, many livelihood activities, especially those concerning Basic Human Needs are envisaged to be implemented through convergence with other programmes/ schemes implemented by line departments. To facilitate the process of convergence, the project proposed a District Advisory Committee (DAC) where the representatives of different District Level Departments will be present and make a decision to coordinate with the project in implementation of various activities.

In the case of JICA assisted Uttar Pradesh Participatory Forestry Management and Poverty Alleviation Project (UPPFMPAP), the DAC was rarely conducted in the project areas. Retrospectively, there was

² Formulated and issued on 30th April 2003.

a lack of policy decision at the highest level of project implementation unit, Empowered Committee, to facilitate and ensure the compliance of the District level offices to such instruction. Further, the guideline by the project on the convergence was lacking clear definition relating to the roles and responsibilities of each level of project management unit and other stakeholders.

On the other hand, JICA funded Orissa Forestry Sector Development Project succeeded in convergence. Two contributing factors are identified. One was the instruction issued by the Chief Secretary, who is also the head of the highest implementation unit of the project, to the district level authorities. This had made easy for the project to approach line departments. Furthermore, their animators and field level NGOs played an active role in linking the community with other programmes/ schemes.

From the above, a lesson can be learned that the success of the convergence could not be attained only by the community level effort but requires a policy support to facilitate the process. The similar strategy should also be adopted by the project to create an enabling environment for convergence.

5.8.2 Bottlenecks in Promoting Income Generation Activities

The project will give opportunities for SHGs to take up the income generating activities of their preference. The selection of Income Generation Activities (IGAs) will also be guided by the FNGOs engaged by the project so that they could select the economically viable IGAs. The issues with IGAs implemented by SHGs include; 1) lack of sufficient technical guidance in terms of planning, production, and management of the enterprise etc. ; 2) failure to select the economically viable activities derives of insufficient or none understanding of market condition; and 3) lack of strategic cluster development and coordination amongst the SHGs for better access to market and supporting services.

5.8.3 Women's Drudgery and Limited Opportunities for Livelihood

Community participation appears to have been a common approach in project implementation. However, the operationalization differs from project to project depending on the project objectives and thus the target population in the project area. In the case of Uttarakhand Diversified Watershed Development Project (UDWDP), vulnerable segment of the project communities were given more emphasis in investing the project resources. The wealth ranking was carried out in a community to identify the target population from the community point of view. This exercise has helped the project to gain understanding the vulnerable groups within the community and plan effective interventions.

Further, in many of the projects implemented, women's drudgery reduction was commonly done in the project intervention. It was reported that women spend about 12-14 hours per day doing their house work, fetching fuel wood and fodder, drinking water and agriculture works³. Further to add, de-facto woman household heads, who are left in the villages due to the outmigration of men, will need to fend for their families. Yet they have little time to spare for earning income or access to fund (only 46.8% of women have access and control over money⁴). Although the project recognizes that the women are the key actors in eco-restoration and livelihood development in the rural communities of Uttarakhand, they are overburdened with the domestic chores and farming or any other livelihood activities. Thus, to create and ensure opportunities for them to participate in meetings and project activities, it is necessary to incorporate drudgery reduction activities as part of the project intervention.

³Uttarakhand Women & Child Development Society <http://wecd.uk.gov.in/pages/display/127-guideline->

⁴ Ibid.

5.9 Japanese Technologies and International Marketing Opportunities

5.9.1 KANPO-YAKU - Japanese Herbal Medicine – Market

In Japan, traditional herbal medicine, KANPO-YAKU, is now prescribed in hospitals along with western medicines. In 2007, the market value of KANPO-YAKU was worth 113.1 billion JPY though it was only 1.8 % of the total market of pharmaceutical products. Out of the KANPO-YAKU market, the prescribed medications in hospitals account for 91.8 billion JPY, while 21.3 billion JPY is for the general use. The domestic market for the traditional herbal medicine has been forecasted to expand up to the value of 200 billion JPY in 2015⁵.

In Japan, 80 – 90% of the raw materials of KANPO-YAKU have been procured from China; however, the deterioration in quality and export control measures placed by the Chinese government has affected the KANPO-YAKU manufacturers in Japan⁶. They are bound to develop the alternative procurement channel either by domestic production or otherwise. The Japanese Ministry of Health, Labor and Welfare promotes domestic production of the medicinal plants through the infrastructure and biotechnology development in order to increase the domestic supply of the medicinal plants up to 50% by 2025⁷. The Ministry launched an initiative jointly with the Ministry of Agriculture, Forestry and Fisheries to promote the cultivation of medicinal plants among the Japanese farmers. Some of the herbal pharmaceutical companies have already started to diversify their suppliers. For instance, TSUMURA, a leading Japanese pharmaceutical company, has established a local subsidiary in Lao Republic where the production and processing of the medicinal plants are done.

Some medicinal plants have gained particular importance in Japanese KANPO-YAKU market lately. Liquorice and Ashwaganda are two of such plants. The overview of the trend in the Japanese market and potential is given below.

(1) Liquorice

Liquorice (*Glycyrrhiza uralensis* or *G. glabra*) is one of the medicinal plants procured from China though facing increasing difficulties in meeting the demand in Japan. Thus, not only the pharmaceutical company but also other companies started developing the production technologies. For instance, MITSUBISHI Plastics and Green Innovation Company in Tokyo have jointly started a research on the production method of liquorice⁸. SHIN- NIHON SEIYAKU has been exploring the possibilities in production of liquorice in India (JICA Survey Team, 2013). The company has expertise not only on liquorice but also on other medicinal plants and their production, there is a potential of calling in their help in production technology and value addition as well as marketing.

(2) Ashwaganda

Ashwaganda (*Withania somnifera*) is another prominent medicinal plant in India for its anti aging and anti cancer property, which is researched in a Japanese research institute, Industrial Technology Research Institute. The plant is said to grow in the dry zone of India and Nepal and could be used for health supplements. As in the project area, it also grows. The technical cooperation in production and primary processing may potentially be sought.

⁵ Morita, Tetsuaki. (2010). Edge Industry Analytical Report – KANPO-YAKU. Presentation dated on 22nd of February 2010. Published on the web. http://www.nri.co.jp/publicity/mediaforum/2010/pdf/forum125_2.pdf (Accessed on 6th September 2013).

⁶ Ibid.

⁷ An Article Published on “Yakuji Nippo, News Paper on Pharmaceutical Laws”. (2010) Published on 1st March 2010. <http://www.yakuji.co.jp/entry18291.html> (Accessed on 6th September 2013).

⁸ Yano, Toshihiko. (2010). “Securing the Raw Materials for KANPO – YAKU.” Published on Nippon Keizai Shinbun, News Paper on 29th October 2010. (http://www.nikkei.com/article/DGXNASDD2706S_X21C10A0000000/ . Accessed on 6th September 2013).

5.9.2 Aromatic Plants Products – Market

The market of the aromatic plants and their products is to the scale of 265.4 billion JPY (retail sales basis) in 2011 (AEAJ, 2013)⁹. The largest share in the market is cosmetics (99 billion JPY), of which 20% accounts for organic products. The second the largest share is the fabric softener/ room fragrances (75.3 billion JPY). As an increasing number of consumers want to enjoy different types of fragrance or aroma at various occasions, the demand for diversification of the products is likely to increase and the market would become competitive resulting from that the new products will be introduced to the consumers within a short span of time.

(1) Community Trade – SEIKATSU NO KI (Tree of Life)

A Tokyo based, SEIKATSU NO KI (Tree of Life), supports the community trade of the herbal products. Currently, they work with communities in five countries of France, Tunisia, Bulgaria, Ghana, and Egypt in extraction of essential oil, production of shea butter, chamomile, and hibiscus which are high quality and unique to the locality. The company supports in product development as well as marketing. In Sri Lanka, SEIKATSU NO KI has established an ayurvedic wellness hotel where the locally produced ayurvedic products are used. The potential for organic roses, soap nut and tulsi may attract their interest.

5.9.3 Opportunities

As above, the opportunities for partnership in product development and marketing by the Japanese firms and in Japan seemed to exist. Although the cultivation within Japan is being promoted, India still holds an advantage in providing plenty of varieties of the medicinal plants that can be cultivated either organically or with low farm inputs. And the labor cost of production would be lower than that of Japan. Thus, the opportunities exist. On the other hand, the challenge would be the quality control and laws and regulations that could restrict export of such products.

During the project implementation, further analysis on the potential of the MAP production is suggested to be carried out as well as the laws associated with export of raw materials and semi-processed products. The Japan External Trade Organization (JETRO), which has an office in Delhi and provides assistance in identifying and initiating a dialogue with potential partner organizations, may be approached. Indeed, the project itself may also seek information of the potential partners and approach them directly through other mode of communication.

5.10 Issues on Safeguard Policies and Practices

5.10.1 Institutional Framework for Implementing and Monitoring Environmental Safeguards

The Indian legal framework shall be adequate for avoiding serious adverse environmental impacts, however there may be some small-scale, temporary and reversible environmental impacts associated with project activities and there are some slight concerns over the institutional capacity to properly assess and mitigate these impacts. Issues may arise where villages prioritise certain small-scale infrastructure projects e.g. drainage line treatments, access road upgrade, bridle path construction, micro-hydropower or other small dams etc. where the UKFD has limited technical capacity to properly assess the risks, propose appropriate technical designs, supervise construction and conduct technical site monitoring assessments etc. There are therefore inherent institutional issues which can

⁹ Aroma Environment Association of Japan (AEAJ). (2013). News Release on Survey Report on Aromatherapy related market in Japan. 30th January 2013. AEAJ; Tokyo Japan.
(http://www.aromakankyo.or.jp/article/koho/1749/80_1749_1_0_130204041737.pdf accessed on 11th September 2013).

affect project design. The project can resolve these issues through a) Building the capacity of the UKFD for environmental assessment; b) eliminating certain community development projects for which the UKFD has limited capacity to supervise on; c) creating an appropriate project institutional structure which creates a framework for inter-agency collaboration in implementation; or d) bringing in additional expertise for the project itself i.e. secondment of rural engineers etc from other departments or hiring of consultant engineers.

5.10.2 Institutional Capacity for Implementing and Monitoring Social Safeguards

Arguably the most critical safeguards issue related to the project is the implementation and monitoring of social considerations. The project intends to promote participatory forest management through the strengthening of community-based forest management institutions (VPs). However, in the past Joint Forest Management (JFM) initiatives in India have been criticized for diluting the traditional rights of communities over the forests (Poffenberger & Singh, 1996¹⁰; Nayak, 2002¹¹). Moreover, even in Uttarakhand, the World Bank Village JFM Project (1998-2002) was criticized on the ground that it intruded the traditional forest management system i.e. VPs (Sarin, 2001)¹².

UFRMP needs to learn from the past to ensure that such mistakes are not made again, and there is some danger of this since a) the project will not address the issue of forest land tenure (by supporting recognition of communities' forest land claims as per the Forest Rights Act/ FRA), b) Uttarakhand has shown little progress in implementation of the FRA in general¹³, and c) although some investment in community development and livelihood improvement is proposed under the project, it is seemingly somewhat token i.e. the majority of the investment will be towards ecological restoration and forest protection and development with most livelihood benefits to be achieved through convergence with existing projects/programmes.

The JICA Preparatory Survey Team has conducted a rapid assessment of the institutional capacity of the UKFD for more collaborative and participatory forest management approaches. UKFD staff at all levels need to understand participatory forest management in practice and various types of knowledge and specific skills (especially at grassroots levels) are required for effectively consulting and actively engaging communities in forest management. Overall, the curriculum for field staff is quite strong on technical forest management/silvicultural measures (as it should be) but there is very little attention paid towards social aspects such as Participatory Rural Appraisal (PRA), free, prior and informed consultation, participatory planning, conflict resolution, social assessment, gender, vulnerable groups, participatory M&E, grievance procedures etc. Moreover, it would appear that there is an inherent and pervasive under-appreciation of the value of such skills within UKFD as an institution overall.

In terms of implementing and monitoring social safeguards measures, the project will need to include a strategic approach towards building the capacity of UKFD staff, particularly at field levels, in terms of participatory forest management and social safeguards aspects on the one hand, whilst on the other, utilizing Field NGOs with the right skill sets to support implementation.

The basic approach of the JICA Preparatory Survey Team to environmental and social safeguard has been discussed with UKFD during a number of meetings.

¹⁰ Poffenberger, M. & Singh, C., 1996. *Communities and the State: Reestablishing the Balance in Indian Forest Policy*. In Poffenberger, Mark. and McGean, Betsy. Ed. *Village Voices, Forest Choices: Joint Forest Management in India*. Oxford University Press, Delhi.

¹¹ Nayak, P., 2002; *Community-based Forest Management in India: The Issue of Tenurial Significance*.

¹³ E.g. Desor, S (ed), 2013; *Community Forest Rights Under Forest Rights Act: Citizen's Report 2013*. Kalpavriksh, Pune and Vasundhara, Bhubaneswar with Oxfam India, Delhi on behalf of Community Forest Rights Learning and Advocacy Process

5.10.3 Key Challenges Associated with Particular Vulnerable Groups

The project will directly affect and work with a number of different kinds of vulnerable groups indeed it will prioritise these groups as target beneficiaries for various interventions. There will however be certain challenges for the project in working effectively with these groups, as summarized below.

Table 5.10.1 Key Challenges Associated with Vulnerable Groups

Group	Key Challenges
Women/Female Headed Households	<p>Main issue is that almost all UKFD field staff are men and therefore it can be difficult to facilitate active involvement of female VP members or SHGs</p> <ul style="list-style-type: none"> a. Lower education /literacy levels - affects grasp of project approaches, materials etc. b. Many women may lack confidence to participate in a meaningful way c. Women's drudgery may affect their ability to attend meetings, project events and participate in project activities d. Women may not be properly involved in forest management decision-making e. Female SC/STs may be particularly marginalized, poor and vulnerable
BPL Households and Scheduled Castes	<p>The poor and SCs by definition are socially disadvantaged/marginalized and often have:</p> <ul style="list-style-type: none"> a. Lower education /literacy levels - affects grasp of project approaches, materials etc. b. Poor social connections - there is a tendency for elite capture and social exclusion c. BPL households and SCs may be landless or have very limited land availability - affects their ability to benefit from certain livelihood interventions d. Limited access to financial capital required to invest in certain livelihood models e. A greater potential for developmental dependency
Scheduled Tribes	<ul style="list-style-type: none"> a. Use different dialects in the project area (e.g. Rajis) b. Live in extremely remote areas and are shy of contact with outsiders (e.g. Rajis, Bhotia) c. Have different cultural governance institutions (e.g. the Jansauri Khats) d. Have their own customary practices relating to lands and resources e. Have suffered from extensive land alienation in Uttarakhand (e.g. Bhuksa and Tharu) f. Maintain transhumant lifestyles and livelihoods (e.g. Bhotia)

Source: JICA Preparatory Survey Team

Chapter 6 ANALYSIS OF PROPOSED PROJECT (DPR) AND RECOMMENDATIONS

6.1 Overview of Proposed Project

The JICA Survey team was asked to review the proposals above and recommend necessary adjustments and elaborations to meet the requirement of JICA. The Survey looked into the following vital aspects regarding the proposed projects:

- a. Relevance, clarity and logic of project needs, rationale and justifications with reliable supporting data and information
- b. Appropriateness of basic project approach and objectives, especially in view of recent disaster started in June 2013
- c. Clarity, logic and objectively verifiable basis for target area selection
- d. Technical appropriateness of proposed project components and elaboration of project activities and their process/ procedures
- e. Clarity of modus operandi for project activities
- f. Integration of environmental and social safeguard requirements by JICA and other Indian authorities
- g. Appropriateness of proposed work quantities for each activities vis-à-vis total fund available and balance of fund distribution in relation to the overall project objectives
- h. Clarity on the basis of unit costs, total costs and annual fund allocations for 8 years
- i. Administrative appropriateness of implementation mechanism
- j. Clarity on the basis for the calculation of Economic Internal Rate of Return (EIRR)

It is important to note that the Detailed Project Report (DPR) was prepared by the UKFD and submitted to JICA before the disaster started in June 2013. The project justification, basic approach, objectives, project components, activities and budget needed to be revisited by the JICA Survey Team in order to address the issue of disaster management and mitigation.

The JICA Preparatory Survey Team suggests to re-structure the project components into 4 major components and a number of sub-components as indicated below:

■ Component 1: Eco-Restoration

- Sub-Component 1.1 Rehabilitation of Degraded Forest
- Sub-Component 1.2 NTFP Plantation
- Sub-Component 1.3 Biodiversity Conservation and Wildlife Management
- Sub-Component 1.4 Other Eco-Restoration Activities

■ Component 2: Livelihood Improvement and Community Development

- Sub-Component 2.1 Community Mobilizing and Micro planning
- Sub-Component 2.2 Entry Point Activities (EPA)/ Livelihood Improvement through Convergence
- Sub-Component 2.3 NTFP-Based IGA
- Sub-Component 2.4 Ecotourism
- Sub-Component 2.5 Non-NTFP Based IGA

■ **Component 3: Other Support Activities**

- Sub-Component 3.1 Preparatory Works (The establishment of Executing Bodies, recruitment of project staff members, preparation of various manuals and procedures, issuance of necessary administrative orders, organizing a series of orientations to the project staff members, procurement of Project Management Consultant (PMC) and other support organizations, selection of target sites, survey and mapping, preparation of Composite Management Plans and micro plans, preparation of Annual Plan, etc.)
- Sub-Component 3.2 Capacity Building of Executing Agencies and Other Stakeholders
- Sub-Component 3.3 Capacity Building of Village Level Institutions
- Sub-Component 3.4 Applied Research and Publicity
- Sub-Component 3.5 M&E (including baseline survey, MIS, GIS, periodical monitoring and evaluation, social auditing, etc.)
- Sub-Component 3.6 Project Continuity Strategy

■ **Component 4: Erosion Control and Sediment Disaster Mitigation**

■ **Component 5: Consulting Services (Project Management Consultants)**

The summary of the comparison between proposed project based on DPR submitted by the Uttarakhand Forest Department to JICA and the recommendations of JICA Preparatory Survey is shown below:

Table 6.1.1 Summary of Proposed Project

Particulars	As Per DPR	Recommended by the JICA Team
Project Objectives	To contribute to the eco-restoration, forest resource development, and the livelihoods improvement and income generation of the forest dependent households	To contribute to the eco-restoration, forest resource development, and the livelihoods improvement and income generation of the forest dependent households, while mitigating sediment disaster risks in highly vulnerable areas
Project Area	13 Forest Divisions, 1,000 Van Panchayat (VP)	<ol style="list-style-type: none"> 37 ranges in 13 Forest Divisions 6 Forest Divisions for sediment disaster mitigation measures 1,000 Van Panchayat (VP)
Key Targets	<ol style="list-style-type: none"> Approximately 50,000 ha of forest restoration and soil & moisture conservation (SMC) measures Approximately 500 ha of NTFP plantation Revitalization of approximately 1,000 VPs and EDCs Income generating activities by 2,000 SHGs Ecotourism development for 5 sites Wetland conservation for 10 sites Preparation of People's Biodiversity Registers (PBRs) in 20 Gram Sabah Sacred Grove conservation for 13 sites 	<ol style="list-style-type: none"> 50,000 ha of forest restoration and soil & moisture conservation (SMC) measures Approximately 500 ha of NTFP plantation Revitalization of approximately 1,000 VPs and Biodiversity Management Committees (BMCs) 13 modern nurseries Income generating activities by 480 clusters and 13 SHG Federations with 2,000 SHGs Ecotourism development for 7 sites Sacred Grove Sustainable Management for 13 sites with PBRs, to be registered as Biodiversity Heritage Sites (The target for the sediment disaster mitigation is to be determined.)
Project Duration	8 years	(No change)
Total project Budget	INR 6,464 million (in some places in the DPR, it is mentioned as INR 6,550 million)	INR 11,550 million
Implementing Agency	Uttarakhand Forest Department (UKFD)	(No change)

Source: Detailed Project Report (DPR) for Uttarakhand Forest Resource Management Project (UFRMP), Uttarakhand Forest Department, May 2013

The component-wise budget proposed in the DPR is summarized as below.

Table 6.1.2 Budget Proposal as per DPR

Unit: million INR

Budget Component	Budget
Regeneration of the degraded forest	2,719
Biodiversity management/ conservation	108
Community Development including capacity building of VPs	738
Livelihood	806
Supporting activities or Institutional capacity development	597
Procurement/ Construction (The total of the above including price escalation 281 and contingency 426)	4,968
Consulting Service (including price escalation 25, contingency 25)	250
Total of loan eligible portion	5,218
Administration cost	1,000
VAT	100
Total (Non Eligible Portion)	1,100
Interest During Construction	95
Commitment Charges	51
Grand Total	6,464

Source: Detailed Project Report (DPR) for Uttarakhand Forest Resource Management Project (UFRMP), Uttarakhand Forest Department, May 2013

The JICA Survey Team re-estimated the cost based on the present official minimum wage rate of the state government (INR 203 per day) and restructured project components and activities, including the additional components as Sediment Disaster Mitigation as summarized in the table below:

Table 6.1.3 Budget Proposal Recommended by JICA Survey Team

Unit: million INR

Budget Component	Budget
A. JICA Loan Eligible Portion	
<u>1) Procurement/ Construction</u>	
Component 01: Eco-Restoration	4,279
Component 02: Livelihood Improvement and Community Development	1,955
Component 03: Other Support Activities	638
Component 04: Erosion Control and Disaster Mitigation	1,400
Base Cost Total	8,272
Price Contingency	566
Physical Contingency	442
<u>2) Consulting Services</u>	
Component 05: Project Management Consultancy	368
Price Contingency	8
Physical Contingency	8
Total (Eligible Portion)	9,663
B. JICA Loan Non-Eligible Portion	
Land Acquisition	0
Administration cost	1,441
VAT	121
Service Tax	167
Import Tax	0
Total (Non-Eligible Portion)	1,729
C. Interest During Construction	118
D. Front End Fee (formerly known as Commitment Charge)	17
Grand Total	11,550

Source: JICA Preparatory Survey Team

Details of the cost estimate are illustrated in **Chapter 11** of this report.

6.2 Project Needs and Rationale

The DPR points out a number of issues related to forest and environmental degradation to build the argument of project needs and rationale as:

- a. With around 64.8% of the total geographical area of the State under forestlands, majority of the population is living in forest fringe villages, depending on forest resources for sustenance. Because of their remoteness, many government services and projects are not reaching to the forest-fringe communities, which would require a specialized, externally-funded project.

Additional Points by JICA Survey Team: The 64.8% of total forest area under various classes means 3,465,101 ha, of which 2,426,078 ha or 70% are the Reserved Forests under the direct control of UKFD. This indicates the needs and importance of capacity building of UKFD. Although 64.8% are classified as forestlands, 45.8% or 2,449,600 ha is under the actual forest vegetation as large areas in the forestlands are located above the tree line without any vegetation. Geologically, Uttarakhand belongs to young folded mountains of the Himalayan System, which has made these ranges one of the most fragile ecosystems and vulnerable to adverse effects of climate. Natural calamity results in landslides, slope failures, siltation of river bed sides and uprooting of trees in the forests in this fragile mountain terrain. In any case, majority of rural population is residing close to forests and forestlands in Uttarakhand because of the large extent of forests, and the available resources with the government is inadequate to address the needs of large number of forest dependents.

- b. Still approximately 80% of forests in the State is considered to be degraded (Scrub, Open Forest, Moderately Dense Forest as per the classification of crown density by the Forest Survey of India), which require immediate rehabilitation, although there has been some encouraging improvements in the remote forest areas in the past ten years.

Additional Points by JICA Survey Team: According to the India State of Forest Report (ISFR) 2005 and 2011 by Forest Survey of India (FSI), approximately 150,000 ha of good forests have become degraded forests (Scrub, Open Forest and Moderately Dense Forest, as per the crown density classifications of FSI) between 2005 and 2011, while mere 300 ha of total forest cover increased in the State during the same time. This indicates that the quality of forest has deteriorated greatly, and the needs of Eco-Restoration interventions are high. The hilly forests in the state are devoid of adequate silvi-cultural operations due to the ban on green felling above 1,000 meter, resulting further forest degradation and reduction of forest productivity. There is a pressing need of re-introducing proper eco-restoration practices in the state.

- c. The human population is continually increasing, and slow growing local industries and fragmented social groups (especially for the Scheduled Castes and Scheduled Tribes) are unable to absorb the excess labor force in the rural areas. Poverty, though the ratio of below poverty line (BPL) is decreasing, still exists especially in the remote forest-fringe villages, and alternate sources of livelihood are limited in those remote areas, which forces the local people to continue to remain excessively dependent on the forest resources. Women continue to be overworked for caring the cattle, collecting fuel wood and fodder and fetching water, sources of which often situated at considerable distance from the villages, in addition to agricultural works and all the household chores. All of these resulted in squeezing environmental resources, land availability, forests and grasslands, water resource, etc. by the local population.

Additional Points by the JICA Survey Team: The population in the rural areas of Uttarakhand has almost doubled in 30 years from 5.7 million in 1981 to 10.1 million in 2011. The rate of BPL population is 11.26%, which is much lower than the national average of 21.9%. Unemployment was 4.9% in 2010, which was lower than the national average of 9.4%, but potential underemployment (involuntary part-time workers despite of seeking full-time job) is expected to be much higher. It should be also noted that one of the unique features of Uttarakhand is that historically, in the hill districts, the Schedule Castes also reside in the forest-fringe areas, unlike other states in India where SC population is usually concentrated in the urban sector (total SC population in Uttarakhand is 1.89

million or 18.8% of the total population). It is more difficult for the SC population to find a decent job, and such excess labor in the forest-fringe areas increases the risk of forest degradation.

- d. The land holdings are small and fragmented in the hilly areas, and the modern input-intensive agriculture and marketing is severely constrained because of the remoteness. The credit infrastructure and facilities are inadequate. In other areas, a sizeable male members in the communities out-migrated to bigger towns in search of livelihood options. All these factors have meant that a sizable part of cultivable land remains unutilized and degraded, which create various environmental problems

Additional Points by the JICA Survey Team: The average landholding in the hilly areas is 0.68 ha, and this small landholding is due mainly to the limited land availability, which further fragmented into smaller plots in terrace. It makes agriculture unprofitable to support livelihood. This forced the rural population to heavily depend on the cattle rearing. The present cattle population of Uttarakhand is 4.94 million, and there is a deficit of about 9.23 million tons of green fodder per year in the state, resulting in the excessive grazing in the forest areas. Similarly, there is a gap of about 1.90 million tons of fuel wood between the supply and demand in the state, which is mainly removed as head loads from the forests by villagers. More than 80% of household use of timber is from forest for construction of houses, as about 4.78 million cubic meter of timber is required at one time for house construction. About 2,000 hectare forestland is damaged every year due to forest fire, mainly caused by the manmade fire. Low level of awareness of local people and low capacity of VPs and other community-based organizations are observed. All of above result in irregular and overexploitation of natural resources.

- e. Appropriate policies and institutional frameworks, such as VP Act 2004, are in place, and broader social and political supports exist for environmental protection and VP movement, all of which create enabling environment for the JICA project to operate. While the Reserved Forests are also degraded, there are other schemes to rehabilitate the Reserved Forest (RF).
- f. Additional Points by the JICA Survey Team: So called “non-territorial divisions (i.e., Soil Conservation Divisions, Civil & Soyam (CS) Forest Divisions Dam Divisions) have been created in the state over the years to extend technical assistance to VPs and Revenue Department for their management of forests outside the Reserved Forests. In the past, a number of forestry-related projects and programs have been introduced in the State but implemented mainly by “territorial divisions”. Therefore, the forests under the management of VPs and technical guidance of non-territorial divisions have largely remained unattended, and there is an urgent needs to intervene in those areas. The state has 12,089 VP managing 544,964 ha of forests, which is 15.73% of total forest area of the state. However, many of VPs as a vital village-level institution are still weak to manage their forests properly and do not get support from the government after their creations due to budgetary limitations

Additional Points by the JICA Survey Team: Out of 12,089 VPs in the state, 7,791 VPs (65%) managed small areas as less than 20 ha of forestlands. 7,322 VPs (61%) do not have a micro plan. No forest division has prepared a Composite Management Plan for VP, which is required under the Uttarakhand VP Act 2005. Without a micro plan and Composite Management Plan, the villagers/ members of VP may not be able to undertake proper silvicultural operations and harvesting. The needs are significant for the capacity building interventions to support the VPs and executing agency.

- g. Man-animal conflict is severe, and wild boars and monkeys cause a considerable damage to the agricultural crops in hills. Proper forest conservations, rehabilitation and management are important for religious and cultural aspects also as the state is known for having a number of Hindu pilgrimage sites

Additional Points by the JICA Survey Team: The JICA Preparatory Survey substantiated above arguments by collecting reliable additional data and information. The results of the GIS analysis have been reflected in this Final Report (FR).

To strengthen the project justification, the Survey Team explored the following vital points.

- a. The recent disaster started June 2013 in the state was absolutely devastating, and the damages caused by the calamity were unparalleled in history in the region, if not in the country. Over 6,000 people lost their lives or still missing, and more than 100,000 people lost their homes, if not their entire villages. Nearly 8,000 km of roads were destroyed, and other key lifelines and infrastructure were put out of order, as electricity networks, water facilities, public buildings, irrigations, telephone networks, etc.

The deadly flashfloods and debris flows that crushed people's lives and properties were caused by massive landslides and slope failures, many of which were originated from forests under the control of UKFD. It has proven that the effort of UKFD in erosion and flood control within their forestlands has not been adequate. Based on the preliminary discussions and field visits by the experts of JICA Survey Team revealed that UKFD critically lacks technical expertise and field experiences in geotechnical surveys, analysis of erosion mechanisms, identification of appropriate technologies and countermeasures to such erosions, execution of appropriate mechanical and vegetative slope stabilization works, soil/ debris retaining works, water flow control measures, etc. within the forest areas. There is a great need for technical assistance to the UKFD on erosion and flood control as well as the financial assistance to implement/ experience such works. It should also be noted that no donor agencies, apart from JICA, is planning to support the UKFD or addressing the issues of forest areas where the major problems of recent disasters have originated. The support of JICA would contribute greatly to the recovery from the recent disaster and to the mitigation of future disaster risks.

- b. The JICA Survey Team also reviewed the following aspects of project rationales:
 - ✓ Relevance to international initiatives and commitment of both Japanese and Indian governments to mitigation of and adaptation to the climate change as a part of United Nations Framework Convention on Climate Change (UNFCCC), as well as the promotion of sustainable development and green economy declared during the Rio +20 Summit
 - ✓ Relevance to the commitment of both governments to the Convention on Biological Diversity (CBD) and other relevant international treaties
 - ✓ Relevance to the policies and programs of both governments on environmental improvement and poverty alleviation.
 - ✓ Anticipated positive environmental impacts as a result of project, based on the empirical evidences of similar interventions and validated benchmarks regarding micro (village-level) status of water tables and regime, soil erosion, soil fertility and biodiversity.

6.3 Basic Project Approach and Objectives

The DPR states that "The Overall Goal of the proposed project is to contribute to eco-restoration and development of forest resources and improvement of livelihoods & income generation of the forest dependent people." It is clear that the project has two equally important goals. One is the rehabilitation of degraded forests to revise the ecological balance, and another is the livelihood improvement of forest-fringe villagers who are the guardians of local forests.

To achieve these dual goals, the project adopts the following basic approaches:

- a. Empowering forest-fringe communities, particularly women, through sustainable livelihoods and ensuring positive involvement of rural people in managing their own environment
- b. Strengthening community institutions as VPs and Biodiversity Management Committee (BMC)
- c. Alleviating poverty of the rural poor through income generating interventions
- d. Planning and implementing site specific technical and scientific forestry interventions, including soil and moisture conservation, restocking of degraded areas through appropriate silvi-cultural

operations utilizing the inherent potential of available root stock, under planting with suitable species, block plantations in blank patches

- e. Promoting inter-sectoral convergence
- f. Interventions would be planned and implemented by VPs and BMC.

The JICA Survey Team considered that the basic approaches listed above are all important and appropriate, and in line with the goals and objectives of project. In addition to above, the Survey Team suggests the following basic approaches to be included:

- a. Capacitating the executing agency (Uttarakhand Forest Department) and other concerned agencies and organizations (such as Revenue Department, PRI, etc.) to contribute to the eco-restoration outside VP (Reserved Forests, CS Forests, etc.)
- b. Promoting forest-based and non-forest based enterprises (such as the value addition and marketing of medicinal & aromatic plants, resin, food items as honey, natural fibers, natural dyes, utilization of forest biomass, ecotourism, handicrafts, off-season vegetable, dairy products, etc.) to generate sustainable employment, develop industries and enhance the value of forests
- c. Caring for the socially disadvantaged groups in the society, such as Scheduled Castes, Scheduled Tribes, forest dwellers, women, landless and other vulnerable people through proper safeguard measures as per the JICA guideline and applicable Indian laws and regulations
- d. Utilizing international platforms, such as UN-REDD+, Ramsar Convention, UNESCO World Heritage Sites (natural), UNESCO Man and Biosphere (MAB) Program, etc. to draw more resources and generate momentum for sustainable management

6.4 Target Areas and Beneficiaries

As discussed in **Section 3.1** of this report, **37 priority Forest Ranges** were selected in **13 Forest Divisions** (in **10 Districts of** Bageshwar, Pithoragarh, Almora, Chamoli, Champawat, Nainital, Tehri, Pauri, Uttarkashi and Dehradun), using a set of prescribed selection criteria and following the selection process illustrated in the previous section. These 37 priority Forest Ranges in 13 Divisions are listed below:

Table 6.4.1 Selected Priority Forest Ranges

Division	Range	Division	Range
Alaknanda SC*	Aser Simli Range	Ranikhet SC*	Gagas Range
	Attagad Range		Gairsain Range
	Tharali Range		Chanthria Range
Almora CS	Gananath range	Tehri Dam – 1	Dharkot Dam Range
	Jageshwar Range		Nailchami Dam Range
	Kosi Range	Bageshwar	Kapkot Range
Nainital SC*	Mukteshwar Range		Dharamgarh Range
	Okhalkanda		Bageshwar Range
	Ramghar Range	Champawat	Lohaghat Range
Pauri CS	Pabo Range		Bhingrarav Range
	Pauri Range		DebiDhura Range
	Satpuli RangePauri Range	Narendranagar	Maniknath Dangchura Range
Lansdowne SC*	Chalusain Range		Shivpuri Range
	Jaiharikhal Range		Saklana Chamba Range
	Matiyali Range	Pithoragarh	Pithoragarh Range
Ramnagar SC*	Ringlana Range		Didihat Range
	Nainidanda Range		Gangolihat Range
	Dhumakot Range	Mussoorie	Mussoorie Range
			Raipur Range

*SC: Soil Conservation Division

Source: IICA Preparatory Survey Team

*SC: Soil Conservation Division

Source: JICA Preparatory Survey Team

In the above 37 Priority Ranges, 809,889 ha of the forest areas exists. Out of which, 16 % or 131, 627 ha is the very dense forest and 57% or 459,899 ha is the moderately dense forest. Open area occupies 25% or 203, 892 ha of the total forest areas in the priority ranges. There are 5,160 ha of the scrub areas in the priority ranges. Details of Priority ranges are provided in **Attachment 6.4.1**.

Table 6.4.2 Forest Areas and Forest Types in the Priority Ranges

	Total Forest Area	Very Dense		Moderately Dense		Open		Scrub	Water	Non-Forest	Total Range Area
	ha	ha	%	ha	%	ha	%	ha	ha	ha	ha
Alaknanda SC*	100,423	15,958	16%	54,026	54%	30,439	30%	216	41,277	141,916	216
Bageshwar	97,770	14,794	15%	58,659	60%	23,929	24%	47	79,169	176,986	47
Champawat	56,504	14,180	25%	29,854	53%	11,931	21%	19	31,431	87,954	19
CS Almora	46,151	6,438	14%	30,885	67%	8,590	19%	6	30,344	76,501	6
CS Pauri	55,562	9,202	17%	24,333	44%	18,822	34%	49	40,933	96,544	49
Mussoorie	23,735	1,576	7%	13,631	57%	6,506	27%	-	9,852	33,588	-
Narendranagar	72,109	6,228	9%	30,555	42%	30,737	43%	566	42,362	115,038	566
Pithoragarh	82,597	20,741	25%	40,552	49%	21,038	25%	247	51,296	134,139	247
SC* Lansdowne	41,524	780	2%	29,790	72%	10,059	24%	105	33,318	74,947	105
SC* Nainital	62,158	12,135	20%	42,667	69%	7,243	12%	108	24,931	87,197	108
SC* Ramnagar	72,543	17,113	24%	47,184	65%	8,246	11%	2,848	27,305	102,696	2,848
SC* Ranikhet	40,363	6,153	15%	21,859	54%	12,275	30%	8	22,394	62,765	8
Tehri Dam - 1	58,449	6,330	11%	35,903	61%	14,077	24%	942	52,649	112,040	942
Total	809,889	131,627	16%	459,899	57%	203,892	25%	5,160	487,261	1,302,310	5,160

*SC: Soil Conservation Division

Source: UKFD, compiled by JICA Preparatory Survey Team

Five particular divisions were most affected by the recent disaster, and 6 forest divisions cover those 5 districts, namely:

- a. Uttarkhashi Soil Conservation Division (Non-Territorial)
- b. Uttarkhashi Forest Division (Territorial)
- c. Rudraprayag Forest Division (Territorial)
- d. Badrinath Forest Division (Territorial)
- e. Bageshwar Forest Division (Territorial)
- f. Pithoragarh Forest Division (Territorial)

The total degraded forests in these selected ranges are about **360,000 ha**, which is the total potential project areas, for which **50,000 ha** would be the direct intervention areas. The JICA Survey Team organized a stakeholder consultation, wherein concerned officers from the field, relevant agencies and organizations, major NGOs and private sectors reviewed the recommendations of the Survey Team and gave their views on the target areas, among others. The target areas recommended above were also discussed, and the views of participants were incorporated. **Chapter 4** of this report discussed the result of the stakeholder consultations.

As discussed in **Section 6.5.2**, target villages will be selected in cluster within micro-watersheds so that the project intervention on the eco-restoration will have visible impact on the health of such micro-watersheds. The total size of micro-watersheds within the 37 selected ranges is 1,234,447 ha, of which 365,570 ha are forests outside the Reserved Forest, of which 321,003 ha are degraded forests, which are the potential target intervention areas under the project. The ratio of the sizes of micro-watersheds and degraded forests are 3.85 : 1. If the same ratio would be applied to the project intervention area (50,000 ha), it is estimated that 192,500 ha of micro-watersheds would be covered by the project. Therefore, **the project impact area will be 192,500 ha.**

The expected beneficiaries of project will mainly be the members of VPs and BMCs, who reside close to the forest areas and whose livelihoods are directly dependent on the forest resources. The DPR indicates that the total number of target VP and BMC is approximately 1,000. If the average number of members is 64 (average number of households in a village in Uttarakhand is about 80, and if 80% of 80 households, about 64 households will be the member. An average household members in Uttarakhand rural area is 4.9), **64,000 households** or **310,000 forest dependents** would benefit from the project.

Through the Entry Point Activities (EPAs), selected village infrastructure development and community disaster preparedness will be supported as discussed in **Section 6.6.1** of this report. **Villagers other than VP members would also benefit** from them. Indirectly, people residing downstream of micro-watersheds would also benefit from the project as the water regime of the watershed would improve, and slope and sediment-related disaster risk would be reduced.

6.5 Analysis on Proposed Eco-Restoration Component and Activities

6.5.1 Policy Initiatives

The state, immediately after its creation, formulated its Forest Policy in 2001 and has been explicit on its intentions for conservation and management of forest with the involvement of communities. The following policy re-direction and practices would enable the VPs to implement the Project ensuring forest conservation and livelihood improvement of forest dependent people.

- The State VP Rules 2005 indicate the preparation of Composite Management Plan and micro plan for VP areas to be approved by the Uttarakhand Forest Department. At the same time, the direction of Supreme Court of India indicates that forestry operations should be limited if the forest areas have no plan duly approved by the Government of India (MoEF). It is suggested that the proper legal framework be discussed to ensure the legitimacy of forestry operations within VP and C&S forest in view of the SC decision.
- The State VP Rules 2005 indicates that the VP's net income from the sales of NTFP and other sources (e.g., compensations, fees, etc.) shall be deposited in Panchayat Forest Fund and distributed and utilized in the following manner:
 - 30% to Gram Panchayat for project of public utility
 - 40% to VP for maintenance of VP
 - 30% to VP for local utility projects and their maintenance

30% to GP is a significant contribution, which would reduce the incentives of VP to improve/ maintain the productivity of VP areas. This policy may be revisited.

- Majority of the VPs have small areas to protect and manage, which is insufficient to meet their requirements of fuel, fodder and timber. In order to ensure sustainable management of all the forest types adjacent to such VPs, the management areas may be extended to the CS Forests and Reserved Forests as per the provision of the VP Rule 2005, which shall be duly notified as VP areas by the concerned authority.

- In the context of village and area development, the role of VPs is negligible. VPs may be assigned greater responsibility for their own village development. Priority access to funds under different programs and schemes should be emphasized for the good performing VPs.
- A Coordinating Officer for VPs may be appointed at the Block level, who would be exclusively responsible for ensuring coordination between VPs and Revenue Department in order to ensure timely elections, grievance/dispute redressal, removal of encroachments in Panchayat Forests etc.
- The policy on the ban on commercial green felling above 1,000 m above sea level affected greatly, and necessary silvicultural operations have been neglected largely in those areas. It resulted in the further degradation of forest quality and productivities. Pilot studies have been carried out by the research wing of UKFD and Forest Research Institute (FRI), and their recommendations should be revisited, and necessary actions may be taken.
- There are restrictions on harvesting of 34 medicinal plants/ NTFPs from forest. This policy may be revisited for some species which are available for harvesting. Wherever the VPs are carrying out plantation of these medicinal plants/ NTFPs in the Panchayat forest they may be allowed to harvest these species under the supervision of Range/FMU. Sustainable harvesting protocols are to be developed for these species and the VPs have to follow these protocols for harvesting. The UKFD may revisit the existing policy to allow the VP members to harvest these produces from their own forest area.
- VPs may be allowed to plant herbs in their forest areas for replenishing the NTFP resources in their forest.
- Especially for piloting a cluster development initiative under the Project the State Government may revisit the existing policy of collection and trade of Lichens and Moss grass and give priority to the local VPs and Federation of SHGs to procure lichens and moss grass from one Forest Division (Badrinath Forest Division), and add value and transport the produce to the *Mandis*. The VPs and Federation of SHGs shall pay the necessary royalty and taxes to the UKFD.

6.5.2 Selection of Project Sites

(1) Selection Criteria

As discussed in **Section 6.4**, target Forest Ranges were recommended by the JICA Survey Team based on a set of criteria and discussion with UKFD, and 360,000 ha was selected as project areas. Within target areas, target sites for direct project interventions, i.e., 50,000 ha by VP and BMC will be identified during the project implementation.

The DPR indicated that degraded forest blocks of VPs will be selected using a “selection matrix” for the preparation of master list, but the matrix was not provided in the report. It also indicated that size of VP, situation in the watershed, potential for cluster formation, presence of other line department programs, proven track record, willingness of VP members to be associated with the project and their legal status should be considered. The DPR also mentioned that the intervention areas will be selected on the basis on clusters in micro-watersheds.

The JICA Survey Team recommends the following selection criteria for target sites, and this recommendation was shared with UKFD already:

Minimum Criteria:

- a. Located within the selected priority ranges
- b. Existence of a VP duly constituted
- c. Existence of an official VP Resolution, expressing the willingness of the VP members (both general body and executive committee) to associate with the project through free and prior informed consent

- d. Non-existence of similar ongoing projects/ programmes at present or planned

Priority Criteria:

- a. Larger size of degraded forests (Scrub, Open Forest and Moderately Dense) within VP as well as CS Forests and Reserved Forests that are located close to the degraded VP
- b. Good track record of the performance of executive committee of VP rated by the project
- c. Larger number of populations of ST, SC and BPL, with due considerations to transhumants
- d. Existence of general support from Gram Panchayat

Additional Criteria (those sites that were not selected based on above Priority Criteria would be selected/ added if meet the below criteria):

- a. Geographical proximity of VP to other priority VP within a same Gram Panchayat or Development Block for cluster formation (VPs within a same micro-watershed will be preferred. Although the number of VPs in a Gram Panchayat or Development Block is anticipated to be 2 at most, the project may consider setting the maximum number of VPs to be selected within the same Gram Panchayat or Development Block as 3.)

For the Priority Criteria, potential VP that meets the Minimum Criteria will be rated and ranked as per the Priority Criteria. Some weightage may be given to each criterion, which needs to be discussed with the executing agency and other stakeholders. A matrix (scoring sheet) should be developed, as indicated in the DPR, based on the above criteria and circulated to concerned field functionaries of project management units.

In case when the eco-restoration works under the project is not possible by the selected VP, and when alternative VPs cannot be found, the works may be carried out by the UKFD. However, wherever possible, VP should be the implementing organization.

When innovative approaches and method for eco-restoration are available at external organizations as NGO, the work may be entrusted to such organization for creating replicable models. Maximum one such model may be taken up at each target division.

(2) Selection Process

The JICA Survey Team suggests the following selection process:

- a. Finalization of selection criteria, process and matrix (scoring sheet) and authentication (issuance of Administrative Order);
- b. Organization of orientation meeting for field level project personnel on the selection criteria and process;
- c. Organization of range level consultation meeting with all the representatives of VP to assess the willingness of each VP. For this, a VP resolution and relevant documents need to be submitted to the Executing Agency during the meeting, such as meeting registers, books of account, etc. that the VP has been maintaining;
- d. By the concerned field officers using a GPS handset, digitization of boundaries of all VPs that met the minimum criteria;
- e. Compilation of GPS data at the GIS laboratory of UKFD and analysis of degraded forests within and around VPs;
- f. Identification of priority VPs and consultation with concerned Gram Panchayats;
- g. Preparation of a master list of potential VPs using a prescribed format and authentication of the list by the DMU officer; and
- h. Selection of VP from the master list for each batch (when necessary, revisit the master list, revise and authenticate it accordingly).

6.5.3 Demarcation of Intervention Area and Micro planning

Under the proposed UFRMP, the regular process of micro planning should be followed. JICA has vast experience in implementing forestry projects in India for years, and the experiences, lessons learned and established procedures of micro planning in other projects in other states shall be referred to.

However, the State of Uttarakhand has unique system of “VP”. Therefore, the regular micro planning process in other states needs to be modified when applied it here. Based on the Uttaranchal Panchayati Forest Rules, 2005 a Composite Management Plan (CMP) shall be prepared for the VPs at the Divisional level. Based on the CMP, micro plans shall be prepared by VP.

(1) Demarcation, Survey and Mapping of VP Areas and Intervention Areas (GPS survey)

All features on earth’s surface can be mapped based on its location coordinates that are unique from one another. Traditionally, the survey work was being done in UKFD using chain and compass method that is based on local coordinate system. Thus, it is extremely important to survey and map the entire VP areas and project intervention areas as well. Under JICA project all VPs need to be mapped using GPS instrument and marked on the ground by using paints or other method. While the permanent pillar posting will be quite expensive, cost effective method should be adopted.

Also, all intervention areas and assets created under the project need to be mapped. The boundary of intervention areas will be fenced by the stone walls, so there is no need to mark the area. The GPS data collected in the field should be sent to the PMU for preparation of maps.

As the project would be implemented in 4 batches, thus for Batch1 &2 the GPS based survey work would be outsourced to specialized agency who will do the survey work along with the UKFD field staff. This would ensure timely completion of GPS based survey work as well as help in practical GPS training to the field staff in the initial period of the project. The third batch afterwards would then be surveyed by the field staff themselves as they would then be trained in doing the GPS survey work.

(2) Suggested Approach and Guiding Principles for Micro planning

The Survey team suggests following approach and principles for micro planning:

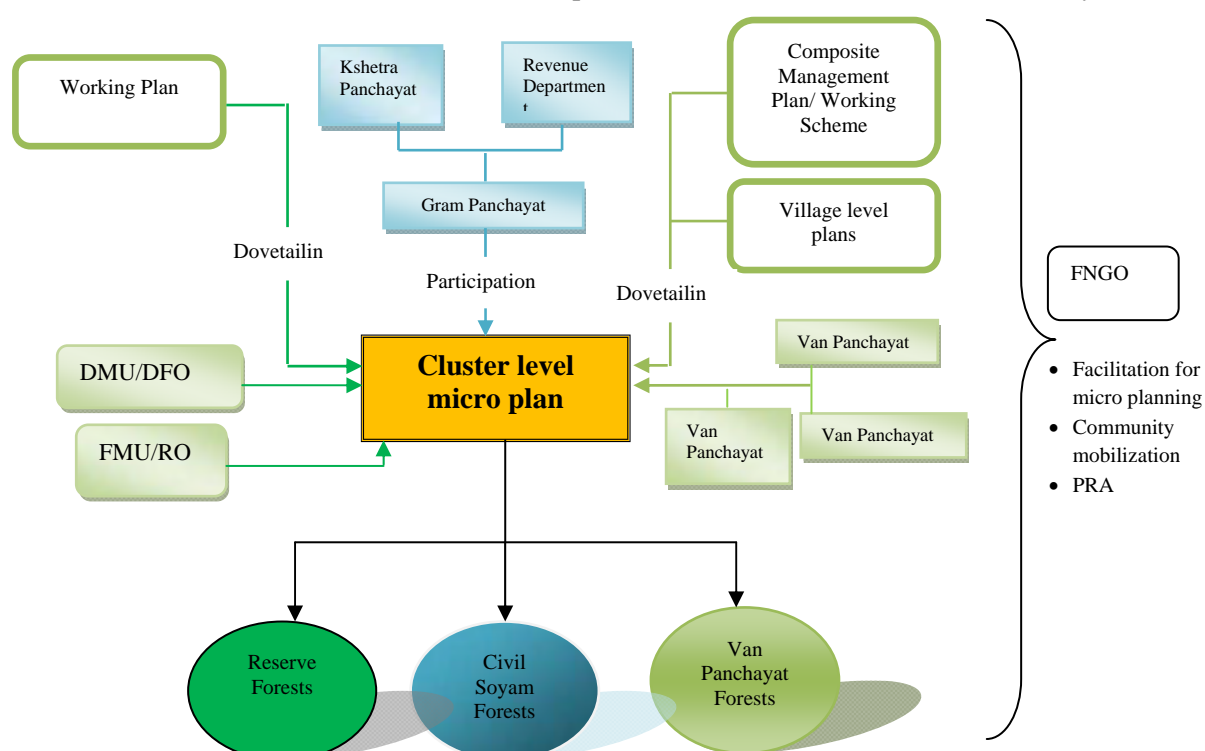
- a. Established in a participatory manner involving different socio-economic and interest groups in the community;
- b. The process is flexible and iterative;
- c. Involves use of need-based participatory tools designed keeping in mind the characteristics of communities;
- d. Process designed in a manner where the vulnerable and weaker sections of the community, such as ST, SC, women, landless and others, find scope to articulate their views, problems and needs;
- e. Holistic and multi-sectoral in scope;
- f. Social, ecological and institutional understanding are integrated;
- g. Focus on the entire Panchayat forest (should not be limited to target area for treatment in the VP);
- h. Prepared, approved and owned by the VP / community;
- i. The role of FNGOs and Forest staff would be to inform, support, facilitate and document. The role of the VP / villagers would be to discuss, analyze, prioritize, negotiate and decide;
- j. Process leads to capacity building of the VPs;
- k. New project micro plans build on the existing current micro plans instead of repeating the whole process;
- l. Micro plans does not result in mere ‘wish lists’, but reflects the actual needs and priorities of the concerned community;

- m. Micro planning process and proposals are gender and poor sensitive;
- n. Process could also involve various stakeholder including line departments;
- o. In line with the CMP and working plan prescriptions (where required); and
- p. Community priorities and decisions within the legal framework respected by all concerned.

(3) Cluster Level Micro plan

Given the scope, objectives and focus of the proposed project on eco-restoration and livelihoods strengthening as well as the provisions under the current legal framework as defined by VP Rule 2005 for VP level micro planning, the JICA Survey Team suggests preparation of plans at two levels – VP and Cluster – depending on the field situation.

The purpose of this approach would be to plan the VP Forest, RF and CS forest areas within the cluster in order to ensure efficient management of forest resources. This cluster approach would ensure synchronizing among the Composite Management Plan (CMP) for VP, Working Plans for RF, and village-wise plans for C&S Forest to be integrated as a Cluster Level Micro Plan (CLM). The participation of Gram Panchayat, Kshetra Panchayat and revenue department officials would be sought, especially for the planning on the VP and CS forests. Such an approach would help strengthen the existing institutional arrangement of micro planning for Panchayat Forest as well as link them effectively to interventions for livelihoods strengthening at cluster level. The FMU and the DMU shall play an important role in the preparation of CLMs and in cases where a cluster overlaps two or more ranges. The CLM could also include the cluster level investment for the primary processing units so that the IGAs will not remain as a micro scale operation in isolation that is not economically viable.



Source: JICA Preparatory Survey Team

Figure 6.5.1 Suggested Framework for Preparation of Cluster Level Micro Plan (CLM)

In order to prepare the CLM, the Survey team suggests that a project specific cluster level working group (WG) be constituted. The WG would have representatives from the concerned VPs, Gram Panchayat, FMU and Field NGO (FNGO). Other technical experts and advisors should be included if needed. The role of the WG would be to prepare the CLM by dovetailing all the information from

each VP under the cluster. The WG would also provide opportunities for convergence and closer coordination with Gram Panchayats.

Under the project, the FNGOs and Field Management Unit (FMU) shall extend the technical support on the micro planning. The participation of village communities and the Gram Panchayats shall be ensured in this process. It is also extremely important to establish an official mechanism and norm for territorial divisions and non-territorial divisions in the project area to coordinate properly for the micro planning as the RF is under the management of territorial divisions, and other forests are under the management of non-territorial divisions within the same area. The FMUs from all concerned ranges would be involved in the preparation of micro plans/ CLMs.

It is suggested that such CS Forests and Reserved Forests to be brought under the management of VP under the project be officially notified as VP areas by the concerned authority so that the coordination among Working Plan, Composite Management Plan and Micro plan will be streamlined.

UKFD does not have the manual for preparation micro plan. Nevertheless, Forest Training Academy (FTA) has the training materials and curriculum, which are used during the VP training programmes that are conducted at the academy. At the early stage of the implementation, the project will revisit the available materials and documents to develop the micro planning manual that can be adopted by the project. Such material will help FMUs and FNGOs to carry out the micro planning exercise in the field level as well as their training.

A micro plan/ CLM shall be revisited annually during the annual planning for the next year with the support of FNGO and other project management functionaries. The plan may be revised and approved by the competent authority, when necessary. Towards the end of the project, all VPs will review the micro plans in order to assess the achievement and incorporate the actions in the post project period.

(4) Suggested Contents of CLM/ Micro Plan

It is suggested that the micro planning under UFRMP would include the following elements:

a. Natural resource management

- ✓ *Forest development and management* – would include aspects related to enhanced protection measures - forest fire management; regulated / rotational grazing; addressing encroachment and illicit felling. Management / silvicultural prescriptions for different patches based on forest condition. Utilization plan for meeting the bona-fide needs of the community as well as income for VPs
- ✓ *Biodiversity conservation (where relevant)* – conservation measures for rare and endangered species

b. Livelihood strengthening & micro-enterprise development (at Cluster level also)

- ✓ *Demand and supply of forest products* – gap assessment; options & strategies
- ✓ *NTFP based enterprises* – status, scope & potential based on local skills, raw materials availability & market
- ✓ *Other enterprises* – scope & potential based on local skills, raw materials availability & local market

c. Community development

- ✓ Physical infrastructure and facilities
- ✓ Activities addressing Basic Human Needs (BHN)

d. Institutional development of Community Based Organizations (VPs)

- ✓ Capacity building needs – institutional, technical, financial

(5) Suggested Process of Micro Planning

1) Preparatory Activities

Preparation and approval of Composite Management Plan (CMP) and its approval by authorized entity¹ is the foremost requirement before undertaking the micro planning process. The CMP would provide the broad framework, within which the micro plans can be developed, appraised and approved. The scope and design of CMP, however, needs careful planning. As the CMP is supposed to provide only a broad framework and main guiding principles for the micro plan, it should not be too prescriptive². The broad framework defined by the CMP could include:

- ✓ Details of the VPs in the area, including area of forest managed by them
- ✓ Details of existing system of forest management followed by VPs for protection and utilization
- ✓ Major issues / problems related to management of Panchayat Forest by VPs through the identification of strengths, weaknesses, opportunities and threats (SWOT)
- ✓ Broad prescriptions given the legal framework (do's and don'ts as per the existing rules)
- ✓ Broad prescriptions for silvicultural management given the main forest types in the Forest Division etc.

If the approval of CMP by the Ministry of Environment and Forests (MoEF) requires specific technical prescriptions, it is suggested that approval from appropriate authorities should be sought at the level of micro plans instead.

2) Key Steps in Micro Planning

- i) **Building trust and understanding** on the project objectives and approach: It would include activities such general body meetings to explain the purpose and seek the permission of the villagers for the process; seeking community consent; signing of MoU; identification and implementation of entry point activities
- ii) **Survey & mapping:** GIS based survey of proposed treatment area.
- iii) **Baseline survey, Participatory Assessment and Situation analysis** of social, economic, institutional and natural resource related aspects resulting in identification of different interest groups, including ST/ SC/ women/ landless and problems as well as opportunities related to different sectors using PRA tools. Base line surveys would also be integrated with this step.
- iv) **Development of Community Vision** by villagers regarding their village, livelihood and natural resources would set the framework for micro planning process.
- v) **Prioritization and analysis of the problem(s) or issue(s)** to identify root causes. Tools such as causation diagrams would be used to analyze the prioritized problems for different sectors – forest / natural resource; livelihood / income generation; village /community development; community institutions (VP) and from the point of view of different socio-economic groups including ST, SC, women, landless and other weaker sections of the society.
- vi) **Identification, analysis and selection of appropriate options for interventions** to address the problems related to village development, livelihood development and natural resources. Analysis would involve prioritization based on ranking criteria that are collectively developed. These may include factors such as cost-effectiveness, practicality, and time-frame involved, considerations to the weaker section of society, etc. It could also involve analysis of proposed options for their feasibility – technical, social, economic, environmental and operational. This stage concludes with a consensual selection of tentative interventions – after negotiation between competing

¹ According to the existing guidelines of the MoEF, all forest development and management plans for area above 10 ha needs approval of Regional Office of MoEF. Also, the National Working Plans Code provide a JFM Working Circle and mentions that actual work would be according to village / Van Panchayat specific micro plan.

² The Working Schemes are prescriptions for various activities in a given forest area within a given duration.

interests if required -- that are best-suited to address the identified problems/issues related to the project objectives.

- vii) **Preparation of the micro plan:** Based on the most feasible options and activities, a five year micro plan would be prepared by the VP specifying objective, activities, target & indicators, time-line / schedule, budget, source of funding, division of responsibilities, and extent and nature of community contribution etc.
- viii) **Development of Annual Work Plan:** The work plan would be broken into annual work plans and the activities would be implemented after due approval from concerned entities.
- ix) **Presentation and approval of micro plan & annual work plan in General Body:** Members of VP with the support of facilitators present the final outputs of the micro planning process with the help of maps and diagrams prepared during the process in a General Body meeting to discuss and formally approve the micro plan and annual work plan. Representatives of various line departments and block offices could also be invited to this meeting to provide their inputs.
- x) **Approval of micro plan and work plan by Sub-DFO and DFO:** The community approved micro plan and work plan would be sent to Sub-DFO and DFO for approval. It is also possible that the concerned Sub-DFO and DFO attend the General Body meeting and clarify any doubts. This would fasten the approval process.
- xi) **Documentation of Micro plan:** The micro plan process and outputs would be documented and compiled in the form of a document. The written plans will facilitate its approval and smooth implementation. A copy of the community and Sub-DFO's and DFO's approvals would be included and the original copy would be retained with the VP.
- xii) **Review of Micro plan:** The micro plan would be reviewed and updated at least once in a year and approval would be taken for changes made in the micro plan in one of the bi-annual general body meetings.

6.5.4 Rehabilitation of Degraded Forests

(1) Eco-Restoration Models

In the DPR, the following activities are proposed under the rehabilitation of degraded forests:

1. Protection of the selected areas from grazing, fire and other human activities, which are main causes of degradation of these areas.
2. Soil and moisture conservation measures, like construction of check dams, gully plugging, training of streams, digging of contour furrows along with seed sowing before silvicultural operations/ under planting/ block plantations.
3. Silvicultural operations like singling, pruning and tending of already present rootstock to augment in-situ tree growth.
4. Artificial regeneration through afforestation activities in areas, which are blanks and poorly stocked.
5. Establishment of community managed nurseries in the VP areas and strengthening of departmental nurseries for supply of quality seedlings.

The DPR suggests three Eco-Restoration (ER) Models to undertake above, as summarized in the table below:

Table 6.5.1 Proposed Three Eco-Restoration Models

Type of Work	ER Model I	ER Model II	ER Model III
Work Quantity	Approximately 30,000 ha (60% of intervention area)	Approximately 10,000 ha (20% of intervention area)	Approximately 10,000 ha (20% of intervention area)
Preparatory Works	Survey of the area & weed removal		
Protection Works	Display board and the construction of protection walls by using rough stone dry packing in all around the area and		
SMC works	<ol style="list-style-type: none"> 1. Check dams (Dry stone, Rock fill with gabion structures, Random Rabble stone masonry etc. with vegetation in upstream and downstream) 2. Staggered Contour trenches 3. Furrows 4. Gully plugging works 5. Seed sowing along the bund of the contour trenches/furrows 		
Silvicultural Operations	<ol style="list-style-type: none"> 1. Singling, pruning, tending of the available root stock 	<ol style="list-style-type: none"> 1. Singling, pruning, tending of the available root stock 2. Plantation @ 500 plants/ ha. (under planting) 	<ol style="list-style-type: none"> 1. Singling, pruning, tending of the available root stock 2. Plantation @ 1,000 plants/ ha. (in sizable blanks)
Maintenance	Watch and ward for 3 years, creation of inspection path and documentation work		

Source: JICA Preparatory Survey Team based on DPR

It should be noted that the 30,000 ha, 10,000 ha and 10,000 ha for Model I, II and III respectively are indicative. This ratio was derived from the ratio of Moderately Dense Forest (approximately 54%) and Open and Scrub Forest (approximately 34%) within the total forests in the 37 target ranges. During implementation of these ER models, a proper survey and planning procedure should be adopted for each intervention sites to customize the model.

The selection criteria for each model are summarized in the table below:

Table 6.5.2 Selection Criteria for ER Model

Model	Criteria
Model I	<ul style="list-style-type: none"> - Partially degraded - The average crown density of a forest patch is between 40% and 70% - Remaining root stock is sufficient for natural regeneration - Species that are present in the forest patch are adequate, which does not require manipulation by plantation
Model II	<ul style="list-style-type: none"> - Degraded - The average crown density of a forest patch is between 10% and 40% - Remaining root stock is sufficient for natural regeneration with gap planting
Model III	<ul style="list-style-type: none"> - Degraded - The average crown density of a forest patch is below 40% - Remaining root stock is insufficient for natural regeneration, which requires block plantation

Source: JICA Preparatory Survey Team

Ten steps for the rehabilitation of degraded forests are proposed in the DPR, and the JICA Survey Team suggests the process of implementation of these models as mentioned below;

- a. Preparation of survey and demarcation of area with GPS location boundary in a big map.
- b. In the map, indication of the length of stone wall required from protection from fire and grazing.
- c. Describe the site's history and map it where possible. Use existing/available data– working plan – management maps, satellite images/aerial photographs, original land survey records and maps produced from them, historical descriptions, oral histories, logging records, fire history/maps, etc.

- d. Develop a hypothesis about factors of degradation and how the original system worked. Review technical literature for related ecological studies conducted in the region; status of nearby natural (not degraded) areas.
- e. Develop goals for the site by assessing the potential for restoration with reasonable effort, and specifying its desired future condition.
- f. Develop a conceptual implementation plan to accomplish the goals. Identify and schedule tasks, specify methods, estimate material costs and labor etc. for each intervention/activity.
- g. Identification of the location and measurement of Soil and Moisture conservation activities in the map along with the length or series of gully control structures necessary in the particular area.
- h. Calculation of the contour furrows or contour trenches along with the size and total length required for the area.
- i. Indication of the inspection path covering the entire area in the map.
- j. Mapping of the size, location and number of percolation tanks in the survey map
- k. Preparation of a micro plan by incorporating all above information and plans.
- l. Recording of works undertaken, including the indication of certified seeds and seedlings of species with the quantity required for the particular patch mentioned in the note.
- m. Maintain a Plantation Journal that should include the information regarding the timing & period when various activities/works carried out in the particular intervention area. It should also include the source of seed for seed sown and also seedlings used for plantation & source of seed, by which seedlings would be raised.

Documentation of pre-during-post photographs of the activities needs to be kept in the file for transparency and dissemination of those to other Van Panchayats (VPs). A detail field level workshop needs to be conducted during the micro planning in a cluster approach to preparing the basic information and converted into a proposal by the VP members. Forest department staff will provide the necessary technical inputs for preparing the note and micro plan/ proposal for the target patches, according to the site conditions and GPS traverse with the readings of the ER model area. The cost estimate of each and every site is different according to the local specific site conditions.

In the context of a hilly state as Uttarakhand, it is strongly suggested that soil reclamation/conservation measures should form the core of the centre to eco-restoration interventions. For hills, this approach is the harbinger for restoration of degraded forests, where steep slopes make the area vulnerable to erosion consequently degrading the tree cover. Without proper soil and water conservation and adequate tree cover, rainwater falling on the slopes does not percolate deep down into the soil and the land gets further eroded. Therefore, a combination of both soil and moisture conservation and plantation works was proposed for UFRMP under all three Eco-restoration Models, which is technically appropriate.


Soil and moisture conservation measures as gully plugging, contour bunding, staggered contour trench with seed sowing measures, saucer pits with trench ridge /trench mound etc. would be taken up as per site requirement. Gully plugging work would consist of:

- a. gully head protection work to prevent further development of the gully head; and
- b. a series of check dams to moderate slopes of the gully and eventually to mitigate scouring from the gully slopes.

For implementing the soil and moisture control works in the area while looking into the local construction materials available to reduce the cost and easy maintenance by the community. The Forest department personnel can provide technical assistance to the VP for identifying the technology and help them preparing the models.


The recommended elements of three eco-restoration models are described below:

1) Display board

Item	Specification	
Nature	Permanent	
Numbers	Two (one for general information, one for technical details)	
Materials used	Iron frames with colours	
Size of the display board	a. 1.0 m x 0.5 m for general information b. 1.0 m x 2.0 m for technical information	
Location	Any side of the boundary of the plantation area, preferably on the road side to have greater transparency	
Information to be displayed	1) Plantation area, 2) Name of the Species, 3) Year of start, 4) Project cost, 5) Funded by, 6) Implemented by, 7) Managed by, 8) Name of the VP, etc. Eco-restoration model name etc. to be mentioned there for display, 9) Technical information (no. of pits, size, no. of plants, gully control structures/ furrows, percolation tank numbers and its size, pruning and singling numbers and times, inspection path, seed sowing, etc.)	


Location: Alaknanda Soil Conservation division (sample of "a" type) (22 Sep 2013)
Source: JICA Preparatory Survey Team

2) Protection wall


Item	Specification	
Nature	Semi-permanent	
Length	Approximately 111 metres per hectare	
Material	Locally available Random Rubble Stone	
Size	Bottom – 1.0 m, Top – 0.7 m, Height – 1.20 m	
Location	Boundary of the plantation area to protect from grazing and fire	
Process	Rough stone dry packing one after another with overlapping and prepare the wall in the boundary line.	

Location: Ranikhet Soil Conservation division, Uttarakhand (20 Aug. 2013)
Source: JICA Preparatory Survey Team



3) Check dams/ Gully plugging works

Item	Specification	
Nature	Semi-permanent/ Permanent	
Volume	Approximately 120 cubic meters for 10 hectares	
Material	Locally available Random Rubble Stone, cement, sand, GI wires	
Size	Varies from place to place and design, drawing and estimation needs to be prepared	
Location	Generally need to be built in the gullies to check erosion	
Process	Identification of site, layout map, earthwork in excavation, foundation	

Location: Ranikhet Soil Conservation Division (20 Aug. 2013)
Source: JICA Preparatory Survey Team

	work, superstructure work with RR stone masonry or rough stone dry packing in 3mm minimum GI wire. A series of gully control structures can be built in a gully.	 <p><i>Location: Alaknanda Soil Conservation division (22 Sep. 2013) Source: JICA Preparatory Survey Team</i></p>
--	--	---

4) Staggered contour trenches/ Furrows:

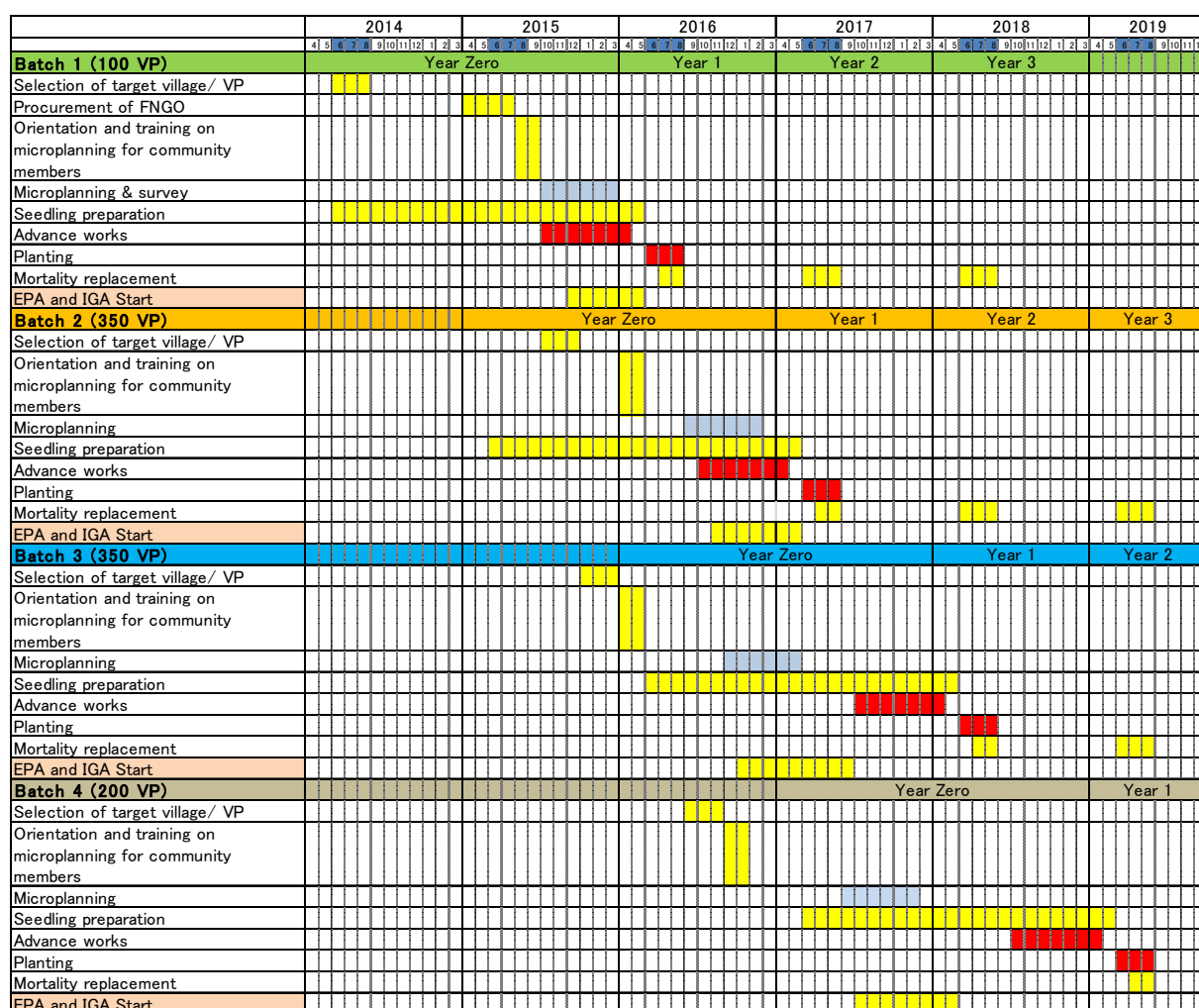
Item	Specification	 <p><i>Location: Alaknand Soil Conservation Division (22 Sep. 2013) Source: JICA Preparatory Survey Team</i></p>  <p><i>Location: Alaknanda Soil Conservation division (22 Sep. 2013) Source: JICA Preparatory Survey Team</i></p>
Nature	Semi-permanent	
Number of trenches	1,000 numbers in 10 hectares	
Size	3.0 m x 0.3 m x 0.3 m 1,000 x 3.0 = 3,000 running metres or less, according to the site condition but the length of one set should be not less than 1,000 running metres	
Location	Digging of earth by staggered contour trenches within the demarcated land	
Process	Identification of site, layout map, earthwork in excavation. Sowing of seeds in the excavated earth from the contour trenches or furrows to be sowed above the surface.	

6) Silvicultural operations

Item	Specification
Nature	Labor work
Frequency	Two times in a year for 3-4 years
Process	a. Other works: Singling, pruning, tending of the available root stock needs to be done

Item	Specification
Protection works	<p>b. Watch and ward: For 2 years and 8 months, a group of watchers from the village is required for each intervention site. They are responsible for the protection of plantation from grazing, fire, periodical maintenance of walls and replanting.</p> <p>c. Inspection path: Inspection paths (generally 60 cm width) should be laid in the plantation site cross-crossing the area for inspection and checking. These paths may also form the boundary for the check-plots.</p> <p>d. Watch and Ward: It is estimated that one watcher can patrol 10 ha. The project provides 0.1 watcher per ha for the entire forest rehabilitation areas for 8 months during the first year and 12 months during the second and third years. The maintenance of fencing and mortality replacement are responsible for the VP/ Watchers, and the cost necessary is included in the cost for the engagement of watchers.</p>

The JICA Survey Team recommends that the Eco-Restoration works will be carried out by approximately **1,000 VP** within the prioritized target ranges in **four batches** under the project, and 100, 350, 350, 200 VPs should be taken up in the 1st, 2nd, 3rd and 4th batch respectively. The general schedule of works at the community level is indicated in the chart below:



Source: JICA Preparatory Survey Team

Figure 6.5.2 Overall Work Schedule of a Community (Batch-Wise)

It is important to note also that indigenous species are suggested by the JICA Survey Team to be planted and regenerated under the UFRMP. VPs under the project will make sure that the biodiversity aspects are taken care of in their plantation areas.

7) Nursery Operations

a) Arrangement of Seeds and Seedlings

It should be noted that the raising seedlings for the NTFP species and other forest species in the hilly areas will take average two to three years in general. If the planting work would take place in 2016, the planting materials should be prepared starting from 2014. As the micro plans would not yet have been prepared before the nursery operations start, the seedlings should be prepared by the UKFD or in the existing decentralized nurseries.

b) Selection of Species

It is important to note that the selection of species to be planted under Model II and III will be decided during the micro planning by the community people themselves. However, the field forest officials should undertake rapid assessment of seedling demand of VP for selecting the species to be raised in the nursery of UKFD before the micro planning because it will take at least 2 years to have appropriate sizes of planting materials in the hills. When the required planting materials are not available in the nursery after the species are identified during the micro planning, the seedlings may be procured from the private nurseries, or a part of plantation may be taken up in the following years.

c) Sources of Seeds and Seedlings

For the 30,000ha of ER Model I, about 200,000 kg of sowing and for the 10,000 ha of ER Model II work and another 10,000 ha of ER Model III work, approximately 15 million seedlings plus seedlings for mortality replanting (approximately 10%) are required in four batches. During implementation of forest rehabilitation, certified seeds should be purchased from the certified stores, however, if seeds of some species are not available in the certified seed stores, the same could be arranged by the concerned FMU with the recorded source of seeds. The certified seeds should be collected with certificate mentioning the area of collection, date of collection and germination percent. Seed Centres have been established at Ranikhet and Gauchar for seed processing, storage, testing, certification, packaging and information dissemination for the buyers. The VP members can purchase the seeds from recognized certified seed store for better results in the hilly regions.

To secure the 15 plus million seedlings in four batches, the VP members should purchase the seedlings from existing decentralized/ *Mahila nursery* (women's nurseries) in nearby localities. If the nurseries are not available locally, they can purchase from nearest available, possibly the nurseries of UKFD, or private owned nurseries. If the VP is capable of establishing a new nursery of their own, the project would support such venture after a careful assessment of feasibility based on the availability of adequate land, water source, accessibility, labor availability and technical capability of VP members.

d) Requirement of Plants

The batch-wise requirement of plants and seed (for sowing only) is summarized in the Table below. For Batch 1, 2, 3 and 4 ER Models approximately 1.65 million, 5.775 million, 5.775 million and 3.300 mill seedlings/plants will be required respectively for plantations under ER Mode II & III. For sowing seed, approximately 20,000 kg; 70,000 kg; 70,000 kg & 20,000 kg of seeds will be required for Batch 1 to 4 respectively under all the three ER Models.

Table 6.5.3 Estimated Requirement of Seedlings and Seeds

Batches	Category	ER Models	No. of Hectares	Plants requirement (Numbers)	Requirement of Seeds for sowing (Kgs.)
Batch-1 (100 VPs)	60%	ERM-I	3,000	-	12,000
	20%	ERM-II	1,000	550,000	4,000
	20%	ERM-III	1,000	1,100,000	4,000
Total of Batch-1			5,000	1,650,000	20,000
Batch-2 (350 VPs)	60%	ERM-I	10,500	-	42,000
	20%	ERM-II	3,500	1,925,000	14,000

Batches	Category	ER Models	No. of Hectares	Plants requirement (Numbers)	Requirement of Seeds for sowing (Kgs.)
	20%	ERM-III	3,500	3,850,000	14,000
Total of Batch-2			17,500	5,775,000	70,000
Batch-3 (350 VPs)	60%	ERM-I	10,500	-	42,000
	20%	ERM-II	3,500	1,925,000	14,000
	20%	ERM-III	3,500	3,850,000	14,000
Total of Batch-3			17,500	5,775,000	70,000
Batch-4 (200 VPs)	60%	ERM-I	6,000	-	24,000
	20%	ERM-II	2,000	1,100,000	8,000
	20%	ERM-III	2,000	2,200,000	8,000
Total of Batch-4			10,000	3,300,000	40,000
Grand Total			50,000	16,500,000	200,000

Note:

For ERM-II, 500 plants per hectare + 10% mortality has been calculated.

For ERM-III, 1000 plants per hectare + 10% mortality has been calculated.

For all ER Models, @ 4 kgs seeds for sowing per hectare has been calculated

Source: JICA Preparatory Survey Team

e) Existing Nurseries

The UKFD has about 436 nurseries comprising about 333 ha area in the Hill region of Uttarakhand. However, it will be convenient and economical to arrange seedlings from the nurseries located within the Target Ranges of the project. Details on existing nurseries in the Target Ranges of the Target divisions and their annual production capacity has been given in the Table below. Within the 37 Target Ranges there are 123 existing nurseries of the UKFD comprising about 86.62 ha area which may produce approximately 7.0 million seedlings annually against maximum annual requirements of 5.8 million seedling for Batch 2 & 3 in the respective years.

Table 6.5.4 Summary of the Existing Nurseries in the Priority Ranges and Estimated Production Capacity of Seedlings

Divisions	Ranges	No of Nurseries in the Priority Range	Area(ha)	Annual capacity (No. of plants)*
Alaknanda SC	Aser Simalli	5	3.74	299.2
	Attagarh	4	2.55	204
	Tharali	4	4	320
Total of the Division		13	10.29	823.2
Almora C & S	Gananath	4	3.3	264
	Jageshwar	1	0.5	40
	Kosi	1	2	160
Total of the Division		6	5.8	464
Nainital SC	Mukteshwar	5	4.75	380
	Okhalkanda	3	4.7	376
	Ramgarh	6	4.25	340
Total of the Division		14	13.7	1,096.00
Pauri C & S	Pabo	6	1.94	155.2
	Pauri	5	1.48	118.4
	Satpuli	3	1.94	155.2

Divisions	Ranges	No of Nurseries in the Priority Range	Area(ha)	Annual capacity (No. of plants)*
Total of the Division		14	5.36	428.8
Lansdon SC	Chousain	1	0.3	24
	Jaiharikhal	1	1.5	120
	Matiyali	1	1	80
Total of the Division		3	2.8	224
Ramnagar SC	Ringlana	5	2.95	236
	Nainidada	(14 small nurseries)	1.35	108
	Dhumakot	6	3.55	284
Total of the Division		11 +14 small nurseries	7.85	628
Ranikhet SC	Gagas	3	0.4	32
	Gairsen	3	1	80
	Chantharia	2	2.75	220
Total of the Division		8	4.15	332
Tehri Dam I	Dharkot	3	2.2	176
	Nailchami	1	1	80
Total of the Division		4	3.2	256
Bageshwar	Kapkot	5	2.45	196
	Dharmghar	3	0.95	76
	Bashwar	3	3.05	244
Total of the Division		11	6.45	516
Campawat	Lohaghat	1	2	160
	Bhingrara	4	4.4	192
	Devidhura	2	1	80
Total of the Division		7	5.4	432
Narendra Nagar	Manikanth	2	0.7	56
	Shivpuri	4	4.15	332
	Saklana (Chamba)	3	0.87	69.6
Total of the Division		9	5.72	457.6
Pithoragarh	Pithoragarh	6	4.6	368
	Gangolihat	6	3.7	296
	Didihat	8	5.6	448
Total of Division		20	13.9	1,272.00
Mussoorie	Mussoorie	1	1.5	120
	Raipur	1	0.5	40
Total of the Division		2	2	160
Total of the State for Target Ranges		-	86.62	7,089.60

*Number of plants which could be produced annually is estimated on the basis that about 80,000 plants of >2yrs age could be raised per hectare annually (as communicated by the field officers of UKFD).

Note: In addition to above nurseries, in the Hill region of Uttarakhand, there are 12 Research Nurseries comprising 22.50 ha area which may be used to produce plants for NTFP plantation under UFRMP.

Source: Compiled by JICA Survey Team based on the data provided by UKFD

f) Seed Sources

Identified seed sources maintained by the Research Organization of UKFD has been summarized in the Table below. These include 222 seed sources (185 Seed Plots+ 19 Seed Stands + 18 Seed Production Areas) with 800.66 ha area bearing 32,497 trees which could be used as source for supply of certified seeds for the project activities. In addition to this there are 32 Seedling Seed Production Areas (SSPAs) over 48.5 ha area comprising 3292 trees maintained by the Research Organization, however, as these SSPs were established during the period 1994 onwards, they may not be old enough to produce viable seed at present.

There are 16 Vegetative Multiplication Gardens/Clonal Multiplication Areas (VMGs/CMAs) of *Taxus baccata* cover 7.00 ha area comprising 52700 plants also maintained by the Research organization, from which about 500,000 cuttings can be collected to prepare about 300,000 clonal plants of *T. baccata* annually for the project activities.

Table 6.5.5 Identified Seed Sources of various species in the Hill Region of Uttarakhand

Species(Scientific name)	Species (local name)	No of seed sources	Area of seed sources (ha)	No of trees
<i>Cedrus deodara</i>	Deodar	20.00	53.14	1,561.00
<i>Qupressus torulosa</i>	Surai	9.00	30.00	1,219.00
<i>Fraxinus micrantha</i>	Angu	6.00	22.80	424.00
<i>Quercus floribunda</i>	Tilonj	7.00	13.00	199.00
<i>Quercus leucotrichofoa</i>	Banj	5.00	26.50	866.00
<i>Pinus wallichiana</i>	Kail	9.00	27.57	1,634.00
<i>Alnus nepalensis</i>	Utis	5.00	13.50	225.00
<i>Juglens regia</i>	Akharot	9.00	33.20	1,151.00
<i>Populus ciliate</i>	Pahari Pipal/Siyan	6.00	33.50	984.00
<i>C. deodara, P. wallichiana & Q. torulosa mixed</i>	Deeodar-Kail-Surai mishrit	16.00	67.00	833.00
<i>Oak, Rhododendron, Alnus etc mixed</i>	Banj-Burans-utis mishrit	8.00	19.00	254.00
<i>Pinus roxburghii</i>	Chir	60.00	318.43	15,613.00
<i>Other species</i>		62.00	143.02	7,534.00
Total		222.00	800.66	32,497.00

*Identified Seed Sources include 185 Seed Plots (557.46 ha), 19 Seed Stands (87.7 ha) and 18 Seed Production Areas (155.5 ha) all maintained by Research Organization of UKFD.

Note: 1. In addition to above seed sources 32 Seedling Seed Production Areas (SSPAs) comprising 48.5 ha area with 3292 trees are also maintained by the Research Organization, however, as these were established during the period 1994 onwards, therefore may not be old enough to bear viable seed at present.

Note: 2: There are 16 Vegetative Multiplication Gardens/Areas (7.00 ha) of *Taxus baccata* comprising 52700 plants which can produce about 500,000 cuttings to raise about 300,000 clonal plants of *Taxus baccata* annually.

Source: Compiled from Annual Report: 2011-12, Uttarakhand Forest Research Organization, Haldwani.

h) Seed Procurement

The VPs will place species wise demand of seedlings (three years in advance of the year of plantation) and seeds for direct sowing under all ER Models (one year in advance of the year of sowing) to the concerning Range Office (FMU). The FMU will consolidate the demand of seeds of all VPs and will place the indent of seed to the concerning seed store/s or

Silviculturist Hill Region, Nainital directly or through the concerning DMU. The Silviculturist Hill Region will assure to supply the certified seed to the concerning DMU/FMU timely. However, if the Silviculturist is not able to supply seeds of some specific species, the concerning FMU may collect seeds locally maintain the identity of the seed sources.

8) Development of Modern Nurseries

In each target division, a nursery with a set of modern facilities will be developed under the project. There may be already some nurseries in almost all the divisions with poly houses and shade houses, but may not be equipped with mist chambers, which is required mainly when clonal plants are to be raised. As power supply position is poor at most of the places, maintaining a generator may be costly. Therefore UKFD may first assess the infrastructure already available in the divisions regarding modern nursery and some of the divisions may only need up-gradation of the nurseries.

A brief description of specifications and key infrastructure required is shown below for a modern nursery to be established in hill areas of Uttarakhand:

- a. Location: Hill areas within the 13 target divisions
- b. Size: Approximately 2.00 ha per nursery, with site development and protection devices
- c. Production Capacity: 250,000 seedlings per year (100,000 clonal plants through root trainers, 100,000 seed origin seedlings through root trainer, 50,000 poly bags/poly vinyl bags with over 1.0 m heights for avenue plantation, urban area plantation, etc.). This estimate indicates that the area of the nursery and infrastructure in the nursery should be such that, it could hold and maintain about 850,000 plants at one time for sustained supply of 250,000 plants annually.
- d. Two mist chambers (each 90-100 m² plinth area) and 2 shade houses (each 90-100 m² plinth area)
- e. 720,000 root trainers of 200-250 cc capacity
- f. A number of root trainer stands, racks, trays and various nursery equipment as per requirements
- g. 275,000 large size (say 30 cm x 45 cm) poly bags or other bags
- h. Two compost chamber/vermin compost units
- i. Irrigation facilities with modern devices, water storage, pump house, ionizer
- j. Working shade (about 200 m² plinth area)
- k. Stores for seeds, equipment, composts, etc.
- l. Office room, record room, conference room, visitor's room
- m. Space for raising Clonal Multiplication Area (CMA)/ vegetative garden/s
- n. Soil testing lab for testing physical and chemical properties of the potting media to be used for filling root trainers and bags
- o. Generator for backup Power supply.

9) Wage Rate

During the preparation of DPR in May 2013, the basis of cost calculation was INR 100 wage rate per day as per UKFD's Schedule of Rate, although the minimum wage at that time was already increased to INR 203 vide Notification NO. 364/ VIII/ 13-228 (Labor)/ 2001, Dehradun dated 6th March 2013 issued by Uttarakhand Labor and Employment Department. For unknown reasons, UKFD's Schedule of Rate was not revised at the time of DPR finalization (May 2013) despite of wage hike in March 2013.

The costing of each model is separately calculated and needs to be recalculated according to the new wage rate. During the JICA Preparatory Survey, UKFD's Schedule of Rate was still INR 100 per day. However, it was decided to adopt INR 203 per day after a series of discussions with concerned authorities. Therefore, the project cost was calculated at the rate of INR 203 per day for unskilled laborers (**Chapter 11**).

6.5.5 NTFP Plantation

The DPR indicates to undertake NTFP plantation of 500 ha in the Reserved Forests mainly by UKFD. Preliminary identification of species for plantation under the Project has been done with the objective of increasing the resource base of NTFPs within the forests while at the same time augmenting local incomes through the sale of NTFPs. The basic purpose of having these plantations is to establish demonstration models for sustainable management – appropriate mechanisms for protection, timely execution of silvicultural activities, enhancing the production, sustainable harvesting, primary value addition and also to ensure assured supply to processing industries. VPs and SHGs willing to carry out plantation or cultivation of these species shall be brought to these sites for training. These sites shall be located in different ecological zones so that the local VPs and SHGs can easily come to these sites for exposure. These sites shall also serve the purpose of silvicultural research of these species in different ecological zones.

However, species for plantation within the Reserve Forests are recommended considering the existing legal mechanisms that regulate/restrict harvest of NTFPs from Reserve forests, existing resource base of NTFPs within the forest areas and also the opportunity in the market. Plantation of herbs is not allowed in the forests as per the prevailing conservation acts and rules so emphasis was given on the plantation of tree species, unless the policy initiatives are taken as suggested in **Section 6.5.1**. The NTFPs harvested from these trees will be leaves, fruits and seeds. The harvesting of produce will start from the 6th year of plantation and in some case it would start from 8th year.

A list of species for plantation suggested by the Forest Officials in a meeting in Haldwani has been provided in **Attachment 6.5.1**. On the basis of the list further discussions were held with Forest Department and it was decided that six species shall be prioritized for NTFP plantation. These species have been given below. The current demand in the market was also taken into consideration while selecting the species.

Table 6.5.6 Plantation of NTFP Species

Target Area	NTFPs to be planted	Remark
Reserve Forest (NTFP Plantation – 500 ha)	Reetha (<i>Sapindus mukorossi</i>), Timur (<i>Zanthoxylum armatum</i>), Thuner (<i>Taxus baccata</i>), Kaphal (<i>Myrica esculenta/nagi</i>), Tejpatta (<i>Cinnamomum tamala</i>), Kedarpati (<i>Skimmia laureola</i>)	Plantation may be carried out in 20-30 sites selected from the target Forest Divisions. These sites would function as demonstration models for NTFP plantations, and one site should be at least 10 ha or more.
Forest areas of VPs (Eco restoration model III)	Reetha (<i>Sapindus mukorossi</i>), Timur (<i>Zanthoxylum armatum</i>), Thuner (<i>Taxus baccata</i>), Kaphal (<i>Myrica esculenta/nagi</i>), Tejpatta (<i>Cinnamomum tamala</i>) and Kedarpati (<i>Skimmia laureola</i>), and any other species suggested by the VP during the micro plan preparation.	NTFPs can be planted under provisions of the eco-restoration model. During the process of micro planning a species selection matrix shall be prepared through participatory exercises. Some species shall be planted in the VP forests based on the selection by VP considering the demand in the market.

Target Area	NTFPs to be planted	Remark
Outside the forests	<p><u>In low to mid altitude areas:</u> Kalajeera (<i>Carom carvi/ Bunium persicum</i>), Rose (<i>Rosa spp.</i>), Large Cardamom (<i>Amomum subulatum</i>)</p> <p><u>In low altitude areas:</u> Satavar (<i>Asparagus racemosus</i>), Chamomilla (<i>Matricharia chamomilla</i>), Lemon grass (<i>Cymbopogon citratus</i>), Ashwaganda and Pipli (<i>Piper longum</i>)</p>	This may be carried out as part of IGA and sourcing funds from other schemes. Possibilities would be explored for sourcing funds from MGNREGS, NHM and Department of Horticulture (cultivation of MAP). Some SHGs may also be linked with financial institutions to undertake cultivation of NTFP/ MAP.

Source: JICA Preparatory Survey Team

Criteria for selection of sites for NTFP Plantation (500 ha)

About 20 to 30 sites (1-3 sites per target divisions) in the Reserve Forests shall be selected to especially plant and sustainably manage NTFP species. The following key criteria shall be followed to select the sites:

- Sites shall be identified from each ecological zone – sub tropical to sub alpine zones – elevation shall be a criterion to select the sites.
- Minimum unit/ size of plantation is 10 ha.
- Average 2 model sites will be selected from each target division
- Proximity to VP – sites within a distance of 1-5 kms from the VP shall be identified for NTFP plantation. This would help in proper protection and maintenance of the sites.
- Accessibility to the site should be looked into while selecting a site. This would help to use the site as a demonstration model. Once production of NTFP starts it would become easy for transportation of the produce to the market/ processing industries
- Steep slopes and highly denuded areas shall not be identified.

For undertaking NTFP plantation the model cost estimate of the Forest Department for Eco Restoration has been taken as the standard. There is an enhancement of cost for the planting materials as well as for maintenance. The planting material cost has been taken as INR 15 per plant as per the discussion with Research wing of the Forest Department. As against 3- year maintenance of the eco restoration sites the NTFP plantations shall be maintained for 4 years after planting. The cost estimate includes provisions for adequate soil and moisture conservation measures. Once the sites are identified detailed site specific cost estimates shall be prepared by the Project with reference to the model estimates.

NTFP plantation shall also be carried out in non RF areas i.e. in VP forests. Especially in the eco restoration model III priority shall be given for inclusion of NTFP species in the plantation. The same species suggested for NTFP plantation may also be given priority but most importantly the choice of VP shall be the deciding factor. The VPs shall be informed and educated on the demands of different NTFPs in the market, legal provisions, cost-benefit analysis of plantation of different species etc., which would definitely help them in selection of NTFP species to be planted in VP forests.

The DPR has recommended plantation and natural regeneration of two species in the project areas, of which harvesting of NTFP is prohibited from the forest land. However, this requires the amendment of policy that would allow the harvesting of such NTFPs within the project area. Since the leaves and fruits are required for IGAs, the environmental impact of harvesting such banned species is deemed negligible. Thus, the policy change to allow the project to harvest such NTFPs within the project area will be proposed.

The Project shall also promote cultivation of medicinal and aromatic plants in private lands through SHGs. Cluster development approach shall be adopted for cultivation, value addition and marketing of MAPs. NCE shall assist the FNGO to mobilize the community and build their capacity to undertake cultivation. SHG Federation shall be supported financially and technically to assist the SHGs to

undertake cultivation in small areas (0.04 ha per member) as a startup activity. Thereafter the SHGs and SHG Federation have to access funds from financial institutions and other schemes to carry out cultivation. NCE shall establish the linkages and provide all necessary capacity building, technical and market support.

6.5.6 Biodiversity Conservation and Wildlife Management

(1) Biodiversity Conservation

In **Section 6.3**, the Overall Goal and basic approach was discussed, and it was decided that the followings will be focused under the proposed UFRMP for biodiversity conservation:

Table 6.5.7 Key Activities for Biodiversity Conservation

	Focus	Key Target and Activity	Remark
1	Sacred groves	<ul style="list-style-type: none"> - 13 important sacred groves - Survey of targeted sacred groves, including delimitation, status of land ownership, detailing a socio-economic profile of the stakeholders, resource use pattern in the local communities, various components of biodiversity, their socio-cultural values, customs, taboos & customary laws, etc. - Formation of Gram Panchayat-level BMCs (if there is no existing BMC) - Preparation of PBRs - Registration of sacred groves as Biodiversity Heritage Sites under Section 37 of the Biological Diversity Act, 2002 	<ul style="list-style-type: none"> - One sacred grove from each target division may be selected. - Sacred groves within existing VP under the project should be prioritized.
2	Strengthening of village-level institutions, i.e., BMC	<ul style="list-style-type: none"> - 13 BMCs will be trained by specialized agencies as Wildlife Institute of India (WII), State Biodiversity Board (SBB), UKFD, universities, etc. - Technical and handholding support at the field level will be ensured by engaging Field Coordinator (senior and junior research scholars with natural science background) - Awareness about biodiversity, related Act & Rules, their importance, procedure for constitution of BMCs and authority & responsibility of BMCs 	<ul style="list-style-type: none"> - SBB has its Technical Support Group, and the project should coordinate with it through SBB
3	Documentation and Publications	<ul style="list-style-type: none"> - Publication and distribution of educational & extension material, pamphlets & leaflets - Organizing field visits, awareness campaigns and exhibitions - Video documentation and photographs - Translation of extension material in to local vernacular 	<ul style="list-style-type: none"> - Counterpart fund may be allocated by the state government for this.

Source: JICA Preparatory Survey Team

It is also important to note that the central focus of the project should be the strengthening of village-level institutions, i.e., BMC which will implement the management of sacred groves and preparation of PBRs. Certain activities may be implemented departmentally wherever no residents are available nearby, but such initiatives should be avoided if possible and appropriate

It is important to note that the biodiversity conservation is not just conserving specific small areas as sacred groves. The entire intervention areas under the project must address the issue of biodiversity, and the plantation models and species have been selected in due considerations to biodiversity. It is important to note also that indigenous species are suggested by the JICA Survey Team to be planted and regenerated under the UFRMP. VPs (VPs) under the project will make sure that the biodiversity

aspects are taken care in their plantation areas and implement the mitigation measures for human and animal conflict.

Sacred groves often represent a positive interface between nature, culture and society. Declaring such areas as Biodiversity Heritage Site (BHS) should not only be a matter of pride to the local communities but should also contribute to the objectives of both conservation and livelihood security. Thus, the primary project objective is to facilitate the notification of the selected sacred groves as Biodiversity Heritage Sites. Without imposing no additional access/use restrictions and that a detailed process of consultation is undertaken following the BHS guidelines, ensuring free, prior and informed consultation, broad community support and active participation of local people in Protected Area registration.

The preliminary survey/assessment of the sacred groves will include the activities like: precise delimitation of the sacred groves in terms of location, area covered and status of land ownership; detailing a socio-economic profile of the stakeholders, the community hierarchy, resource use pattern and gender distribution in the local communities; assessment and inventorization of the local floral and faunal diversity; assessment of the local culture, customs, taboos and customary laws with respect to the sacred groves, and their relevance vis-à-vis conservation of biodiversity; assessment of the resource exploitation pattern – including the species that are exploited and their quantification, as well as the extent of anthropogenic pressure; and conducting meetings with the local resource persons and village councils to discuss the viability of establishment of biodiversity heritage sites and its implications.

For the capacity building of BMCs and preparation of PBRs and other conservation activities, it is suggested that the project activities should be segregated to avoid conflict between the two different village-level organizations. In this project, it has been proposed that concerning to each sacred grove, one BMC should be constituted at Gram Panchayat/ Gram Sabha level to associate them with the various activities related to sacred groves also, while the field level activities may be carried out by the members of VP. Therefore there will be 13 BMCs to be constituted under this project. One of the most important responsibilities of the BMCs is to prepare PBR for their respective jurisdiction.

The preparation of PBR is a participatory process requiring intensive and extensive consultation involving the active support and cooperation of a large number of people. One of the first steps for preparing a PBR is to organize a group meeting in the presence of all sections of people in the Panchayat, members of the BMC, students, knowledgeable individuals and all those interested in the effort to explain the objectives and purpose of the exercise. Different social groups in the village need to be identified for purpose of data collection. Documentation of Traditional knowledge of individuals with regard to biodiversity and its uses is an important part of PBR. The process in PBR Preparation is summarized as under:

- ✓ Step 1: Formation of BMC
- ✓ Step 2: Sensitization of the public about the study, survey and possible management
- ✓ Step 3: Training of members in identification and collection of data on biological resources and traditional knowledge
- ✓ Step 4: Collection of data. Data collections includes review of literature on the natural resources of the districts, Participatory Rural Appraisal (PRAs) at village level, household interviews, individual interviews with village leaders and knowledgeable individuals, household heads, key actors of the Panchayat Raj institutions and NGOs and direct field observations
- ✓ Step 5: Analysis and validation of data in consultation with technical support group and BMC
- ✓ Step 6: Computerization of information and resources

Information provided by people needs to be collated, analyzed and crosschecked by the members of the Technical Support Group (TSG) before documentation. The PBR is an important base document in the legal arena as evidence of prior knowledge and hence careful documentation is necessary. The

documentation process includes information gathered from individuals through detailed questionnaire, focused group discussion with persons having knowledge and published secondary information.

Documentation also includes photographs (including digital images), drawings, audio and video recordings and other records like printed material. The document (PBR) should be endorsed by the BMC and then publicized in the Gram Sabha / Gram Panchayat / Panchayat Samiti. The document can be a useful tool in the management and sustainable use of bio-resources. The document can also be a useful teaching tool for teaching environmental studies at schools, colleges and Universities. It is also suggested that the PBR should be periodically updated with additional and new information as and when.

To complete all above technically-demanding project components on biodiversity conservation successfully, a TSG should be strengthened through intensive capacity building inputs from the project.

(2) Wildlife Management: Addressing the Issue of Human and Wildlife Conflict

The issues of human and wildlife conflict is immense as discussed in the previous chapters, ranging from the loss of lives by large mammals to the damages on the agricultural productions at farmlands by wild bores and monkeys. Each issue is different in nature, and locations of such conflicts are disperse and specific. One project cannot address all the issues of human and wildlife conflict, and the interventions under the JICA project are needed to establish a focus.

As the project as a whole will be implemented through a participatory mode, the capacity building of communities and their village level institutions, such as VP to address the issue of human and wildlife conflict was deemed appropriate. The project would focus on the development of community's capacity to deal with the emergency situations of contact between the human and wildlife in their villages, which are life-threatening, and professional support system to the communities to handle the emergency situation needs to be developed as well. For this, the project will focus largely the following two activities: 1) Formation and operation of Wildlife Primary Reaction Team (PRT) at the community level, and 2) Formation and operation of Wildlife Quick Response Team (QRT).

1) Identification of Hot Spot for Human and Wildlife Conflicts

Based on the existing record of human and wildlife conflict incidents and field interview survey by the project staff at the initial stage of the project, the project should identify the "hot spots" where the occurrence of such conflicts is high. There are a number of different kinds of human and wildlife conflict, and the project should focus on the life-threatening conflicts, such as the conflict with Elephants, Tigers, Leopards and other large mammals. UKFD may not have such data and information in a compiled format, so field data collection and interviews, as well as field visits, if deemed necessary, should be carried out.

After such survey, the locations should be identified in a GIS platform using GIS handset, and the villages nearby the hot spots should be identified. Whether the VPs exists in such areas also need to be found out.

2) Formation and operation of Wildlife Primary Reaction Team (PRT) at the Community Level

After the identification of "hot spots" of life-threatening human and wildlife conflicts, the project would identify 20 key communities/ villages to be supported by the project as models. The intervention points of the project would be:

- a. Capacity building/ training of VP members (average 5 people from a community) on the methods for first reaction to the encounters between human and wildlife. When the existing VP are available, they should be the project implementers. When no such village-level institution exists in the communities identified as a hot spot, then new institutions may be created with the support of project. FNGO under the project and other field functionaries of the project will extend the support for the capacity building. Additional resource persons/ experts would be mobilized for

training as well. The capacity building activities can be done at the village level or in a cluster of villages to cover all 20 target communities.

- b. For the formation of 20 Wildlife PRT at the community level, the project would provide certain stipend to the people in charge of PRT at the village level during the initial stage. UKFD should continue to support such team after the termination of financial support by the project. The team members would be given a set of uniforms and a mobile phone for the communication with the QRT.

3) Formation and operation of Wildlife Quick Response Team (QRT)

A group of professionals should be formed and strengthened for responding to the emergency human and wildlife encounters. The team should consist of 1 ACF, 1 Ranger, 1 Deputy Ranger, 2 Forester/ Forest Guard and 1 Veterinary Medical Officer. The team will be attached to a Circle office, stationed at an Office of DFO, most strategically located around the hot spots identified above.

It is important to note that the medicaments required for animal restrain can be handled only by a authorized, certified veterinary medical officer. Therefore, it is indispensable to have a veterinary medical officer in the team, maybe an officer on deputation from the Veterinary Department. It is also important to note that the veterinary medical officer should be trained in handling the wildlife issues, which are different from the issues of domestic animals. For this, intensive and extensive training should be given to the officer on wildlife management and human and wildlife conflict management techniques, as animal restrain techniques, rescue operation, rehabilitation of restrained animals, translocation, WL medicals, etc. For this, it is recommended that the project support the 10-month training at the Wildlife Institution of India and 5-month training in South Africa, supplemented by 2-week training in Zimbabwe. It is also important to note that the veterinary medical officer should be given adequate administrative facilities and opportunities, such as regular promotions, to be able to continue with the team in a long run.

Necessary equipment and vehicles should be provided by the project, and initial consumables will be provided by the project. The maintenance of such equipment, vehicles and consumables must be ensured by the UKFD with its own fund. The details are indicated in the detailed basis for the cost estimate of this report.

The State of Madhya Pradesh has a successful experience in establishing such teams with the support of Wildlife Institute of India (WII) and the World Bank funded project. They trained a number of officers overseas and in India. Such a model would be referred to for this project.

(3) Project Site Selection Criteria and Process

It is inevitable to have a different set of criteria for site selection for biodiversity conservation and wildlife management from the criteria for rehabilitation of degraded forests. The Survey Team suggests the following selection criteria for each sub-component:

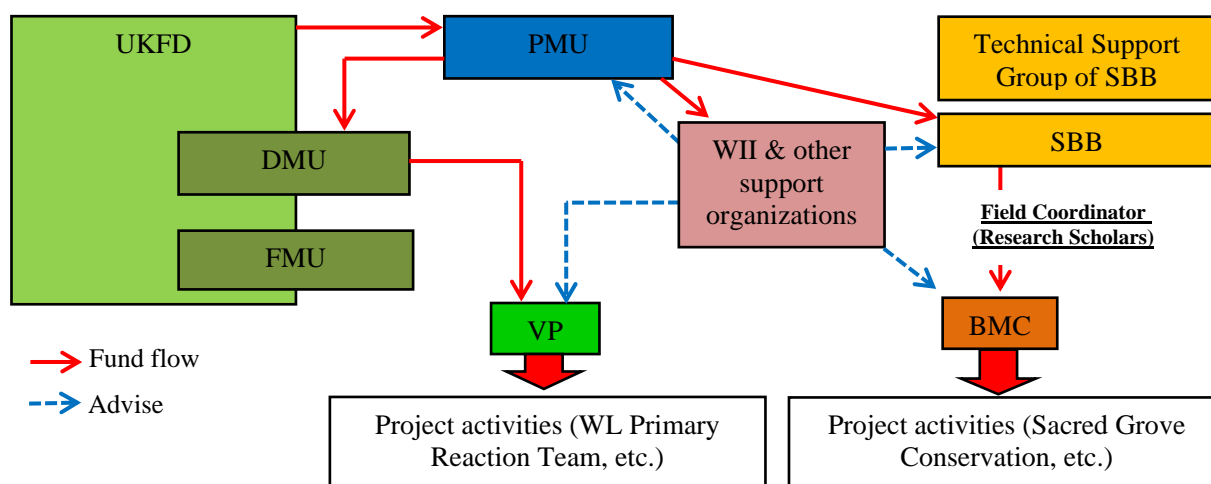
Table 6.5.8 Site Selection Criteria for Biodiversity Conservation and Wildlife Management

Sub-Component	Site Selection Criterion	Remark
Sacred Grove Sustainable Management	1. Located within the selected priority ranges under the project 2. Existence of distinguished ecological and cultural significance for conservation 3. Adequate size of areas for visible impact	13 sacred groves in the state will be targeted. A new BMC will be formed for the management of such sacred groves, or existing BMCs will be strengthened. BMCs will prepare PBR. Since BMC covers large area (Gram Panchayat or Block), day-to-day management will be executed by VP.
Human and Wildlife Conflict Management	1. Located within the identified "hot spots" where the incidents of human and wildlife encounters are reported frequently 2. Preferably within the priority ranges under the project	20 communities will be targeted for PRT, and the circle and division for those 20 communities will be targeted for QRT.

Source: JICA Preparatory Survey Team

(4) Implementation Structure

The project activities and works under the component of Biodiversity Conservation and Wildlife Management will be implemented by the village-level institutions such as Gram Panchayat-level BMCs or VPs. The UKFD directly controls the VPs as the member secretaries of those village-level institutions are from the UKFD as per the relevant laws. However, BMCs are created and registered under the State Biodiversity Board (SBB). They are constituted at either the Gram Panchayat or Block levels, not at the hamlet level as VP. For this, it is desirable to involve SBB during the implementation when BMC will implement the project activities under the Biodiversity Conservation and Wildlife Management Component. The institutional arrangement is shown in the figure below:



Source: JICA Preparatory Survey Team

Figure 6.5.3 Implementation Structure of Biodiversity Conservation and Wildlife Management Component

It is important to note that Field Coordinators (senior and junior research scholars) shall be provided by the project to SBB, as indicated in the detailed cost break up in **Chapter 11** of this report, to facilitate the project activities as well as the flow of reporting (Statement of Expenditure, regular progress report, etc.) so that the fund flow to BMCs will be expedited, while the DMU and FMU will support the activities for VPs.

Scientists from specialized organizations as WII and other research institutions will be engaged to support specific project activities technically as per the needs, and Project Management Consultant (PMC) should have a regular wildlife conservation specialist who can oversee the overall technical requirements for the project and support PMU.

6.6 Analysis on Proposed Livelihood Improvement and Community Development Component and Activities

6.6.1 Entry Point Activities and Livelihood Improvement through Convergence

Entry Point Activities (EPAs) aim at building the rapport between the Executing Agency and VPs at the very initial stage of the project implementation and to form an effective partnership. In conducting the EPAs, the VPs will also gain experiences of organising the members, planning and implementing activities and begin to learn the way of management. EPAs are to be selected during the preparation of micro plan and by the consensus of the villagers, which process will be facilitated by the FNGO Field Coordinators. VPs will be guided to avoid selecting the activities that would benefit only a few individuals in a village. Activities that can strengthen VPs and those related to Basic Human Needs (BHN) can be selected.

The commencement of EPAs would not have to wait until the finalization or official approval of the micro plan and should ideally be carried out before the eco restoration activities begin. However, in case eco restoration works need to be carried out immediately after the preparation of micro plans, the timing of EPA implementation can be adjusted accordingly. BHN related activities can also be implemented from time to time as long as they are planned during the annual planning. EPA implementation guideline will be prepared by the project prior to the micro planning, which is to be followed by the VPs.

Table 6.6.1 Roles of Stakeholders in implementation of EPAs

Stakeholder	Responsibility
VP member (General Body)	<ul style="list-style-type: none"> • Take part in discussion to identify EPA • Give consent to the activities • Take part in the construction/ implementation activities • Take part in the maintenance activity of the assets created
VP committee member	<ul style="list-style-type: none"> • Act as an executing body • Coordinate with FMU/ DMU • Coordinate with other line agency • Organize the VP members and allocate work • Plan for maintenance
Pradhan	<ul style="list-style-type: none"> • Facilitate the convergence with other schemes
FNGO Field Coordinator and animator	<ul style="list-style-type: none"> • Facilitate the participatory decision making in selection of the EPAs • Support VPs to procure the materials and contact other agencies • Monitor the work progress • Report to FMU in case of any problem
DLAC	<ul style="list-style-type: none"> • Make a policy decision to facilitate convergence • Work out the plan of inputs that can be provided by other schemes to the VPs
FMU Staff	<ul style="list-style-type: none"> • Provide guidance to VPs • Monitor the work progress
DMU	<ul style="list-style-type: none"> • Approve the plan • Forward the request to PMU for funding • Coordinate with other line department at DLAC
PMU	<ul style="list-style-type: none"> • Timely release of fund • Approval of the plan

Source: JICA Preparatory Survey Team

EPAs that are proposed to be undertaken by the project can be implemented either with the assistance from the specialized agency or through convergence. In the case of the construction of VP office, the specialized agency's technical assistance will need to be called upon whereas many BHN activities can be carried out through convergence. For this, a policy decision at the High Power Committee (HPC) where the representatives from the line departments convene and make decisions on the project implementation would be effective in facilitating the convergence at the District level and below. The Sarpanch, secretary and animators of VPs will lead the process based on the collective decision made by the General Body (GB) members of VPs.

Once the activity is selected, VP committee members will divide the responsibilities amongst the members and implement the activities. Necessary guidance will be provided by the FNGO Field Coordinators and FMU. In the case of construction of the VP offices, laborers should be mobilized amongst the household members of VP members. Only in the case of labor shortage, the laborers may be mobilized from non VP members.

The rationale and description of EPAs recommended for the project are given as below.

(1) Construction/ Renovation of VP Offices cum Disaster Relief Centre

Many VPs in the project areas do not have an appropriate space to hold meeting or to keep the record books. If they have one, it requires renovation. Having an office space would facilitate VPs to convene on a regular basis and store the documents. This would also contribute to strengthen the cohesion

amongst VP members. Further, given the frequent occurrence of disaster, the proposed VP Building will also be designed to serve as a Disaster Relief Centre where the community members can seek refuge from the disaster and access emergency relief materials. The building will have a storage space in which basic necessities such as solar lamps and batteries, blankets, food items of long shelf life, water purification kit, first aid kit, radio and so on that will help them survive for 2 weeks will be stocked.

A sample field study of social infrastructures, housing specifications and design features has been carried out in Aila VP of Ranikhet Soil Conservation Department. The housing pattern and pattern of living of the local communities along with existing traditional shelter construction practices will be taken into consideration during designing of VP Office cum Disaster Response Centre (VPO cum DRC).

The similar building may be constructed under the project, and the salient features of the building are as follows;

Table 6.6.2 Salient Features of VP Office Building cum Disaster Relief Center

Specifications and Estimated Cost	Description
Plinth area = 41 Sq. Mt. Carpet area of VP Office = 11.10 Sq. Mt. Store / Meeting hall = 22.22 Sq. Mt. Toilet both women and men = 3.14 Sq. Mt. Estimated Cost = INR 404,000/-	The building has been designed as per structurally disaster-resilient (since many of these areas are highly seismic-prone as well Zone IV and V as per earthquake zonation map of India), yet a simple structure which can be erected by local construction artisans and the families themselves.)

Source: JICA Preparatory Survey Team

The details of the VP office are given in **Attachment 6.6.1** and **6.6.2**.

(2) Livelihood Related Activities

The livelihood needs of many communities are still not adequately met. Many women have to spend long hours in search of drinking water, fuel wood and fodder. Drinking water facilities and toilets are not available for all households. The communities in the project areas have raised the issue of wild animal that causes threats to the human life and damages to the crops. These issues are closely linked with women's drudgery and also with the overall well being of the communities and thus activities to resolve or mitigate such livelihood issues can be implemented by VPs by utilising a part of the EPA fund.

On the other hand, in Uttarakhand, many programmes/ schemes are already implemented by other line agencies to cater for such community needs whereas such service have not reached to all the communities equally due to the lack of mobility of the service providers or the lack of funds at the community level in the case of matching fund is required. It may also happen that the lack of knowledge of such available services prevents them to benefit from it as these services are often extended on a demand basis. Thus, the project will provide the funds that can be utilised by the communities to acquire such services but will not directly implement such activities under EPA.

The envisaged activities can mostly be categorized into three: 1) alternative household energy; 2) health and sanitation; and 3) mitigation of man-animal conflicts. Identification of such activities should be done during the micro planning. The process of accessing relevant schemes and programmes will be facilitated by the FNGO Field Coordinators. Cluster Level Micro Planning (CLM) process will further support VPs to mobilize required support from PRIs. A list of the schemes/ programmes for convergence is given in **Attachment 6.6.3**. As these schemes/ programmes would change from time to time, DMU level project coordinator and FNGO Field Coordinators will be required to explore the possible programmes at the time of project implementation. DMU officer will also effectively utilize the District Level Advisory Committee as a platform for multi stakeholder consultation for convergence.

1) Diversifying the Household Energy Sources

In order to keep the houses warm during winter, the bulk of fuel wood still needs to be consumed by the communities in the project area. However, the level of dependency on fuel wood can be reduced by diversifying the energy sources and minimising the consumption. Solar energy (lantern, street lights, and water heating system), bio-gas plant, and small scale hydro power can be introduced to the communities. Power generation using pine needle has also been launched in Uttarakhand, which this project would also introduce as a NTFP based IGA. Uttarakhand Renewable Energy Development Agency (URED) offers a range of programmes in these areas that can support community level alternative energy requirement. Where the existing solar facilities are available within the community but not functioning, unemployed local youth can be trained using the project EPA Fund to acquire maintenance skills which can be done by URED and provide regular maintenance for the existing facilities by URED.

Distribution of fuel efficient *Chullahs* (traditional cooking stove) was proposed in the DPR. The survey team came to understand that such *Chullahs* were not very popular amongst the villagers and require modification in the design and function. Such innovation and customization of the *Chullahs* may be supported by the project by utilising the EPA Fund, if community sees it appropriate. The Government of India also offers LPG gas cylinder for cooking at a subsidized rate. Though the supply is not always sufficient, those villages benefiting from the schemes did reduce the fuel wood consumption to some extent. Thus, where the scheme can be introduced, the project will facilitate the linkage.

2) Fodder

Fodder shortage can be resolved not only by EPA but through a package of interventions in this project. Fodder species will be planted in the VP forest areas under eco restoration activities. Utilizing the BHN/ Convergence fund, the project may also facilitate the linkage with the Uttarakhand Livestock Development Board (ULDB) and Panchayat Raj Institution (PRI) to help communities to establish fodder bank.

3) Health and Sanitation

In many parts of the project areas, ambulance services are available by calling 108. Rural health centre has also been established by the government. Drinking water supply facilities has been provided by Jal Nigam; Uttarakhand Rural Water Supply and Sanitation Programme. Yet, these services have not reached every villages. The project will facilitate the communities to access such services. Health camps can be conducted by Department of Health and Family Welfare (DHF) and rural health insurance services for BPL families are available through Rashtriya Swasthya Bima Yojna II. The discussion can be held during the preparation of CLM, and FNGO Field Coordinator and DMU project coordinator will help the VPs to mobilise required services. DMU will also propose required assistance during the District Advisory Committee (DAC).

4) Man-Animal conflict and Rural Link Road

One of the mitigation measures to prevent crop damage by wild animals can be fencing. Department of Horticulture (DOH) provides support for establishing the fence. Rehabilitation of rural link road is supported by Pradhan Mantri Gram Sadak Yojna under Department of Rural Development (DRD).

6.6.2 Mechanism of SHGs, Supports and Operations

The market linkage, production management and quality control are the main issues in the IGAs. These technical issues are caused by the lack of appropriate planning and technical guidance. Thus, the project will provide the proper business development plans, technical guidance and regular handholding for minimum 3 years for each SHG.

When planning an IGA, one would also need to consider the current level of workload of women. While providing the drudgery reduction measures, the project will promote IGAs that are not so time-consuming especially at the initial stage but generate income within a short span of time.

The project aims at increasing the productivity of the on-going livelihood activities such as dairy and NTFPs through promoting the improved production techniques, sustainable harvesting methods and improved post harvesting techniques. This means that the communities will develop financial capacity to procure the necessary materials from outside and do not have to exclusively depend on the forest resources nearby. Harvesting can also be optimized so that they will not need to harvest from the larger forest area unnecessarily and exploit the resources to the extent the natural regeneration is not possible. In this way, gradually, the communities will be able to reduce the dependency on the forest resources and allow the natural regeneration of the forest resources.

From sustainability point of view, the project will also promote the development of cluster level organization that will continue to provide the marketing, financial and technical services to the members even after the project life. The adequate technical and marketing support will be ensured by the project through FNGOs and establishment of NTFP Centre for Excellence (NCE). The overall strategy of IGAs is as below.

(1) Mode of Implementation – SHG mode

The socio economic condition of the project area suggests that the majority of the potential SHG members would not have sufficient economic capacity to become liable for other members loan as in the case of JLGs. Further, the accessibility to the financial institutions in many parts of the project areas may be difficult where JLG members would access the funds. On the other hand, SHGs will create savings amongst the members which can be used as capital for IGA and can be extended as a loan to the members. This will create a financial base for the SHGs to initiate IGAs and also provide stability in household economy amongst the SHG members. Thus, the project will adopt SHG mode of operation in implementing IGAs.

(2) Formation/ Adoption of SHGs

The objectives of forming SHGs are to improve livelihoods to provide alternatives to the forest resources and thus to minimise the dependency on them. Thus, priority will be given to vulnerable sections of the community including BPL families, de-facto/ de-jure woman heads of household, landless families, SC/ ST, whose dependency on forest resources are high. The identification of such families will be done during the PRA exercises during micro planning. Members' interest and level of motivation will also be taken into consideration in the SHG formation process. This process will be facilitated by FNGOs based on the guidelines prepared by the project.

The Survey Team also envisages a case that the SHGs already exist in the project areas as many SHGs are already formed in Uttarakhand. In such cases, the project will give priority to the groups: 1) the candidate SHG, as a group, has not defaulted any previous loans extended by financial institutions; 2) SHGs that do not have the current outstanding balance and 3) the members are motivated to improve their livelihoods in addition to the member priority criteria for the new SHGs.

Table 6.6.3 Preliminary SHG selection and member priority criteria

Priority Criteria of Existing SHGs	Priority Criteria for SHG members (Applicable to existing and new SHGs)
<ul style="list-style-type: none"> - Not defaulted in the previous loans - Members share a common goal - to improve their livelihoods - Members are motivated to work together - Priority will be given to those which have no outstanding loans 	<ul style="list-style-type: none"> - BPL - De-facto/ De-jure woman heads of households - SC/ ST - Motivated to improve their livelihoods - No previous record of defaulting from internal lending in other SHGs.

Source: JICA Preparatory Survey Team

Gender will not be a bar in the formation/ adoption of SHGs. Male groups and mixed gender groups may also be considered if they meet the above mentioned criteria. However, the priority will be given to women since many preceding cases show that the financial gain among women would benefit the household members as a whole in comparison to that of men.

(3) Number of SHGs to be supported

The DPR proposes 1-4 SHGs (average 2) per VP to be supported depending on the population and the necessity of the SHGs in the villages. The figure is deemed appropriate from the project operational point of view. Although the total number of the SHGs would remain constant as it is the maximum number of SHGs that can be effectively supported by the project.

The project direct interventions will be provided to these SHGs, nevertheless, the ripple effect of the project interventions is likely as has been seen in other JICA supported project where the SHGs in the surrounding areas also gained knowledge and skills through their associations and the same will be expected here. Further, the project will not limit the participation of the non project supported SHGs to take part in the Cluster Level Organisations when they express interest. In this way, the project will be able to support much larger number of SHGs in the project area.

(4) Preparation of Field Manual for SHGs

Field manual for SHGs will be prepared for general group management aspect and for IGA specific technical manual prior to the identification of the 1st batch SHGs. The general manual will describe the objectives of SHG, internal decision making process, records to be kept, process of internal saving and lending, and procedures to access revolving fund. The technical manual will also be developed by the project for various IGAs and can be designed by the FNGO experts with the guidance from PMC. A booklet on the basics of business management and entrepreneurship will also be prepared by the project.

(5) Market Survey and Scoping Studies

Although respecting the interest and preference of the SHG members in selection of IGAs would be important, it is critical to have a proper business plans to make the chosen IGA economically viable and sustainable. Thus, the project will invest in conducting market survey and scoping studies at the initial stage. The survey will identify the potential products and market opportunities. The survey design will be prepared by the project with support by PMC Specialist and be conducted by the Surveyors deployed by the project. Depending on the timing, FNGO Marketing Support Staff may also be engaged in this process. Based on the survey results, PMC Specialist and FNGO Marketing Support Staff will prepare model business plans and cluster development plans that can be adopted by the SHGs. This process should be completed before the formation/ selection of 1st batch SHGs.

(6) Convergence for IGAs

During the business planning process, the project will identify various resources that are available from other programmes/ schemes that can contribute to implementation of IGAs, and seek the possibility of convergence. Department of Animal Husbandry, Agriculture, Horticulture provides various schemes to support the IGAs that are recommended for this project.

(7) Selection of IGAs

The selection of the IGAs will be carried out by SHGs with facilitation of the FNGO Field Coordinators. SHG members will carry out the community resource assessment and local market analysis in order for them to understand the local conditions. Based on the results, they will shortlist the activities that they are interested and motivated to undertake. Out of the short listed activities, selection should be made by the consensus of the SHG members. The FNGO Field Coordinators may share the model business plans, if the model business plans of the short listed IGAs are available, and discuss with SHG members to accommodate the local specificity. In case, the SHG members chose the activities other than the model business plans, FNGO Marketing Support Staff and Field Coordinators will prepare the business plan in consultation with SHG members.

Further, as seen in UDWDP, the project is also required to comply with the social and environmental safe guard policy. For instance, promotion of dairy may negatively impact on the forest resources if done in the conventional way. Thus, the project will incorporate the measures to minimize the negative impacts on the forest resources by introducing alternative or improved methods or practices.

From the social consideration point of view, the project livelihood activities will be inclusive and socially acceptable.

(8) Fund flow to implement IGAs

The project will support the cost of the technical training and the cost of the essential items for 1st cycle and fixed assets that may be required for start up. Once the IGAs are selected and business plans are ready, they will be submitted to VPs. The cost of technical training will be directly met by the project. The cost of material for the first cycle will be transferred to the SHGs through VPs once the business plan is reviewed by VPs. For reviewing the business plan, a checklist will be prepared by the project that can be used by the VPs. In the case of NTFP Cluster level business development, the SHG federation at the cluster level will prepare a business plan with the guidance from PMC and NCE. The fund will be transferred to the SHG federations from NCE. Funding mechanism for NTFP IGAs will be further elaborated enterprise wise in **Attachment 6.6.4**.

(9) Cluster Development

Further, as it is often difficult for small SHGs to operate in isolation and to survive, the project will promote cluster development and formation of a cluster level organization. The cluster level organization can facilitate its member SHGs to access market, various financial and capacity building services and procurement of the materials/ inputs that can be sold to its members at the lower rate. The formation of Cluster level organization will be initiated during the 2nd year of the 1st batch SHGs support. The project will avail the fund for the staff and initial operational cost of the cluster level organization for 3 years from the formation of the organisation.

(10) Revolving Fund

In the hill communities, access to financial institutions is limited in comparison to plain area. The middlemen could lend money to the primary producers and could also act as a farm input distributor while transporting the produces from the villages to the market. Further, they do not have alternative funding sources to invest in expanding the scale of livelihood activities and thus, the profit they earn remains small. In order to enhance the financial security of the SHG members and allow them to earn more, the project will provide Revolving Fund to SHGs through VPs.

The amount of INR 50,000 per SHG will be transferred to the bank account of VP as a grant from the project to be used as a revolving fund for SHGs. An application including business plan and loan repayment schedule should be submitted by SHGs in the prescribed format by the project to VP. VP will review the application at the executive committee meeting and assess its eligibility. The interest should be levied on the principle amount at the rate adopted by the VPs based on the interest rates suggested by the project. All SHG members will be collectively responsible for the repayment. In case, non project supported SHGs in the same VP area request a loan, they may also be allowed to access even during the project period providing no project supported SHGs require a loan. In such case, the applicant SHG needs to submit the application and business plan as the project SHGs would do.

The detailed guidelines for managing revolving fund including the detailed procedures of review process and criteria of the loan application, record keeping and monitoring of the loan repayment will be developed by the project prior to the identification of the 1st Batch SHGs.

(11) Deployment of NGOs and Management

In the project, 6 FNGOs will be engaged. The FNGOs will place 1 Marketing Support Staff at each DMU for 5.5 years and Field Coordinators to look after VPs and SHGs for 3 years. The Marketing Support Staff will assist the SHGs to develop business plans, establish market linkage and facilitate convergence. Each Field Coordinator will support 4 VPs and 8 SHGs and carry out community mobilisation and regular follow up with SHGs in addition to facilitation of micro planning process and convergence. FNGOs will also engage subject matter specialists for up to 5 months a year for different subject areas such as horticulture, livestock and handicrafts according to the requirement of the SHGs. The procurement will be done through local bidding. The draft TOR, preliminary selection procedure and deployment plan are attached in **Attachment 6.6.5**.

Table 6.6.4 Proposed NGO Deployment Plan

Circle	Division	Number of ranges	VP Selection				No of NGOs to be engaged	Marketing Support Staff	Field Corodinator			
			Batch 1 (100 VPs)	Batch 2 (350 VPs)	Batch 3 (350 VPs)	Batch 4 (200 VPs)			Batch 1	Batch 2	Batch 3	Batch 4
Shivalik	Lansdown S C	3	8	28	28	18	1	1	2	9	8	4
Yamna	Mussoorie	2	6	18	18	12		1	2	5	5	3
Bhagirathi	Narendranagar	3	8	28	28	18	1	1	2	7	7	4
Bhagirathi	Tehri Dam-1	2	6	18	18	12		1	2	5	5	3
Garhwal	Alaknanda S C	3	8	28	27	18	1	1	2	7	7	4
Garhwal	Pauri C & S	3	8	28	27	18		1	2	7	8	4
N. Kumaon	Almora C & S	3	8	28	27	18	1	1	2	7	7	4
N. Kumaon	Bageshwar	3	8	28	27	18		1	2	7	7	4
N. Kumaon	Champawat	3	8	28	27	18	1	1	2	7	8	4
N. Kumaon	Pithoragarh	3	8	28	27	18		1	2	7	7	4
S. Kumaon	Nainital S C	3	8	28	27	18	1	1	2	7	7	4
S. Kumaon	Ramnagar S C	3	8	28	27	18		1	2	7	7	4
S. Kumaon	Ranikhet S C	3	8	27	27	18		1	2	7	7	4
Total		37	100	343	335	222	6	13	25	88	88	50

Source: JICA Preparatory Survey Team

Although NGOs possess the skills in community mobilisation, facilitation and livelihood, they need to be guided and their performance needs to be monitored by the project. Therefore, a package of capacity building programmes will be conducted upon their engagement. Their performance indicators and mechanism of NGO performances for monitoring of the performance of NGOs will be placed by the project. An annual review meeting of FNGOs is also proposed to be conducted. The FNGO contract will be signed by PMU.

(12) Facilitation of Accessing Market Information

Lack of access to agriculture information has prevented the primary producers to produce the better quality produce and to sell at the time of high market price. The project will provide the technical support through the specialists engaged by FNGOs, however, the alternative mobile phone based agriculture information system will also be promoted as that will benefit the primary producers in the long run. There are two services which are widely known. One is the Kissan Call Centres by the Department of Agriculture and Cooperation. Farmers can call toll free number and seek guidance on the queries in farming. The other is the Reuters Market Light that provides a customised farm information system and can be introduced to the project areas with a minimal subscription charges.

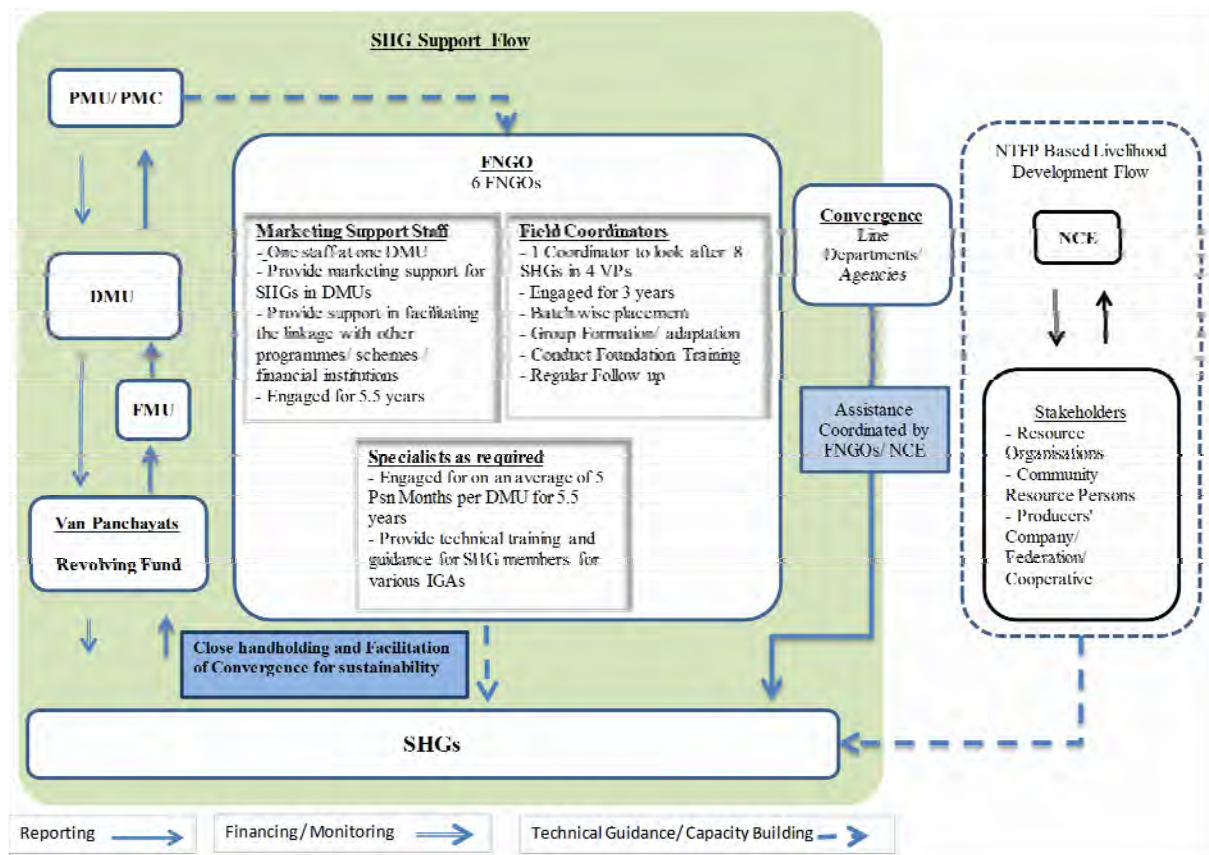
(13) Supporting Mechanism for Promotion of IGAs and SHGs

The project will implement the IGAs through SHGs. SHG model will allow the vulnerable segments of a community to create the financial security by way of creating internal savings which they can rely on when they are in need of immediate cash. This is particularly important where the access to financial institutions is limited. The formation/ revamping the SHGs will be carried out by the facilitation of the FNGO Field Coordinators after the selection of the VPs. SHGs will be given the training programmes on the topics including group management, basic record keeping and handling of fund. They will begin the internal savings as soon as the member list and by-laws are prepared. Once the internal savings and lending process begins, the readiness of SHGs for starting the IGAs will be assessed by the FNGO field coordinator. The grading of SHGs may be carried out by adopting National Bank for Agriculture and Rural Development (NABARD) criteria after 6 months of formation.

The FNGO field coordinator will begin the local resource assessment and market survey along with the SHG members. This will help them to understand the initial process of starting a business. Based on the results, the discussion will be held amongst the SHG members to identify the possible IGAs that they are interested in and that have the market potential. FNGO Marketing Support Staff will support in assessing the technical feasibility and resource availability. Once the chosen activity is found viable, the business plan will be prepared by the FNGO Marketing Support Staff and Field Coordinators in consultation with SHG members.

As the market access is a key to the success of IGAs, the project will provide such support through FNGO Marketing Support Staff. In locations where a cluster of a particular IGA is deemed viable, SHGs will be promoted to form a cluster level organization for coordinated production and effective marketing.

Field Coordinators that are engaged through FNGOs will support the VPs and SHGs for 3 years. The timing of their engagement will be according to the selection of VPs. Each FNGO coordinator will look after 4 VPs and 8 SHGs. Field Expert will be deployed at Circle level. Each FNGO will also engage the subject matter specialists to provide technical training and guidance for SHGs. The business plan preparation will also be supported by the FNGOs and the specialists engaged by them. In the case of NTFP based IGAs, as proposed in the following section, NTFP Centre for Excellence will provide technical guidance and marketing support. The FNGOs will be procured through local bidding following the applicable laws and regulations in Uttarakhand.



Compilation: JICA Preparatory Survey Team)

Figure 6.6.1 Support Mechanism for SHGs

(14) Evaluation of the performance of SHGs

SHG accounts will be audited on an annual basis. The amount of saving and lending, and annual profit will be monitored as the key quantitative indicators for their performance through project MIS. They will also be assessed by the qualitative indicators such as the consistency in keeping the records, frequency of meetings and level of attendance. FNGO Field coordinators will also provide monthly observation report to the DMU and to PMU as part of their monthly report.

(15) International Market Opportunities and Linkage

The opportunities for the project to collaborate with Japanese firms exist. Once the project implementation begins, a PMC specialist will explore further possibilities and initiate actual collaboration process. The specialist will also carefully review the applicable laws and regulations on

trading of the NTFPs and Medicinal Aromatic Plants (MAP) and their produces between India and Japan as well as the market potential and marketing strategy for Japan.

(16) Corpus Fund

Corpus Fund is a fund comprised of fixed deposit and interest accrued on it. A fixed amount will be kept in a bank account for a set period of time to earn interest, which can be utilized for other purposes. The project proposes each VP to have a corpus fund. The interest accrued on the corpus fund will enable the VP to carry out the activities according to their requirement beyond the project period. As we have witnessed, the weakness of the financial capacity of VPs has prevented them to undertake the forest management works as they should have. Thus, creation of corpus fund will ensure the sustainable functioning of VPs and management of VP forests.

Suggested sources of Corpus Fund include; 1) Remaining balance of watch and ward; 2) SHG revolving fund if no longer required; 3) Revenue from NTFPs; and 4) Interest accrued during and after the project period. Such amount should be kept in the fixed deposit account during and after the project and once the project is completed, it can be used by VPs.

The process of creating a corpus fund will begin during the project implementation period. VPs will receive a lump sum fund from the project to be used for implementing project activities. A part of such fund can be managed at their discretion. For instance, the fund allocated for watch and ward may not be utilized fully to carry out the work. In some VPs, revenue from resin tapping or other harvesting of NTFPs can also be saved as corpus. Once the SHGs are linked with other financial institutions and the need for revolving fund does not hold valid, it can also be added as corpus. These funds can be kept as corpus to earn interest, which can be utilized during the post project period. The corpus should be placed in a fixed deposit account during the project period and beyond to earn interest.

The detailed guidelines for creation of Corpus fund will be developed before the selection of 1st batch VPs and operation and maintenance of corpus fund to be developed during the phase out period. The monitoring of the corpus creation will be done by the project and also through regular audit and social audit which provisions are already made in the project.

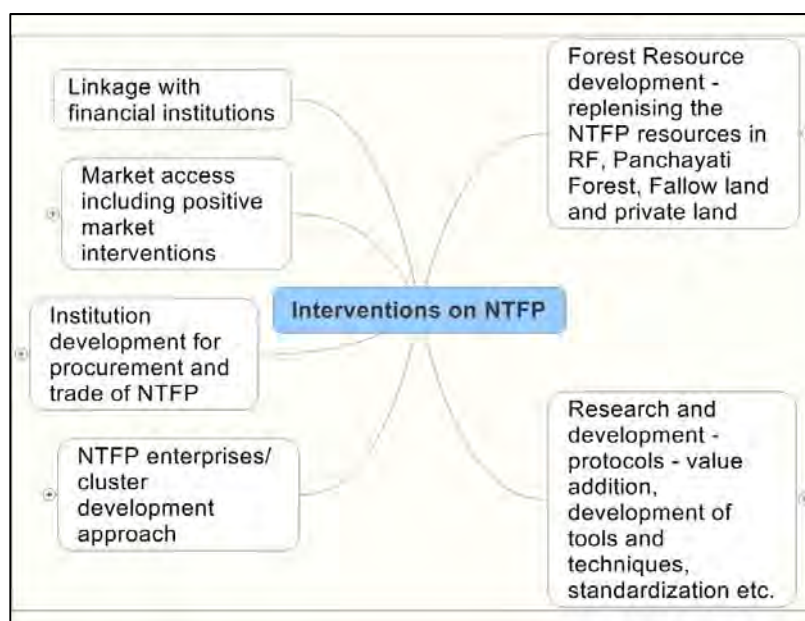
6.6.3 NTFP-Based IGA

The NTFP enterprise development strategy shall include both resource development and promotion of community managed enterprises involving primary and secondary level of value addition. Resource development strategy shall emphasize on a) replenishing resources in RF, forests of VPs through eco restoration and NTFP plantations, b) Use of fallow land for cultivation/ afforestation of different NTFPs and c) Development of Protocols for sustainable harvesting and value addition of different NTFPs.

(1) NTFP Enterprise Development

The project has prioritized NTFPs as below. These produces require to be traded in bulk that is possible by consolidating the production of small scale producers through cluster development. They also need the improvement in harvesting technologies and upgrading of the post harvesting technologies. Efforts shall be made to strengthen the value chain in favor of primary producers and their organizations/ SHG Federations with the help of NTFP Centre of Excellence (NCE) and FNGO. In the initial years the strategy is to work on the establishment of demonstration models of enterprises in selected clusters run by producer organizations and thereafter efforts shall be made to replicate them at a higher scale involving various stakeholders including financial institutions.

NTFP enterprise development activities should not be limited to the Project area. The SHGs and SHG Federations should be in a position to procure NTFPs from nearby project and non-project villages and forest areas which are open for collection of NTFPs. This would help them to achieve economy of scale and make the enterprise economically viable. In case of Lichen and Moss Grass the Project proposes to work in Badrinath Forest Division, which is not part of the Project Area because more than 85 per cent of the Lichens and Moss Grasses harvested and sold in the state come from Badrinath Forest Division. There is a



Source: JICA Preparatory Survey Team

Figure 6.6.2 Interventions on NTFP

great potentiality to improve the value chain, ensure sustainable management of the produce and further more enhanced employment opportunity for the primary collectors.

Table 6.6.5 Key NTFPs to be focused by the Project

Name of the NTFP	Type of intervention	Scale	Institution to be involved
Lichens and Moss grass	<ul style="list-style-type: none"> Sustainable harvesting Primary value addition – cleaning, drying, grading, packaging and proper storage Strengthening the value chain through proper open auction and/ or direct sale Field research on propagation 	2 clusters – 40 SHGs and 400 primary collectors. Two SHG Federations shall be responsible for value addition.	<ul style="list-style-type: none"> SHGs and SHG federation VPs FNGO NTFP Centre of Excellence (NCE) Forest Development Corporation
Honey	<ul style="list-style-type: none"> Promotion on bee keeping Organization of bee keepers and their capacity building Enhancing honey production Processing and marketing of Honey Organic certification 	6 clusters– 150 SHGs and 1500 bee keepers	<ul style="list-style-type: none"> Primary producers Specialized NGOs/ Technical Agencies Producer Company NCE
Pine Resin	<ul style="list-style-type: none"> Creating awareness among the VPs and Resin Tappers on sustainable harvesting from VP forests. Piloting of harvesting through VPs to improve quality Experimentation of Bore hole methods, development of appropriate tools 	One Forest Division/ Range – Two clusters and about 20 VPs	<ul style="list-style-type: none"> VPs NCE Research Institutions
Natural fibers with a focus on Himalayan Nettle	<ul style="list-style-type: none"> Market feasibility study R&D on energy efficient processing technology Cluster development initiatives for processing of fibers Wild craft certification 	2 clusters - 50 SHGs and 2 SHG Federations	<ul style="list-style-type: none"> NCE Uttarakhand Bamboo and Fiber Development Board Research Institutions SHGs and SHG Federations
Natural dyes	<ul style="list-style-type: none"> Market feasibility study R&D on energy efficient processing technology 		<ul style="list-style-type: none"> NCE FRI and other Research Institutions

Name of the NTFP	Type of intervention	Scale	Institution to be involved
Pine needles	<ul style="list-style-type: none"> Promotion of biomass based gasifier for electricity production, briquette making etc. (PPP mode). R&D on briquette making and also fodder development using Pine needles 	1 cluster – 2-3 VPs	<ul style="list-style-type: none"> VPs URED A Private entrepreneurs on PPP mode MNRE Research Institutes
Tejpatta	<ul style="list-style-type: none"> Primary processing Strengthening the value chain/ floating auctions Enhancing the production Positive market interventions 	4 clusters – 120 SHGs – 4 SHG Federations	<ul style="list-style-type: none"> SHGs SHG Federations NCE
Medicinal and Aromatic Plants	<ul style="list-style-type: none"> Cultivation through SHGs on the private land/ fallow land Primary processing Supply to pharmaceuticals and other industries 	4 clusters – 120 SHGs	<ul style="list-style-type: none"> SHGs SHG Federations HRDI SMPB CAP NCE
Other NTFPs	<ul style="list-style-type: none"> Developing sustainable harvesting and value addition protocols. 	To be determined after the preparation of micro plans by the VPs	<ul style="list-style-type: none"> NCE SHGs SHG Federations

Source: Primary survey and consultation with different stakeholders by the JICA Preparatory Survey Team

In the case of Moss and Lichen, the inefficiency of the registration system of the middlemen has been an issue. Thus, the Survey Team proposes the project to allow VPs to harvest within the selected area on a pilot basis. The demand of Lichen and Moss is high and market potential is also high. Thus, the support from a specialised agency in improving the quality, value addition and marketing and appropriate harvesting technology would benefit the primary producers. If this can be implemented, it would require the changes in the NTFP policies in the state.

Approximately 480 SHGs shall be involved in NTFP based enterprise development activities and it is assumed that 4,800 households shall be covered by these enterprises. The following key activities shall be carried out for enterprise development.

- Identification of clusters
- Identification of FNGOs and Technical support agencies
- Formation of SHGs or adoption of existing SHGs
- Identification of SHG Federations or formation of SHG Federations, if necessary
- Orientation and training to these SHGs on sustainable harvesting from the wild, value addition and enterprise management
- Detailed business planning with cost estimates
- Procurement of inputs for the SHGs and SHG federations from the Project
- Providing revolving fund to the SHG Federations for running the enterprise
- Building linkages with the Financial Institutions/ other Projects and Schemes for financial support to these enterprises
- Providing necessary support to the SHGs and SHG Federation to set up the enterprise and manage it efficiently
- Ensure quality control of the enterprise and provide necessary technical support for quality improvement of the products
- Negotiations with the buyers/ processing industries for sale of products from these enterprises
- Facilitate open auctions at project sites and also in the NTFP Mandis
- Support SHGs and SHG Federations to establish mechanisms for profit sharing and sustaining the enterprise

The Project shall make efforts to collaborate with different technical, financial and market agencies to promote and strengthen enterprises on NTFP and also to carry out different Research and

Development activities on low cost value addition technologies, sustainable harvesting and value addition protocols for selected NTFPs.

There are number of institutions/ agencies in the state, who claim to have been working on NTFPs and MAPs. State Medicinal Plants Board, Herbal Research and Development Institute, Centre for Aromatic Plants, Forest Development Corporation, Kumaon Mandal Vikas Nigam, Garhwal Mandal Vikas Nigam, Bhesaj Development Unit and District Bhesaj Sanghs, and VPs are the important institutions currently engaged in collection, processing and marketing of NTFPs. Most of them focus on promotion of cultivation of medicinal plants on the private land. Forest Development Corporation, which is at the helm of affairs of NTFP marketing, has been mostly managing the NTFP Mandis/ Markets in Bibiwala, Ramnagar and Tanakpur. The role of these institutions in NTFP resource development in forest, sustainable harvesting and management, enterprise development and market development is very limited. There is inadequate coordination among these institutions to develop collaborative and collective interventions for NTFP based livelihood promotion, which has enormous scope for addressing poverty in the hills. VPs (VPs) seem to lack sufficient capacities to promote sustainable harvesting and marketing of NTFPs. Moreover, majority of VPs have a small area to protect and manage and apart from harvesting of lichens and mosses in selected forest divisions their role in collection, value addition and marketing of NTFPs is very limited.

The details of recommended strategy for the NTFP enterprise development is illustrated in details in **Attachment 6.6.6**.

(2) NTFP Centre of Excellence (NCE)

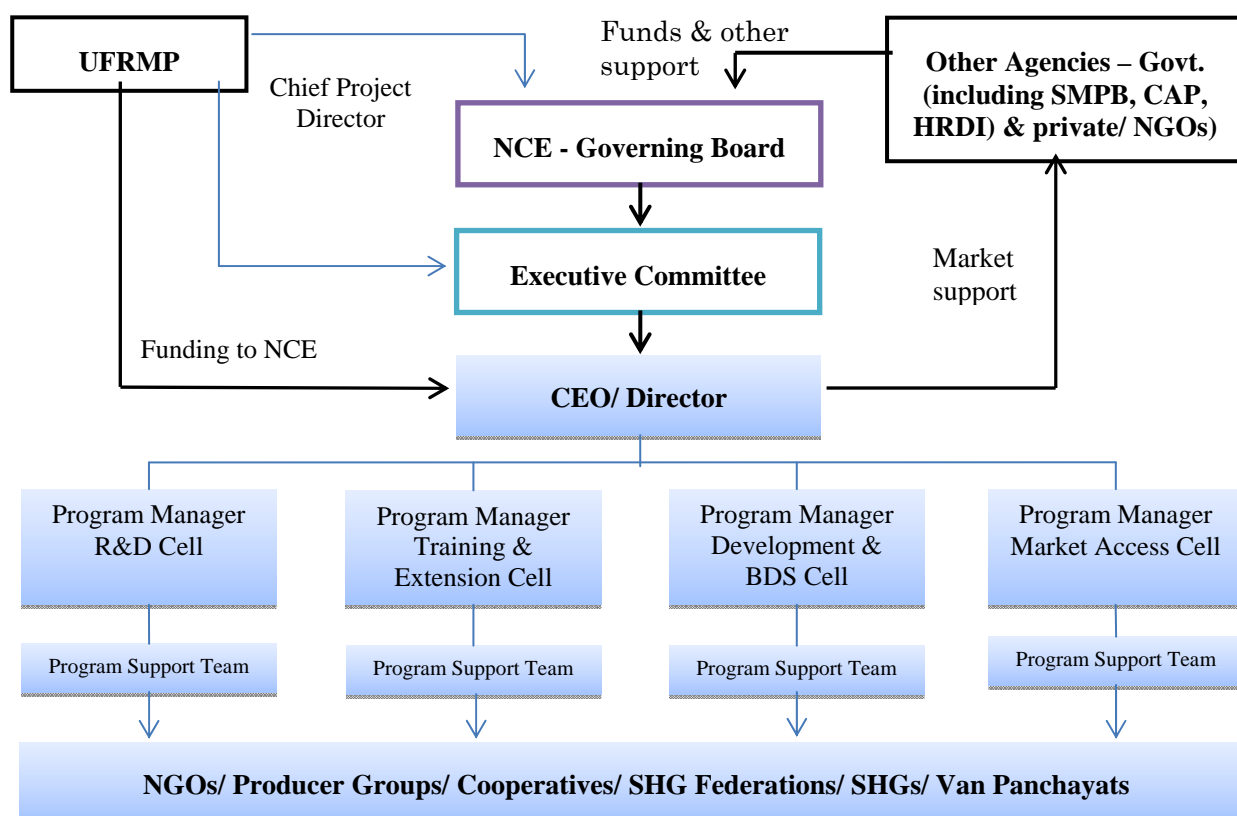
In support of the above proposed interventions, a NTFP Centre of Excellence (NCE) shall be established at the state level to coordinate all the activities concerning NTFP management and trade such as resource development, research and development, training and extension, enterprise development and marketing. NCE shall be registered as a society and its governing body shall have representations from different Government Departments, Agencies, Research Institutions, Cooperatives, Civil Society etc. The main objective of having this centre is to enhance the scope of livelihood options from collection, cultivation, primary processing, higher level value addition and marketing of NTFPs. The project activities on NTFP based livelihood shall be implemented through NCE. A detailed note on the establishment of NCE has been provided in **Attachment 6.6.7**. The Centre shall establish a market information system for the primary producers as well as the buyers/ industries and shall play a proactive role in market development for NTFPs.

The establishment of NTFP Centre of Excellence (NCE) is the need of the hour to bring back focus of the Government and Private sector on NTFP resource development and enterprise development as a strategy to address poverty and food security in the hills. It would try to provide one stop solutions to primary collectors/ producers and their federations/ associations in sustainable management of NTFP, production enhancement, higher level value addition, use of appropriate technologies, enhanced access to market and other business development services. NCE shall be an independent body to promote enterprises and markets on NTFP. The broad objectives of NCE have been presented below:

- ✓ To assist the Government in appropriate policy formulation for strengthening NTFP based livelihood.
- ✓ To initiate Research and Development on NTFP processing/ value addition technologies, new product development, appropriate tools for harvesting and processing etc. in collaboration with different technical institutions.
- ✓ To carry out inventorying of NTFPs, create and manage database on NTFP potentiality, traditional use, enterprises, markets etc.
- ✓ To promote community based enterprises on NTFP in collaboration with different government and private sector agencies.
- ✓ To carry out market feasibility studies on different NTFPs and create and manage appropriate market information system.

- ✓ To enhance access of communities/ producers to market and undertake positive market development interventions.
- ✓ To advise the Government on NTFP resource development and carry out field research on production enhancement operations for selected NTFPs.

NCE shall be registered as a society under the Societies Registration Act or Section 25 company under Indian Company Act. The Governing Body shall have representation from the Government, Other Societies/ Boards, NGOs, Cooperatives, Producer Groups, Academic/ Research Institutions etc. The functional team shall comprise of Chief Executive Officer or Director, Programme Managers, Programme Executives and Support Staff and the most of the team members would be hired from the market.



Source: JICA Preparatory Survey Team

Figure 6.6.3 Organizational Structure of NTFP Centre for Excellence

The activities of NCE shall be guided by a 5-year strategic plan prepared immediately after the formation and engagement of staff. NCE shall have four cells – a) Research and development, b) Training & Extension, c) Enterprise Development/ Business Development Services, and d) Market Access.

Sustaining any institution requires commitment of funds from the Government as well as from other Agencies/ stakeholders. NCE requires a kind of continuous support for 5-10 years so as to strengthen its own institution and establish its credibility before the producers as well as the buyers and processing industries in the market. Some possible sources of financing of NCE have been presented below:

- ✓ Operation costs for 7 years from JICA assisted UFRMP;
- ✓ Priority access to funds available under different Government Programmes and Schemes;
- ✓ Fund raising through business development services and training and extension services;

- ✓ Participation in different call for proposals/ bids for research and development, enterprise development etc; and
- ✓ Accessing funds from the private sector for setting up enterprises.

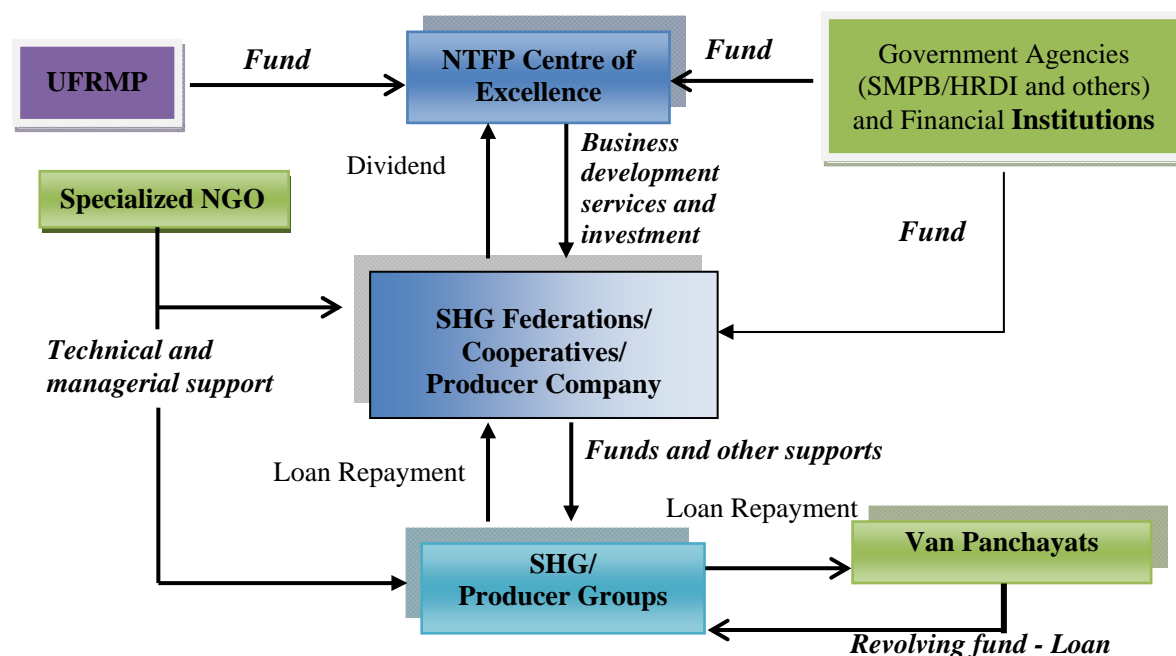
In case of NTFP enterprise development at the cluster level, the NCE shall provide financial and technical support to the SHG Federation to complete one cycle of the enterprise. Subsequently the SHG Federation has to run the enterprise and if there is any expansion of business NCE shall establish linkages of SHG Federations with financial institutions. NCE, if needed, can also provide financial support from the enterprise challenge fund as a loan.

In addition to cluster level NTFP enterprises there may be SHGs intending to do small income generation activities on NTFP at the village level. During the micro planning process at the VP level the priority areas of IGAs shall be identified. This may include some activities on NTFP by SHGs. These activities shall be supported through the revolving fund placed with VP. The FNGO under the guidance of NCE shall provide necessary support to these SHGs.

The specialized NGOs shall be engaged in mobilization of communities, community capacity building and running of some of the enterprises. For cluster development projects on Honey, Lichens, Fibers and MAPs, NCE shall raise funds from the Project and also from other sources and it shall manage the funds required for these enterprises. NCE in consultation with appropriate authorities shall determine the fund flow to different enterprises on case to case basis. The mechanism for reporting shall be decided for each enterprise. Each enterprise has to provide both physical and financial reports to NCE periodically (monthly or quarterly based on the NTFP item).

Initial foundation and business management programs will be provided jointly with the FNGOs. PMC Specialist will provide support to NCE at the initial stage of its operation.

Suggested organizational framework for fund flow for NTFP based IGAs/enterprises has been provided below:



Source: JICA Preparatory Survey Team

Figure 6.6.3 Fund Flow of NTFP Centre for Excellence

NCE would require infrastructure as listed below:

- a. NCE Office building and training halls (around 700 m²)

- b. Hostel for 30 visitors (10 for resource persons and 20 for participants) (approximately 1,800 m²)
- c. Godowns/ Floating *Mandi* (x 2 units) (approximately 250 m² each, total of 500 m²)

6.6.4 Ecotourism

(1) Key Focuses for Ecotourism

The DPR states that the promotion of community-based ecotourism is one of the important livelihood improvement initiatives under the proposed project to provide alternative source of income and poverty alleviation, which are not consuming or damaging natural environment and resources. The DPR also mentioned that the strengthening of existing Center for Ecotourism and Sustainable Livelihood and destination site development will be undertaken by the proposed project, and these works will be carried out by VPs in the project areas.

UKFD (CCF Ecotourism) has suggested the following areas of interventions and proposed activities as summarized in the table below:

Table 6.6.6 Proposal of UKFD on Ecotourism Development

Item	Proposed Intervention
Ecotourism Policy for Uttarakhand	Revised an ecotourism policy for Uttarakhand and prepare a policy for community-based ecotourism (CBET) with rights and incentives, including mechanism for financial support and access to forest areas
State Level Ecotourism Institution	Up gradation of Centre for Ecotourism and Sustainable Livelihoods or the creation of a new institution as the existing one is almost defunct
Regulatory Framework	Preparation of: <ul style="list-style-type: none"> - Regulations for ecotourism activities based on the assessed carrying capacities for destinations - Operational guidelines for ecotourism in mountain areas with rational & fair fee structure
Capacity Building	Designing of course curriculum, development of course materials and organization of training courses, study tours and events
Research	Provisions for research projects, surveys and short term studies
World Class Ecotourism Product Development	<ul style="list-style-type: none"> - CEBT in Kedarnath valley - Bird watching in Pangot area in the vicinity of Nainital - Homestay and gilli-based angling in Pancheshwar area in Champawat - Network of trails in Rajpur – Mussoorie area and Sahastradhara Suakholi area near Dehradun Capital - Canopy walk / adventure park near Kotdwar – Santh Kolhuchaur

Source: JICA Preparatory Survey Team based on the note submitted by UKFD

It should be noted that ecotourism is a business enterprise, and it is important to identify areas with high ecotourism potential, as not many areas would be suitable for such business venture.

(2) Target Areas and Beneficiaries

The project activities shall focus on promoting Community Based Eco Tourism (CBET) through the development of 7 tourist circuits in various parts of Uttarakhand, preferably within the project area (37 ranges). Each tourism circuit would comprise of a cluster of around 10 villages. Each cluster would have about 200 community based entrepreneurs and the project target would be 1,000 community based entrepreneurs.

Alaknanda Soil Conservation Division, Champawat Forest Division, Mussoorie Forest Division, Nainital Forest Division, Pauri CS Division and Pithoragarh Forest Division could be the potential project areas for promotion of CBET.

(3) Target Customers

The community-based ecotourism activities shall seek to attract a diverse group of tourists which shall include:

- Nature lovers
- Researchers.
- University/College/School students.

Periodic nature education camps would be conducted especially for imparting nature education to school and college students.

(4) Implementation

The project activities shall be implemented through VPs (VPs). These institutions shall work with SHGs formed in these villages. The VPs shall be primarily responsible for the implementation of the project at the village level. The reception cum interpretation centre built in each target village would be run and managed by these institutions.

An organization shall be engaged for providing handholding support to the communities for CBET development. The organization should form a CBET team, consisting of a Project Coordinator (at the state level) and team of project facilitators (at the cluster level), which facilitate the VPs in developing the necessary infrastructure at the village level. Moreover, they would also facilitate safety audits for the trek routes in and around each cluster.

Marketing shall be taken up by a specialized agency hired by the project as well as by a team of Marketing Executives employed through the project support. Moreover, a website shall also be developed for promotion and e-bookings. The project team shall also participate in tourism fairs and festivals at the national and local level for promotion. The project shall work closely with the Uttarakhand Tourism Department.

Bookings shall be done at a central level for all the clusters/villages. Subsequently bookings for each village would be referred to the concerned VPs. These organizations would welcome the tourists coming to their village and then facilitate their stay in the guest houses within the village. The room rent for guest houses would be received by VPs from the tourists.

After deducting a fee the VPs would give the balance amount to the owner of guest house. The project investment in the guest house would be recovered by the VPs through this fee.

(5) Project Activities

- Identification of clusters through a scoping exercise as well as from the results of micro planning.
- Identification of technical support agency to provide training to the community eco-tourism operators.
- Community organization in the form of SHG/BMCs in case of villages where there is no VP.
- Providing grant/facilitating loans and providing technical assistance to community members for developing guest houses, restaurant (5 guest houses and one restaurant in each village).
- Construction of one reception cum interpretation centre in each village.
- Capacity building of community including technical trainings related to guest house and restaurant management, cookery, cultural programmes and guides (they should be sent to short courses/ customized programs offered by reputed institutions/ college for hotel and restaurant management, even outside Uttarakhand).
- Development/improvement of nature trails, public conveyances and signage.
- Conducting safety audits for trek routes.
- Possibilities for promotion of adventure sports would also be explored.

- Establishment of a project website for e-marketing and e-booking.
- Hiring of specialized agency for marketing of the tourism circuits developed under this project.
- Participation in tourism fairs and festivals.
- Making sure the adoption of the measures for waste management at ecotourism sites in accordance with the existing guidelines in Uttarakhand.

(6) Technical and Facilitation Support

The project shall engage the services of specialized organization/ travel agencies who shall be responsible for establishing market linkages.

Table 6.6.7 Role of different Institutions for community based ecotourism activities

Activity	Responsible agency/institution	Remarks
Identification of clusters	DMU/FMU and CBET team	
Community mobilization	CBET team	
Formation of SHGs	CBET team	About 10 members per SHG
Capacity building of VP and SHGs	CBET team with the help of technical institutions	
Construction of reception cum interpretation centre	VP with the help of DMU, CBET team and technical institutions	One centre per village which would be managed by VP
Support for construction of guest houses, restaurants and reception cum interpretation centre	DMU with the help of technical institutions	5 guest houses and 1 restaurant in each village. The cost should be recovered by VP through the retention of payment to the guesthouse owners by the VP after the VP receives payment from the guests. The convergence should be sought for this with the other programs, bank financing or investment from private travel agencies.
Development/improvement of nature trails	DMU with the help of technical institutions	
Capacity building of guest house owners, restaurant owners, guides and cultural groups	CBET team with the help of Uttarakhand Tourism Department and other technical institutions	
Providing musical instruments, costumes etc.	DMU and CBET team with the support of technical institutions	In each village
Establishment of solid waste management facilities	VP and DMU	In each village
Marketing	Specialized agency and marketing executives with the support of Uttarakhand Tourism Department.	Centralized marketing.
Welcome to tourists in village	VP	These institutions would refer to tourist to individual guest house. They would collect the receipts and then give them to the guest house owners after charging a fee.

Source: JICA Preparatory Survey Team

6.6.5 Non-NTFP Based IGA

The bottle necks in livelihood activities include; 1) market information and access, 2) lack of technical information and guidance, 3) insufficient access to farm inputs, 4) small land holding, and 5) lack of time to be invested in livelihood activities. While the number of SHGs to be supported under the NTFP based IGAs would be limited to 480 SHGs approximately, Non-NTFP based IGAs will provide alternative livelihoods to nearly 1,520 SHGs. The potential IGAs are selected based on these criteria: 1) the activities that are already part of their livelihood but in need of support for improvement in

production technology and post harvesting technologies; 2) products that have potential for cluster development for enhanced economic viability; and 3) products with high market potential.

Although the IGAs will only be finalized after the scoping and market survey, dairy, poultry, spice cultivation and off season vegetable cultivation are identified as potential non NTFP based IGAs. Indicative number of SHGs that may undertake proposed IGAs is shown below. On an average INR 80, 000 per IGA is kept for financing non NTFP based IGAs in addition to the Revolving Fund of INR 50,000.

Table 6.6.8 Indicative number of SHGs for potential IGAs

Proposed IGA Activities	No of SHGs
Non NTFP based IGAs	
Improved Dairy	390
Poultry	130
Spice Cultivation	350
Off Season Vegetable Cultivation	350
Other IGAs	300
Sub Total	1,520
NTFP IGA	480
GRAND TOTAL	2,000

Source: JICA Preparatory Survey Team

(1) Improved Dairy

Dairy has been part of the traditional way of livelihood in the hills but due to the limited access to the market and the inability of dairy farmers to supply milk in bulk to the market, it has not taken off as an enterprise. Further, the shortage of fodder especially during the winter season has always been a problem. The project will provide technical guidance and alternatives for resolving these issues and improve the productivity of dairy sector amongst the project supported SHGs. SHGs engaged in the dairy will be supported to form a cluster in order for the effective procurement of inputs, marketing and access to technical services.

Fodder: This project will provide technical training for the SHG members in basic skills in dairy farming and provide fodder seeds/ seedlings that can be planted in the fallow land, if available. If the available land cannot be found in the community, the SHG may opt for fodder blocks that can be obtained from ULDB at a subsidized rate. The NGO ad-hoc expert will assess the availability of fodder and plan for the suitable fodder procurement and feeding methods.

Cluster Development: A cluster level organization will be encouraged to be formed. It can procure the feeds and other required materials, that can be distributed amongst the member SHGs and facilitate market linkages and access to the livestock health services. One or two members from 2 SHGs may also be given the charge of distributing the materials from the cluster level organization to SHG members. The purchased feed and fodder blocks can be sold to SHG members at subsidized rates and to the non SHG members at the regular rate. A part of the profit earned from the sale of these materials will be shared with SHG and the members in charge of distribution.

Link to the market: Milk will be collected at a collection centre established by cluster level organization. One person amongst the SHG members will collect the milk from the members and deliver to the collection centre. Transportation will be arranged by the SHGs or by the cluster level organization. FNGO Marketing Support Staff will facilitate the market linkage.

Managing production: One member will also be sent to be trained on livestock health and artificial insemination. This could be women but if not, an unemployed male youth can be sent to the training. The nomination of the trainee will be done by the consensus of the SHG members. The cost of training will be funded by the project. The trained service provider will offer regular check up of livestock and artificial insemination services at subsidized rates to the SHG members and will also provide the services to the non SHG members in the VPs at least for 4 years after the completion of the training. In this way the livestock health is ensured and production can be managed well. A part of the profit of the

service provider should also be shared with the SHG. In this enterprise, curd, cheese and butter milk can also be prepared and sold for profit.

(2) Poultry

Although poultry has been regarded as caste specific activity, the recent changes in the diet of the urban population have increased the market demand. Poultry does not require much land space and can be carried out by SHG members who are without access to land and yields high profit. In the case of Kroiler, it grows in 3-4 month time and will fetch the price of 200Rs/ kg of a grown bird. Though the consumption of the feed by Kroiler is quite high, the profit is enough to cover the cost of feeding.

However, the challenges in poultry include; 1) constant supply of the chicks, 2) regular procurement of feed, 3) access to the market and 4) technical support. Thus, the project will provide the training, regular follow up by the FNGO specialists and Marketing Support Staff. Cluster development shall also be facilitated by the project.

Linking with market: A vehicle will be hired by SHGs so that the matured birds can be collected by a SHG member who would deliver them to the market. The SHG members may have the tendency to sell the produce one by one to their neighbours but this should be avoided since if a sizable produces are to be delivered to the market, it will bring them better profit. Marketing will be facilitated by the FNGO Marketing Support Staff.

Supply of Chicks and Technical Guidance: Purchasing of the chicks will be done by the cluster. The chicks will be distributed to the members at the subsidized rate. FNGO specialist will provide the guidance in vaccination and introduce the feeding methods that will reduce the dependency on the purchased feeds. For procurement of chicks, convergence with Livestock Department may also be considered.

By-product: The technique to prepare manure out of droppings may also be introduced to support the farming activities among the SHG members and others. To assist the SHGs in marketing the produces and procurement of the feeds, cluster development can be promoted.

(3) Spice Cultivation

Spice cultivation has also been promoted by various projects. Spice and Ginger cultivation is suggested by the Survey Team. Other spices may also be selected by the FNGO Subject Matter Specialist after assessing the agro climatic condition, market price and demand and technical feasibility of cultivation. These can be cultivated on SHG members own land or on the hired fallow land. The prices of the produces are fluctuating and thus, to understand when to sell is important.

From 2nd cycle onwards, SHGs need to procure the farm inputs by themselves. A cluster level organization may be established for better access to market and farm inputs. For the procurement of farm inputs, exposure visits, farm infrastructures, convergence with Horticulture Board for Himalayan Region or Horticulture Department may be considered. The inputs such as bio fertiliser and seeds can be procured by a SHG or a multiple number of SHGs collectively and distributed to the SHG members. The inputs can be provided at the lower cost to the SHG members and can also be sold at the regular rate to non SHG members. This activity can be combined with off season vegetable cultivation for better profitability and stable income.

Promotion of farm yard manure and bio fertiliser: The project will encourage application of farm yard manure and bio fertilizers. The application of chemical fertilisers will be limited. Some SHGs may also consider introducing organic cultivation. Horticulture Board offers financial support for organic certification. However, the certification can only be obtained after 3 years of the application and thus, it will not bring immediate benefits to the SHG members. Though organic farming will have potential, whether to go for certification or not may be deliberated after considering the economic capacity of the SHG members along with other factors.

Marketing and Value addition: The produce will be collected at each SHG level and initially be marketed as a group. Marketing will be facilitated by FNGO Marketing Support Staff. Once the SHGs form a cluster, the marketing can be done on a cluster basis and may also consider value addition.

(4) Off- Season Vegetable Cultivation

Taking advantage of its climatic condition, hill region of Uttarakhand is known for production of off-season vegetables. The vegetables produced during the lean season in the plain area fetches higher price in the market. It is also feasible in the small and fragmented farm plot size as in the project area. Especially, capsicum is a highly profitable crop. Other vegetables like cauliflower and tomato can also be cultivated. The selection of the vegetables to be cultivated should be done according to the agro climatic as well as market conditions. FNGO ad-hoc specialist can also be mobilized in identifying suitable vegetables. A cluster may also be formed by the SHGs engaged in Vegetable cultivation.

Farm inputs: The farm inputs required for 2nd cycle onwards, SHGs will need to procure by themselves. The inputs should be procured as a group or a cluster of SHGs and can be sold to SHG members with the lower prices and to the non SHG members at a regular price. Use of bio-fertilizer and farm yard manure will be promoted.

Marketing and Value addition: With regard to capsicum, a contract of purchasing the produce may be arranged with the hotels and restaurants in tourist destinations or in urban centres as it is mostly consumed by them. In order to ensure effective marketing, necessary guidance will be given by the FNGO marketing support staff and ad-hoc expert. Once the SHGs constitute a cluster, the marketing can be done on a cluster basis and may also consider value addition.

(5) Other IGAs

The project will facilitate SHGs to select their own activities taking into account their economic conditions and available resources (i.e. small/ no areas of productive land; locally available resources and skills); the interest of the SHG members and market demand. The FNGO marketing support staff and Field Coordinator will support the SHGs to carry out the survey exercise and business plan development. They may also wish to adopt the model business plans that will be prepared by the project. Those activities may include the handicrafts using pine needle, block prints, basket making, woolen felt crafts, bakery unit, solar mobile charging stations etc. Various training opportunities are available through Khadi & Village Industries Board and other organisations. Thus, such opportunities will be taken advantage of. The FNGO marketing support staff, ad-hoc specialist and Field Coordinators will support the convergence and will provide handholding.

6.7 Analysis on Proposed Other Support Activity

6.7.1 Capacity Building of Executing Body and Other Concerned Agencies and NGOs

Capacity Building of the executing body and other concerned agencies and NGOs is critical in ensuring the project implementation. The training needs have been identified in the DPR. The learning needs of the executing agencies have been confirmed through the survey. Each training session will be structured to accommodate the learning needs of the participants as each set of participants will have varying level of learning capacity and thus require the training methods to be adjusted accordingly to maximize the learning efficiency of the participants. The proposed training programmes for Executive body and NGOs are as below.

(1) Executive Body

1) Training

Various project evaluations have established that sound capacity development strategy has direct bearing on achieving desired results for any project, and is key to efficiently implement the project activities following envisaged processes. Thus, comprehensive training plan would be drawn by the PMU during first year of operation with support from PMC for undertaking systematic capacity development in desired areas identified through need assessment exercises. Thus, project will follow a well-defined capacity development strategy to achieve project objectives/ goals and to capacitate stakeholders for effective project implementation.

A combination of training methods including orientations, training, workshops, study tours and exposure visits (outside state and overseas), refresher training, field support and guidance by experts and NGOs, preparation of guidelines and manuals/ standard operating procedures should be adopted to capacitate the project staff at all levels. These training and exposure visits would also be planned for Circles/ Zones officials as required. Some of the key training areas/ topics are suggested in the table below:

Table 6.7.1 Key areas of Training for Personnel at the Executing Agencies

Training Subject	
Orientation	Financial Management and Accounting System (FMAS)
SMC Measures	Livelihood and Forest/ Sustainable Harvesting
Project Management/ Operation manual	Communication & Facilitation Skills
Micro Planning/ Composite Management Plan	Training of Engineers from Government Departments on Disaster Resistant Construction Method
Financial Management and Accounting	Community Disaster Preparedness
M&E Various Tools and Guidelines	Analysis and Reporting
GIS & MIS	Environmental and Social Safeguard

Source: JICA Preparatory Survey Team

(2) National-level Experience Sharing and Cross-learning Workshop:

One-time national workshop would be organized by PMU inviting key stakeholders from JICA supported projects in India along with key Project Staff and representatives of State/ Government of India (GOI), other externally-aided project, donor agencies, NGOs etc.

(3) Overseas Study Tour

The project will carry out overseas study tours for PMU and DMU officers. The aim is to learn lessons from community based forest management in other countries. The officers participating in the overseas study tours must work with the project for at least 2 years after the completion. The destinations for the study tours shall be revisited at the early stage of the project after reviewing the learning requirement of the participants.

(4) Capacity Building for NGO Staff

The project will engage FNGOs for implementation of the field activities. However, the orientation programs for them were not proposed in the DPR. The capacity building of the FNGOs is critical as they will be the vital vehicle for project implementation. They need to be given sufficient orientations in the project modality such as the procedures of micro planning of VPs, selection of Entry Point Activities, formation of SHGs and their management and record keeping, monitoring and etc. The orientation program for the NGOs needs to be carried out upon mobilization of such organizations. Furthermore, the FNGOs will be given trainings on project specific methods of implementation.

6.7.2 Improvement of Infrastructure, Equipment and Mobility of Executing Bodies

Based on the information collected mainly through a questionnaire developed by the JICA Survey Team the followings components should be included in the project:

(1) Office Infrastructure Improvement

A well-planned headquarters building is under construction, and a fully equipped new PMU building can be constructed under this project. Nearly 1,000 m² may be required for new PMU building. The land may be available for the building. This building is expected to be commissioned in next 1-2 years and during such period the PMU would operate from a rented premises.

DMU Office will be situated at each DFO Office. All the project divisions are having office buildings and the space is sufficient for the current staff strength. Four (Programme Coordinator, Accounts Officer, MIS assistant and Computer Operators) more staff are to be recruited to undertake the project

activities at DMU level. The existing forest project divisions will be extended or newly constructed to secure an average of maximum 75 m² for each DMU Offices (a total of 13 DMUs). No land acquisition will be required for the building extensions. The newly extended building will be utilized by the new recruited staffs and would serve as meeting place for the project staffs or VP members.

In addition to the DMU to be created under the project, **6 Forest Divisions** will be included for the sediment disaster mitigation component as:

- a. Uttarkhashi Soil Conservation Division (Non-Territorial)
- b. Uttarkhashi Forest Division (Territorial)
- c. Rudraprayag Forest Division (Territorial)
- d. Badrinath Forest Division (Territorial)
- e. Bageshwar Forest Division (Territorial)
- f. Pithoragarh Forest Division (Territorial)

Among the 6 divisions listed above, 4 divisions (Uttarkhashi FD, Uttarkhashi SC, Rudraprayag FD, Badrinath FD) are not covered under other project components, thus the DMU will not be created for these 4 divisions. However, mobility, equipment and additional contractual staff members will be provided for the implementation of disaster component.

FMU Office will be situated at each Range Office. The existing Range Office buildings have office building but not sufficient for even existing staff strength. There will be four (Assistant Range Project Officer, Accountants (2 persons) and Computer Operators) more staffs are to be recruited to undertake the project activities at the FMU level. The existing Range Office buildings concerned will be extended or newly constructed to secure an average of maximum 80 m² for each Range Office (a total of 37 FMUs). No land acquisition will be required for the building extensions. The newly extended building will be utilized by the new recruited staffs and would serve as meeting place for the project staffs or VP members.

(2) Mobility

Mobility support for PMU, DMUs and FMUs is suggested, details of which are depicted in the table below:

Table 6.7.2 Proposed Vehicles to be procured for PMU and DMU

Sl. No.	Type of Vehicle	PMU (1)	DMU (13)	Additional Division (for disaster component)	FMU (37)	Zone/ Circle (2+6=8)
1.	Car/ 2 wheel drive SUV	6	0	0	0	0
2.	4-wheel drive	6	13	4	0	8
3.	Jeep/ Pick-up Van	0	13	4	0	0
4.	Total	12 vehicles	26 vehicles	8 vehicles	-	8 vehicles

Source: JICA Preparatory Survey Team

Option of hiring four wheelers on rent could also be considered. At the FMU level, the fund for hiring vehicles is allocated in the budget.

(3) Equipment/ Furniture

PMU, DMUs and FMUs would be provided with necessary equipments to facilitate functioning of newly established offices as depicted in the table below:

Table 6.7.3 Proposed List of Equipment and Furniture

	Type of Equipment	PMU	DMU	Additional Division for Disaster Component	FMU	TOTAL
1.	Desk-top Computers	11	26	8	37	82
2.	Notepad/ Laptop	11	13	4	37	65
3.	Laser printer (Color, B/W)	11	0	0	37	48

	Type of Equipment	PMU	DMU	Additional Division for Disaster Component	FMU	TOTAL
4.	Multi-function Printer	1	13	8	0	22
5.	Digital Photo Camera with GPS	2	0	0	37	39
6.	Video Camera	2	0	0	0	2
7.	Projector	1	0	0	0	1
8.	Video Conferencing gadgets	1	0	0	0	1
9.	AC (Split/ Window)	10	0	0	0	10

Source: JICA Preparatory Survey Team

Office furniture and fixtures at all project offices viz., PMU, DMUs and FMUs including VPs offices would be supported.

(4) GIS Infrastructure Development

Geographical Information System (GIS) encompasses survey, mapping and analysis aspects in planning, monitoring and evaluation of activities and project interventions. The geographical database once created and regularly maintained and updated as per the defined requirement to achieve the goals and objectives, would assist in effective project implementation and act as a decision support system for the organization.

Under the JICA project the utmost objective of having a good GIS infrastructure is to assist the project in effective planning and monitoring, and timely decision making.

1) Strengthening of Existing GIS Laboratory

UKFD is having a GIS laboratory at UKFD HQ in Dehradun. As the unit has permanent and contractual staff working under the supervision of the GIS laboratory in charge and thus there is no space to accommodate the additional staff and hardware. To accommodate the proposed staff under the project and the hardware, it is better to have a separate GIS unit under the project which will be an extension of the existing GIS Unit of UKFD.

2) Procurement of Equipment, Computer Hardware and Software

Under the project, GIS hardware and software would be procured to establish GIS based planning and monitoring system. A detailed list of Hardware and Software items to be procured is given in the table below:

Table 6.7.4 Suggested List of Equipment to be procured by the Project for GIS Laboratory

Item	Specification	Unit	Qty
Server	High End Server	No.	1
Workstation	Qua Core, 3.20 GHz Turbo, 16GB DDR Memory	No.	2
Desktop Computer	Intel Core i7, OS Microsoft Windows 7	No.	3
Plotter	A0 size	No.	1
Scanner	A3 size	No.	1
Printer-Deskjet	Deskjet/Inkjet; A3 size	No.	1
GPS	Handheld	No.	50
Inverter		No.	1
Image Processing Software	Erdas Imagine Professional	No.	2
	Erdas Vector	No.	2
	Erdas Virtual GIS	No.	1
	Erdas Auto Sync	No.	1
GIS Software	Geomedia Advantage	No.	2
SQL Server		No.	1
Visual Studio Professional	Version 2012 (VB.net)	No.	1
Anti Virus	Two 3 User Licenses per Year for 8 Years	No.	48
MS Office with Access		No.	5
PDF Editor		No.	2

Item	Specification	Unit	Qty
Printing of Maps		LS	1
FSI Forest Density Map Procurement	2013, 2015, 2017, 2019, 2021	No.	5
Other Data (Soil, Geology)		LS	1
Web GIS Server Application/Software	Intergraph Geospatial Server	LS	1

Source: JICA Preparatory Survey Team

The equipment, computer hardware and software would be mainly required for survey, base layer preparation, geo-referencing of maps, input GIS and satellite data processing, map scanning, data quality checking, data analysis, preparation of thematic maps, map printing, data repository, data security and GIS-MIS integration etc.

6.7.3 Capacity Building of Van Panchayat and Other Community Based Institutions

(1) Van Panchayats (VPs)

Once the project begins, project specific topics need to be included. The relevant training programs should be designed and conducted in view of required knowledge and skill for project implementation. The mode of training delivery should be interactive and participatory rather than the lecture mode. In the training program, project specific skills/ subjects are required to be incorporated. The modules should be designed in small capsules and training locations should be as near to the VP areas as possible. The suggested topics to be included in the program are as below. Amongst the participants, animators and member secretaries must be included. The training will be conducted by FNGO Field Coordinators at FMU level. The training should be carried out with all the VPs and refreshers/ follow up training will also be conducted. Exposure visits will be planned for VPs. The training schedule will be prepared before the completion of the selection of VPs of each batch in consideration of the implementation schedule of eco restoration activities and micro planning. The training will be spread across the year and avoid the rainy season or peak season of the farming activities.

Table 6.7.5 Table Preliminary Training Contents for VPs

Topics	
<ul style="list-style-type: none"> ■ Van Panchayat Rules and sustainable forest management ■ Eco-restoration, model estimate preparation and area mapping ■ Micro-planning and Action Plan ■ Participatory methods and tools ■ Monitoring/ Evaluation ■ Decision Making ■ Leadership and Conflict Resolution ■ Fund Management and Bank operations 	<ul style="list-style-type: none"> ■ Accounts and Auditing and Record keeping ■ Data management, report preparation and communication ■ Function as Micro-finance Institutions for SHGs and Business Plan evaluation ■ Sustainable Forest Resource management ■ NTFPs – Sustainable harvesting, post harvest handling and marketing ■ Man animal conflict ■ Role of Animator and Member Secretary in VPs

Source: JICA Preparatory Survey Team

(2) Strengthening of Van Panchayat (VP)

The VPs need technical, legal, managerial as well as financial capabilities to effectively carry out their mandate of Panchayat Forest management. The overall approach for capacity building of VPs would be to holistically address the issues related to VP institution. Learning on-the-job through coaching, guiding, participation, facilitation should play a greater role than learning in class room environment. The focus should be on experiential and practical learning through facilitation than formal training.

Apart from the provision of training programs, various areas of VP functioning and management also need to be strengthened as summarized below:

- a. Some VPs needs to be constituted properly – Sarpanch should be known; area of VP needs to be mutated in revenue records; Panchayat forest must be demarcated properly, marking of boundaries should be put on the ground, and a map should be available with VP.
- b. In some of the VPs the elections are overdue. Before starting the work in such VPs, it should be ensured that elections are duly conducted, in consideration of social safeguard for weaker sections of the society.
- c. VP Inspectors from the Revenue Department and VP Member Secretary from the Forest Department should visit the VP at regular intervals as indicated in the VP Rule. Appropriate concrete mechanism at Revenue Department and Forest Department level need to be made, maybe through the issuance of Administrative Order by the Government, to ensure that the concerned officials regularly visit the VP.
- d. The case of decision making on operational & financial aspects limited only to Sarpanch and Member Secretary should be avoided, and the democratic, inclusive and transparent decision making procedures at the VP level should be established as suggested in the M&E section of this report.
- e. Since the women are the primary users of forest, their role in most of the VPs should be primary. Active women's group in the village such as Mahila Mangal Dals should be encouraged to get involved with VP matters.
- f. Small size of Panchayat Forest is the constraint for sustainable forest management, so the areas of CS Forest and Reserve Forest adjoining the VP areas may be brought under the management of VP and duly notified as VP through the consultation with concerned authorities.
- g. Focus of micro plan to be on the whole Panchayat forest area, not only the treatment areas.
- h. Audit of VP account should be completed as per the provision for the same in VP Rules.

(3) SHGs

SHGs are proposed to be formed or revived under VPs to undertake the income generation activities that could provide them alternative means of earning income and financial stability. At the initial stage of the formation of SHGs, the capacity development programs to enhance group cohesion, record keeping skill, literacy programs will be carried out for both NTFP and non NTFP based SHGs. As they mature as a group, the training programs will cover the topics such as financial and business management in addition to required technical knowledge to undertake IGAs as per their requirement. The suggested training contents are shown in the table below. For the specialized skills training will be provided by the specialized organizations deployed by the project or by the NCE. Exposure visits will also be conducted for SHGs.

Table 6.7.6 Preliminary Training Contents for SHGs

Training Programs	Modules	Trainers
Foundation Training	<ul style="list-style-type: none"> ■ Understanding SHG ■ Purpose of forming SHG ■ Functions of SHG 	<ul style="list-style-type: none"> ■ FNGOs
	<ul style="list-style-type: none"> ■ Group Savings/ Internal Lending ■ Financial Record Keeping 	
Business Management Training	<ul style="list-style-type: none"> ■ Understanding Market ■ Business Planning 	<ul style="list-style-type: none"> ■ FNGOs ■ Other relevant organisations engaged by NCE
	<ul style="list-style-type: none"> ■ Financial Planning and Management – Loan ■ Managing an Enterprise ■ Production Planning ■ Keeping Inventory ■ Monitoring the market condition 	
Skills Training	<ul style="list-style-type: none"> ■ Skills Training 	<ul style="list-style-type: none"> ■ Field NGO Experts ■ Other Organisations engaged by NCE

Source: JICA Preparatory Survey Team

(3) Animator

The DPR proposes to engage an educated, young and unemployed villager per VP as Animator. S/he will be trained under the project and will help the administration of VP, such as record keeping, baseline survey, progress monitoring, coordination with various agencies for convergence and other requirements under the project. Animator will also assist the formation/ re-vitalization of SHGs for IGA activities and support the record keeping of SHGs as well. He/she will take part in the training programmes designed for Animators and in the exposure visits. S/he will be guided by the project staff and FNGOs. The animator honorarium will be funded by the project for 3 years.

The suggested selection criteria of Animator are:

- a. Must be a resident of the VP
- b. Class 12 or above
- c. Knows reading and writing in Hindi (some knowledge of English is preferred)
- d. Nominated by the General Body of VP

6.7.4 M&E and OVIs

Monitoring and Evaluation (M&E) is a mechanism to assess whether a project is achieving its targets, objectives and goal while it is being implemented. M&E being integral part of project management will require adequate resources, budget, institutional capacity, clear institutional responsibilities, and reporting mechanisms. It will be important that the PMU builds capacity of project staff and create incentives to collect, use, maintain and analyze data for monitoring and evaluation.

(1) Overall Framework

The focus of the project M&E system will be on (i) to track project activities processes and progress, (ii) identify what is working well and what is not, and thus help management for decision making and apply corrective measures during the course of implementation, (iii) evaluate the performance of activities and various institutions, and (iv) estimate project impacts and results on-the-ground and document lessons learned that could be used in future project implementation.

The key principle for M&E system design would be to bring in transparency and accountability during the course of implementation.

M&E will emphasize stakeholder participation and be designed to facilitate rapid identification of shortcomings and problem areas and facilitate mid-term corrections, where necessary, to project design and/or implementation arrangements to ensure that the project meets its goal and objectives.

PMU will regularly monitor and report the physical and financial inputs and outputs of project activities. To facilitate this, PMU will deploy a full-time senior forest officer having relevant experience and skills in monitoring and evaluation, and recruit IT professional having experience in MIS and GIS systems. PMU would procure all relevant resources and strengthening MIS/ GIS laboratory for the project purpose. The responsibility to manage and analyse data generated during project implementation would be with the MIS/ GIS laboratory.

PMU will coordinate with the DMUs, Zone/ Circle offices, NCE, PMC, support organizations etc. in monitoring the activities on day-to-day basis. DMUs would further coordinate with FMUs, NGOs to keep track of the project implementation. VPs/ BMCs would also be involved for monitoring and reporting activities at the local level. The representatives from various community institutions will be trained to use simple tools to monitor project progress and impacts and discuss implications.

PMU will develop and use web-enabled management information system (MIS) to consolidate and manage primary data reported by various implementing units, and data received from the various other agencies. The MIS software would have feature to integrate data with GIS for undertaking spatial

analysis. In addition, PMU will also adopt computerized Financial Management and Accounting System (FMAS), and use it for efficient management of funds and generating statement of expenditures at all operational levels. Data will be used to update the indicators of the project to input into the monthly, quarterly, and annual progress reports. Use of GIS and other modern information tools will help collate, compare, analyse, and visualize the information.

(2) Reporting requirement

PMU will prepare quarterly reports and furnish to JICA to apprise on the project implementation, and will also publish annual report along with updated project implementation schedule after getting approval from the Governing Body at the completion of each fiscal year. The reports will be available both in print forms as well as in digital form to facilitate further information dissemination. The reports will also be accessible through project website.

PMU will develop templates for both quarterly and annual reporting during first year of project initiation in consultation with PMC, and if necessary organize workshop to finalize reporting templates and/or obtain concurrence from JICA. These reports will include: (a) physical progress and financial expenditure by components/ sub-components against annual plan along with analysis, tables, photographs and graphs to support claimed achievements; (b) project performance indicators; (c) problems/ constraints encountered during the reporting period, with suggested remedial actions, (d) observation and recommendations of PMC and; (e) socio-economic and environmental impacts of the project³.

Annual Action Plan (AAP) will be prepared for each fiscal year. PMU will get the plan approved from High Power Committee (HPC) by March and would share with JICA for information by April every year. PMU will establish a system of preparing demand responsive annual plan and provide necessary guidance and support, and will regularly follow-up to get it compiled in time. Preparing demand responsive annual plan would require capacity development of the project staff and institutions at each operational level, and PMU would ensure to provide necessary training for that purpose.

Table 6.7.7 Reporting requirement at various level

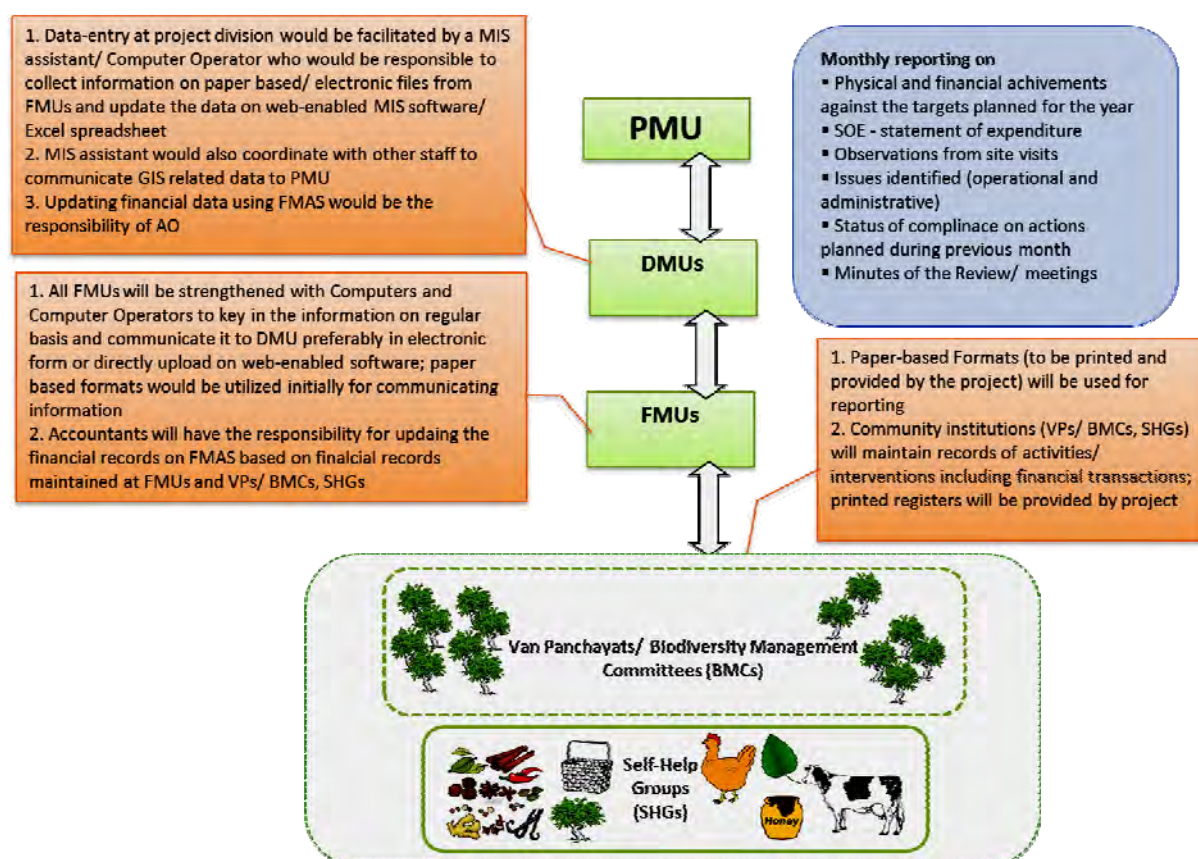
Type	In Charge	Submit to	User	Remarks
Annual Report	PMU	GB	UKFD, HPC, GOU, GOI, JICA	<ul style="list-style-type: none"> ▪ Achievement (physical and finance) and status against the annual plan ▪ Performance indicators, Social and Environment Safe guards ▪ Problems and constraints ▪ Photographs, graphs etc. ▪ To be uploaded on web-site and kept in public domain
Quarterly Report	PMU	JICA	GB, HPC, GOU, JICA	<ul style="list-style-type: none"> ▪ achievement (physical and finance) and status against the annual plan ▪ Problems and constraints ▪ Photographs, graphs etc.
Monthly Reports	DMU	PMU	PMU, Zone, Circles	<ul style="list-style-type: none"> ▪ achievement (physical and finance) and status against the annual plan ▪ Problems and constraints ▪ Photographs, graphs etc.
Weekly Reports	FMU	DMU	DMU	<ul style="list-style-type: none"> ▪ achievement (physical and finance) and status against the annual plan ▪ Problems and constraints
Statement of Expenditure (SOE)	PMU	JICA	JICA/ CAAA	<ul style="list-style-type: none"> ▪ Financial Reporting against the annual plan consolidating expenses at VPs/ BMCs, FMUs, DMUs and PMU level ▪ The SOE to be prepared based on the entries made in the FMAS module

³ Section (e) to be included in annual report only referring the Environment and Social Safeguard Plan (refer Table 7.9.1 Output and Process Indicators for Safeguard, Monitoring and Evaluation in Chapter 7) under the project

Type	In Charge	Submit to	User	Remarks
Annual Action Plan	PMU	HPC	PMU, DMUs, FMUs, GB	<ul style="list-style-type: none"> Planning activities as per Project implementation Plan, Plan for backlog/ delayed activities, and Strategy; this plan would incorporate the annual plans of VPs/ BMCs drawn out of the Micro-Plans
Field Visit Report	By visiting officers	-	All concerns	<ul style="list-style-type: none"> Identifying the issues and make observations on the project implementation progress vis-à-vis Annual Action Plan

Source: JICA Preparatory Survey Team

The information would flow back-and-forth from lowest operational level to the PMU, and will be utilized to generate reports indicated in previous section. Figure below illustrates the flow of information and its uses at different level of operations.



Source: JICA Preparatory Survey Team

Figure 6.7.1 Information flow and Reporting at different operation levels

(3) Elements of M&E System Design

Systematic M&E will be carried out under the project to monitor performance of the project interventions, and to ensure that lessons learned are used throughout project implementation. M&E system will have following eight key elements, and PMU would ensure to put the system in place.

1) Rigorous monitoring and reporting by multi-stakeholders

Rigorous and regular monitoring would be the key approach to bring in transparency and to efficiently track the project implementation. Day-to-day monitoring and reporting would be undertaken from lowest level (i.e. VPs/ BMCs) to the state level. Key levels where the progress would be tracked are – VP/ BMC, FMU (Range), DMU (Divisions), Circles, Zones and PMU (Headquarters), and stakeholders that would be interested and regularly keep track of the project implementation are – VPs/ BMCs, forest department, state govt. and GoI, JICA, PMC, Survey Agencies.

Monitoring will include monitoring progress (if activities have taken place), process (if requisite processes were followed, particularly working with community e.g. did the consultation take place, who participated etc.), outcomes and impact including monitoring safeguards framework relate to vulnerable groups, eco-restoration etc. Following would be the frequency of monitoring by various stakeholders:

Table 6.7.8 Monitoring Frequency and Groups Involved

Frequency of Visits and Reviews	Stakeholders
Weekly	FMU, NGOs, VP/ BMC members
Fortnightly	FMU, NGOs, Programme Coordinator
Monthly	DMU,
Quarterly	Zone/ Circle officers, PMU officials, DAC members, Governing Body members of PMU
Six-monthly	HPC members, JICA representatives

Source: JICA Preparatory Survey Team

In its initial years of operation PMU would work on developing reporting formats to capture the information. A set of performance indicators would be identified and would necessarily be updated on annual basis. In addition PMU would develop and publish guidelines and manual on M&E methods and tools.

2) Social Audits and Self-Monitoring by Community/ Target Group

To capacitate the VP and BMC members/ community in planning, monitoring, decision making and to bring in transparency in the processes a system of annual social audits would be in place. This one-day event would give an opportunity for all members to know about the project activities and raise voice, especially ST, SC, women, landless and other weaker sectors of society, while Management Committee of VP/ BMC shares all the records, proceedings, achievement vis-à-vis annual plan, accounts, expenditure, wage-payment details, etc. in public. Other stakeholders including representatives of Gram Panchayat, Project staff, UKFD, Revenue Department, NGOs etc. would also participate in this event. Community institution representatives/ members and project staff at field level will receive training in these aspects.

Proceeding of the Social Audits would be compiled by VP/ BMC management committee with assistance from Animator and NGO staff, and would submit the a copy of the same to the concerned FMU, DMU and PMU highlighting action to be taken by respective stakeholders on identified issues.

System of self-monitoring based on the annual plans and reporting would also be in place at VP/ BMC level. Simple participatory tools would be developed in guidance from PMU/ DMU and PMC for generating performance reports based on actual achievements. Quarterly performance Report Card of each VP/ BMC would be displayed at FMU level that will be based on a simple rating system (i.e. using color code for rating). A caution is required that such a system should get evolved by community themselves rather than be project-driven. To ensure that it happens initial hand-holding and capacity development on participatory M&E tools and processes, both for community representatives and project staff, would be required.

3) Statutory Financial Audits and Internal Audits

Project would provide support to undertake annual financial audits of the funds provided to various implementing agency during the financial year. Separate bank accounts would be opened for VPs/ BMC, DMUs (Divisional), FMUs (Range) and PMU (state-level) and would be annually audited by qualified and reputed auditors. In addition, the audit by the Auditor General of the State Government will be done as per the government rules.

Beside six-monthly internal audits by Chartered Accountants engaged by the project at PMU will audit the accounts of DMUs and FMUs to keep close track of funds and its utilization, and also capacitate various project offices to maintain systematic and proper records.

4) Grievance Redressal

During the implementation there may be instances where there are disagreements and dissatisfactions at the implementation level. There would be two opportunities to place the grievances for adequate solutions viz., a) Monthly hearing at Circle/Zone offices, and b) Annual sharing during Social Audits. Proper records of the applications received on grievances in the office of Circle/ Zone and VP/ BMC would be maintained and status would be entered in the Grievance Register after each monthly hearing. The grievances can be expressed through the project structure at any point and could be reported through the project structure (VP/ BMC-FMU-DMU-PMU) anytime.

Now, Right to Information Act (RTI) has created additional opportunities for enhancing transparency and accountability. Thus, project will make efforts to enhance disclosure of information and facilitate NGO/ civil society partnership resulting in increased responsiveness. The key elements of strategy that PMU would work on must include:

- a) Enhance disclosure of information utilizing project website;
- b) Facilitate NGO/ civil society involvement for project implementation for social intermediation and other support
- c) Develop a credible system to handle comments, suggestions and grievances
- d) Define clearly incentives and remedies available
- e) Develop monitoring indicators for compliance to the above

5) Annual Planning & Review Workshops

In order to ensure the appropriate budget allocation and utilization, collective and bottom-up planning method will be adopted by the project. This will ensure the accountability of each concerned officers involved. A series of workshops would be organized annually at Division and State-level; at divisions it would be one-day event and at state it would be two-day event. PMU would be responsible to organize state level annual workshop every year, and would also follow-up with the DMUs for proposing Divisional Annual Planning and Review Workshops.

Responsibility to organize this annual event at divisional level would be with Divisional Project Officer (i.e. DFO). These events would be planned during February/ March (as per climatic conditions) in which representatives of VPs, SHGs, NGOs, project staff (FMUs and DMUs), would participate.

The event would be chaired by Circle/ Zone heads. Circle/ Zone heads would review the annual progress. Representatives of DMU and FMU offices would also make brief presentations on achievements vis-à-vis plan. Performing VPs/ BMCs and SHGs would share their experiences and achievements vis-à-vis annual plan based on Micro-Plan. Workshop will also discuss plans for next financial year, and would take inputs for preparing annual plans.

6) Baseline Survey, Mid-term & Terminal Evaluations and Impact Assessment

Two set of baselines would be created prior to initiating interventions viz., a) socio-economic, and b) physical situations of the project areas. Information from representative target groups and project areas on identified parameters and variables would be collected by a qualified and reputed agency aggregated by gender, poverty status, caste category etc.

Baseline surveys will be undertaken in collaboration with the project units/ UKFD to collect primary data on the key project indicators and methodology agreed with PMU. Randomized sampling design will be followed for project sites/ areas or target group selection. Baseline will also capture situations in control villages/ sites for making comparisons during evaluations exercise.

The baseline should include certain safeguard aspects, and stratification and data collection should consider various characteristics of the society, especially the vulnerable groups.

This baseline data set would be utilized for the Mid-Term Evaluation in the 4th year (i.e. 2018-19) of implementation and during Terminal Evaluation (2021), as well as for future comparisons to know the

performance and impact of the project investments during Impact surveys to be undertaken towards end of project implementation.

Short studies would be undertaken as and when required to understand the issues and impact of certain interventions/ processes

7) GIS for spatial analysis

PMU at state-level would be strengthened for undertaking GIS operations. All the project sites and treatment areas would be geo-coded and would be translated on digitized maps for analysis.

It would be important to record geographical location (GPS based coordinates) of each individual asset created under the project for closely monitoring of the work progress. Location specific inventory of assets would be created to better manage the assets in future.

The GPS based surveyed location coordinates for all interventions would be plotted in GIS and eventually be utilized as one of the input for integrating GIS with MIS, and for undertaking spatial analysis.

High resolution satellite images would be procured for the project areas to ascertain the impact of the project interventions and for comparative analysis. Cartosat-1 and LISS-IV Mx high resolution satellite images of Indian Remote Sensing series would be procured in 2014-15 and 2019-20 period. Cartosat-1 images are black and white images with a spatial resolution of 2.5 meters and LISS-IV Mx area multi-spectral satellite images with a spatial resolution of 5.8 meters. The two datasets need to be merged to create colored 2.5 meters resolution images that would help in better interpretation accuracy.

The field based GPS boundary data would be overlaid on these images to prepare large scale 'image maps' and would be utilized by the field staff for planning and monitoring purposes. A copy of the same would be kept at respective VP well.

These high resolution satellite images would also be analyzed in relation to the detailed field based inventory and stock assessment to be done within the defined "sample plots" in the project areas. The field based assessment would be extrapolated using satellite derived indices to ascertain the available stock. The sample plots would be again visited during year 2019-20 for stock assessment and the two date data would be compared to assess the change. The values would be used to assess change in the available stock as well as carbon sequestration during the period. The list of images to be procured under the project is shown in the table below:

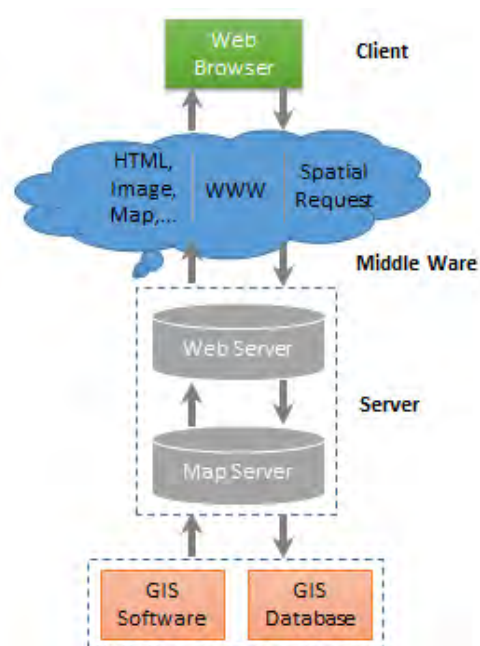
Table 6.7.9 List of Suggested Satellite Images to be procured under the Project

Item	Specification	Unit	Qty
Land Use/Cover Mapping (Outsourcing)	Procurement of ASTER (100%- for Year 2020) For entire state	no.	35
	Interpretation Cost	LS	1
VP's GIS Mapping using High Resolution Images (Outsourcing)	Cartosat-1 for Project Sites (2015)	no.	60
	Cartosat-1 for Project Sites (2019)	no.	60
	LISS-IV for Project Sites (2015)	no.	50
	LISS-IV for Project Sites (2019)	no.	50
	Data Merging (2015)	LS	1
	Data Merging (2019)	LS	1
	Digital Interpretation/Digitization (2015)	LS	1
	Digital Interpretation/Digitization (2019)	LS	1

Source: JICA Preparatory Survey Team

Forest Survey of India (FSI) comes up with detailed forest density based data every 2 years. The data provides the information about the tree cover (within and outside forests) only and thus changes happening in non-tree cover classes cannot be effectively analyzed. Since the project intervention areas under the JICA project will be largely located outside Reserve Forest, thus it becomes necessary to assess the changes in land use/cover within forest as well as non-forest categories as well. The project would buy 2 date satellite images (satellite images prior to 2014 and after 2018), one set in the beginning of the project and another set at the time of completion of the project for the entire state. The work would be outsourced to a specialized agency that would be doing the mapping part as well as comparative analysis.

The Web based GIS applications are a means to share geographical data to end users without GIS software. This would enable the end users to upload, view, query and print the map data using their existing web browser. Under the project Web based GIS application would be developed to enable end users to learn and use the GIS enabled data for planning and monitoring purpose. This would help in institutionalizing the usage of GPS and GIS technology.



Source: JICA Preparatory Survey Team

Figure 6.7.2 Web-based GIS applications

8) Computerized MIS and accounting system (Financial Management and Accounting System) for real-time reporting

Web-enabled MIS would be developed for capturing the progress and achievements on day-to-day basis. MIS will be planned till range-level from where the data would get integrated upwards. This would be done in phased manner. Paper-based formats would be used to capture information at VP/ BMC and SHG level. The output reports generated by the system would give status of project performance.

Software will be developed with-in first year of project initiation by PMU. Specialized technical agency could be engaged to design and implement a web-based project monitoring system, but the agency would place their staff within PMU to develop MIS software modules in day-to-day consultation with PMU. At the same time agency would also have mandate to provide technical back-stopping during the operational phase of the MIS system. Training manual would also be

developed by the agency for the MIS software prior to commissioning, and will be used to train the project staff at all level of operation.

Financial and accounting policies for the project will develop and will be documented in form of Financial Management and Accounting

Manual. These policies will be fundamental for maintaining

transparency, providing clarity regarding financial aspects to the various stakeholders and finance staff, ensuring uniformity, and enforcing accountability. All units of operations will comply with the financial and accounting policies of the project indicated in the Financial Management and Accounting Manual approved by HPC and adopted by the project.

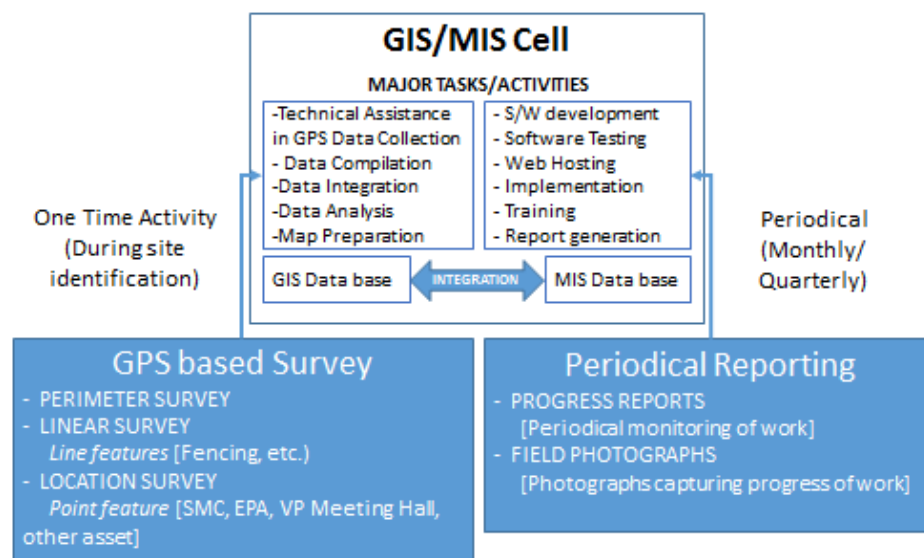
Computerized accounting system (FMAS) based on standard accounting software would be utilized for maintaining financial records from PMU till FMU (Range-level) for real-time reporting. The accounting software would be customized and adopted for financial management, tracking disbursement as per annual plans and efficiently compiling Statement of Expenditures (SOEs) for submission to JICA, state government, and Central Aids, Accounts and Audit Division (CAAA) under Ministry of Finance, Department of Economic Affairs.

All levels (PMU, DMU, FMU) would be strengthened both in terms of equipment/ connectivity and human-resources to implement the plans. Systematic training would be planned for all key staff at different levels to handle and utilize these softwares for maintaining records and generating reports.

Since the information can be efficiently extracted and easily understood with the help of maps, thereby it becomes necessary to establish a simple system for integration of information from MIS with GIS. Under database level integration tables need to be designed systematically for a common database during the initial stage itself keeping in mind the ultimate compatibility and integration of MIS data fields and spatial GIS database.

9) Information sharing through Project website and publications

User-friendly project website would be developed to share project progress and achievements. Monthly newsletter would be published both in digital as well as print form to display the project activities, events and success stories/cases. Annual Plan and Annual Reports would be published and shared in public domain. In first year of the project initial PMU would evolve comprehensive IEC strategy and would utilize the funds under the sub-component to implement the same over remaining project period. Besides, placing Transparency Board on the wall of VP office building, photo documentation, video clips and short films would also be prepared to capture pre and post intervention situations, views of the community and showcase successes.



Source: JICA Preparatory Survey Team

Figure 6.7.3 Database Management and Information Generation

(4) Operation and Effect Indicators and Project Design Matrix (PDM)

While tracking the physical and financial progress on an on-going basis would be a critical project management requirement, monitoring the project progress towards the project development objectives and sustainability dimension of the project intervention would be of immense strategic importance.

Continuous monitoring and assessment is required in the project areas, which spreads over 13 project division of the state, to have the basis for evaluation of the effects of the interventions towards end that perhaps may produce substantial measurable results. Eco-restoration and biodiversity conservation is an adaptive management process that requires evaluations of social, economic, and ecological conditions and trends that contribute to sustainability and that, therefore, reflect progress towards the project goals.

Project Design Matrix (PDM) provides a framework for effective and efficient project implementation. It summarises the project activities, outputs, project purpose as well as the long term goal as it is known as overall goal. PDM will also prescribe specific indicators and means of verification for the project or any other stakeholder to carry out monitoring and evaluation. PDM should be designed in a participatory manner by the concerned officers of the project so that the common understanding of the project activities and objectives can be established. The JICA Survey Team proposed the following Operation and Effect Indicators for the project to adopt for monitoring the project progress and assess its achievements and outcomes.

Table 6.7.10 Suggested Operation and Effect Indicators

Project Component	Operation Indicator	
	Indicator	Target
Eco-Restoration	Size of forests treated	50,000 ha (30,000 ha for model I, 10,000 ha for model II, 10,000 ha for model III)
	Size of NTFP plantation	500 ha
	No. of seedlings planted	15,050,000 plants (5,000,000 plants for model II, 10,000,000 plants for model III, 50,000 for NTFP)
	Lengths of fencing	5,550 km
	No. of PBRs prepared	13
	No. of modern nurseries developed	13
Livelihood Improvement and Community Development	Employment generation	20 Million person-day of work created
	Convergence	2,000 programs organized through convergence
	Revolving fund	INR 100 million revolving fund utilized by 2,000 SHGs
	No. of IGA clusters and federations	50 NTFP IGA clusters and 13 non-NTFP SHG federations developed
	Ecotourism site	7 community-based ecotourism sites are developed
	No. of micro plans	Maximum 1,000 micro plans/ cluster-based micro plans prepared and updated with proper GIS maps and safeguard frameworks
	SHG	Creation or adoption of SHGs
Other Support Activities	No. of village trainees	30,000 VP/ BMC members are trained
	No. of officer trainees	2,500 trainees from UKFD, NGOs and other concerned agencies participated
	Infrastructure development	1 PMU/NCE building, GIS/MIS laboratory, 13 DMU buildings and 37 FMU buildings are developed
Erosion Control and Sediment Disaster Mitigation	To be decided once the activities are defined.	To be decided once the activities are defined.

Project Component	Operation Indicator	
	Indicator	Target
Project Component	Effect Indicator	
	Indicator	Target
Eco-Restoration	Survival rate	At least 60% overall at the end of project (at least 2 sample plots per VP)
	Crown density	Above 40% density in the 80% of treated areas after 20 years
	Revenue of UKFD	Royalty from NTFP increased by 5% in 37 target ranges
	Water regime	30% of villages observe clear evidence of improvement (interview survey)
	No. of sites registered	13 sites registered as Heritage Site or other conservation programs
Livelihood Improvement and Community Development	Additional income	Increase in household income as a result of project activities (target and survey methods will be determined during the baseline survey)
	NTFP enterprise	Rs. 50 million increasing in total annual trade volume of NTFP by the clusters supported by the project (target will be revisited during the project)
	Revenue of NCE	The total annual revenue/ program supports to NCE exceeds INR 2 million at the time of project completion
	Drudgery	Time for women to carry fuel wood and water is reduced by 20%
	Sustainability of ecotourism	7 community-based ecotourism sites became financially self-sustaining at the end of project
	IGA	No. of SHGs taking more than 2 rounds of loans from VP (Target will be determined during the project)
Other Support Activities	Monitoring and evaluation	Regular external monitoring and evaluation are completed as per the plan, and the project is rated Satisfactory in all the 5 evaluation criteria
	Baseline survey, mapping, MIS	Necessary information for monitoring and evaluation became available with the project
	Research papers	At least 20 research papers were published in journals
Erosion Control and Sediment Disaster mitigation	To be decided once the activities are defined.	To be decided once the activities are defined.

Source: JICA Preparatory Survey Team

(5) Suggested Methodology for Monitoring Survival Rate and Regeneration Status

Survival rate and regeneration status are the key indicators of success of forest rehabilitation, as they reflect upon – quality of seedlings and soil conservation work undertaken, selection of species vis-à-vis existing forest condition, work timing, protection, maintenance and etc. Monitoring of survival rate and regeneration status will be done annually as per government guidelines, and measurements on the parameters would be recorded for the year 1, 3 and 5 of eco-restoration works. Survival rate and the height of seedlings, species generated, their growth, etc. would be monitored in the 1st year and 3rd year, while in 5th year and afterwards, collar girth of the seedlings is also measured in addition to these parameters.

Pre-survey works include:

- Copies of the digitized maps of the project sites would be utilized for sampling
- Regeneration plans along with the plantation journal should be obtained from respective divisions/ VPs
- Stratification: based on the knowledge of the area each site should be divided into smaller natural units or strata. The strata could be based on the land form or terrain (e.g. flat,

undulating hilly, rocky or river valley), disturbance regime (e.g. high, moderate or least disturbed), altitude, and vegetative types.

- d) A gridline is laid over the plan with quadrants of 10m x 10m in scale and serially numbered

By identification of selected plots in the field, systematic sampling allows detecting variation with the strata, and to sample such variations more evenly indicated steps should be followed

- e) Sample plots are chosen randomly using statistical random tables; sampling within each stratum should be done along the trail or transects that should be laid in random direction. On a steep hill slope it is better to lay transects along the contour or within a limit of altitudinal zone. Number of transects in each area will depend on the size of the strata. The sample plots would be located on either side of the trail at alternative point.
- f) There would be average 2 sample plots in one VP along each one km transect. It is recommended to take at least one transect per 5 sq.km of the forest. Selection of plots is done in such a manner so as to have proper representation of area.
- g) These plots are clearly marked with raised earthen mount having central peg. The sampling number (code) should be painted and GPS coordinate should be taken for future use.
- h) Size of sample plot:
- 10 m radius plot (314 sq.mt area) for tree species (more than 20 cm girth and 3 m in height);
 - 5 m radius plot (78.57 sq.mt) for shrubby or climber medicinal and aromatic plants. This plot could be used to count all the seedlings, saplings and pole etc. i.e. mature trees would be counted in 10 m radius and young sapling and seedlings will be counted within 5 m radius plot, in addition to shrubby plants.
 - Four rectangular quadrant of 1m x 1m would be placed in four directions just outside the 5 m radius circle as per situation for shrubs and herbs
- i) Carrying out the total enumeration species-wise in different height classes

The result of survey on survival rate and regeneration status will be periodically verified by a third party agency during the mid-term review, terminal evaluation and other impact assessment activities as discussed in 6.7.4 (3) .

6.7.5 Applied Forest Research and Publicity

The DPR mentioned that Forest Research will be funded to provide appropriate information, data, and new process to improve the project initiatives in forestry and social engineering aspects, but no specific research topics are mentioned. This project is mainly associated to the community participation and the intervention areas are also to be selected on priority within the community forests, known as VP Forests. Although these community institutions are functioning for the last more than 80 years, forestry research focusing on issues related to the community forests and their scientific management has been lacking. Some of the suggested research topics which could be taken under UFRMP are listed below:

Table 6.7.11 Suggested Applied Forest Research Topics

Topic	Description
Carbon measurement in VP Forest	The Study will be carried out in sample 10 VPs over about 1 ha of each VP for carbon accumulation over Five year period.
Comparative study of Forest Hydrology in the Chir pine Forest and Oak (<i>Quercus leucotrichophora</i>) Forest and degraded open Forest	The Study will include survey and documentation of the base line information regarding vegetation and stand structure of all the three sites and will follow measurement of metrological data of the sites regularly and discharge of water sources.
Developing growth and yield data of important NTFP species	Growth and yield data of selected NTFP species of the target area will be develop for assessment of the present status and future projections.

Topic	Description
Studies for assessment of unrecorded removal of fuel wood, fodder timber, NTFP (including MAPs) from the forest or from outside forest area.	Studies for estimating unrecorded removal of fuel wood, fodder and NTFP and other forest produce from the forest and outside forest area will be carried out within the selected target Ranges.
Studies related to increasing productivity & production of fuel wood and fodder species.	For this study some important fodder and fuel wood species will be selected for study of their productivity and assessment of total production and measures to be taken for enhancing total production of the species for the target areas.
Studies on indigenous and exotic grass, legumes and fodder species and their management models	Under this study potential grass, legumes and fodder species will be selected for developing suitable model for target area.
Studies related to Silvopastoral techniques and propagation of fodder species in intervention area under URFMP	The Study is in accordance to the agro-forestry models using agriculture and fodder tree and/or grasses, and will be develop for selected project areas.

Source: JICA Preparatory Survey Team based on the discussion with the Research Wing of UKFD

In addition to the research topics to be covered under the project, the following activities are suggested to be undertaken during the project:

Table 6.7.12 Suggested Activities for Applied Research and Publicity under the Project

Activity	Detail
Maintenance & Up-gradation of existing infrastructure	<ul style="list-style-type: none"> Maintenance of the exiting seed processing units: existing two seed storages and processing units will be upgraded and new processing and packaging methods will be developed. Strengthening of exiting Research nurseries including upgradation of existing nurseries. Maintenance and development of the high altitude Herbal Garden cum Eco-Park at Munsiri (Pithoragarh) situated at about 2700 m altitude, comprising about 70 ha area, which is an excellent centre for awareness, education and Research will be upgraded and maintained.
Strategy, Publicity & Dissemination of Research findings	<ul style="list-style-type: none"> Preparation of “Strategic Plan for Forestry Research and Development for Uttarakhand”, long term Strategic plan will be prepared after prioritizing the core areas and specific research topics for forestry research in Uttarakhand. Organization of National level Workshops, State level Workshops and Regional level Workshops during the Project period and participation in the local fares (Melas). Publication of “Lab to Land Leaflets” for stake holders for all research findings. Preparation of Detailed Research Reports after completion of the Research Projects for each project. Support for enrichment of the Library and documentation section; the Research Library at Haldwani will be enriched by adding important books and Periodicals.
Out sourcing of Research Scholars/Technical staff	To carryout various research projects and activities under UFRMP, support of technical staff/Junior Research Fellow/ Senior Research Fellow will be required, for which six such Research Scholars/ Technical staff will be engaged on contractual basis for project period.
Capacity building of Research staff	Capacity building of Research staff including officers, scientists, Research Scholars and field staff (Research Forest Rangers, Deputy Rangers/Foresters, Forest Guards etc.) will be carried out during the project period.
Expert/Consultant	For developing and designing of various research projects including Strategic Plan for forestry Research, and technical advice in implementing, monitoring & evaluation of research projects, Research Wing will need help of experts/consultants during the project period.

Source: JICA Preparatory Survey Team based on the interview with UKFD and Proposal received from Research Organization, UKFD

6.7.6 Project Continuity Strategy

The continuity of the project depends on how the project prepares itself during the project implementation period for the post project period. DPR proposes to build the capacity of the VPs and also to develop an institutional framework as well as its capacity during the project implementation so that the project outputs can be sustained and further brings about the impact to the communities that are involved in the project.

Proposed actions in DPR include: 1) issuance of the certificate to VP; and 2) Preparation of the post Project Continuity Plan by each VP (upadation of micro plan). It is proposed that these processes with regard to VP will begin at the beginning of the 7th year of the project and the assessment of the achievement should be conducted in order to identify the gaps that need to be filled before the completion of the project. The VPs will also be guided to manage the Corpus fund according to the guidelines developed by the project.

The linkage of SHGs with market will be initiated during the project period. From the 7th year onwards, the capacity of the cluster level organization will be reviewed and reinforced through capacity development activities. If any SHGs require linkage with other organisations, such will be facilitated by the project and FNGO experts. The DPR proposed that the PMU is to be transformed as 1) GIS and MIS centre for forest development and protection, 2) knowledge centre on JFM and 3) forestry related livelihood development or continue as it is with different purposes and objectives. The third option proposed in DPR is relevant to the livelihood support for the communities as well as for the development and marketing of the NTFPs even in the post project period. For that purpose, establishment of NCE has been proposed in this report.

6.8 Component 4: Erosion Control and Sediment Disaster Mitigation

6.8.1 Background

As the DPR was prepared and submitted to JICA before the recent disaster started in June 2013, no project components were included in the proposed project directly to address the disaster management. In view of the magnitude of disaster damages and underling future risks, it was deemed indispensable to include a stand-alone project component to counter the disaster risks, especially that are related to the problems within the forestlands, after a series of discussions among JICA, the Executing Agency, the JICA Survey Team and other stakeholders.

Through the additional contract between JICA and the Survey Team, the JICA Survey Team engaged additional experts on disaster management, including an international consultant, while undertaking the survey. The experts were asked to come up with general proposal on the sediment disaster mitigation component under the project without specifying project sites and detailed cost breakups as the disaster-affected areas were difficult to access during the survey during the monsoon season.

Key issues regarding the sedimentation disaster mitigation are discussed in **Section 3.11** and further in Volume II of this report, and summarized as:

- a. UKFD controls large areas in the state, most of which are steep sloped forestlands, where the sediment-related problems, such as landslides, flush floods, slope failures, soil erosion and sedimentation, are originating. Those areas with high disaster risks need to be treated by the UKFD properly.
- b. UKFD needs to develop the technical expertise and experiences in preventing such sediment disasters and rehabilitate the affected areas within the forestlands, by adopting appropriate technologies for proper geological and topographical surveys, proper hydrological surveys, analysis of disaster mechanisms based on the result of surveys, identification of appropriate measures, slope works using iron bar cribs and bioengineering, erosion control dams/ sabo dams using masonry and reinforced concrete, horizontal drainage boring, minor river training, etc.

- c. Basic information, such as area-specific topography, geological formation, water regimes, etc. must be collected and updated regularly for the analysis of disaster mechanisms, at least for those areas with high disaster hazard.
- d. Manuals, guidelines and standard operation procedures are required to be prepared regarding site selection criteria, survey and mapping, design criteria, cost estimation, procurement of consultants and contractors and construction.
- e. Public and private assets, such as roads, public buildings, agricultural lands, houses, etc. must be protected from the sediment disasters in a holistic manner, by treating slopes (mostly under the control of UKFD), roads and roads sides (under the control of Public Works Department/ PWD and Border Road Organization/ BRO) and rivers and their beds and banks (under the control of Irrigation Department). The coordination mechanism among the relevant agencies needs to be established.
- f. The information regarding the locations and scales of disasters needs to be collected on time and made available to relevant agencies.

6.8.2 Recommendations on Project Areas and Further Study

UFRMP will target 37 ranges within 13 divisions for eco-restorations and livelihood improvement/ community development. While the major works under those project components will be implemented through the participation of community people, the sediment disaster mitigation measures may be undertaken by specialized contractors as they would involve sophisticated civil works. The most affected areas by the recent disaster (that occurred in June 2013) are outside the 37 ranges, although the landslides, slope failures and other sediment-related problems occurred within the 37 ranges also.

In view of above, the project would target most affected areas in the following six forest divisions, although the areas would be outside the 37 selected ranges:

- a. Uttarkhashi Soil Conservation Division (Non-Territorial)
- b. Uttarkhashi Forest Division (Territorial)
- c. Rudraprayag Forest Division (Territorial)
- d. Badrinath Forest Division (Territorial)
- e. Bageshwar Forest Division (Territorial)
- f. Pithoragarh Forest Division (Territorial)

Among the 6 above, 4 divisions (Uttarkhashi FD, Uttarkhashi SC, Rudraprayag FD, Badrinath FD) are not covered under other project components. During the JICA Preparatory Survey, it was not possible to undertake detailed study on the locations of heavily affected areas, as the existing data and information were inadequate at the time of the JICA Survey during the aftermath. The monsoon was still at the peak during the most of the survey period. Therefore, it is strongly suggested to undertake detail study on the disaster affected areas and develop a disaster distribution map so that broad project areas can be identified for the sediment disaster mitigation component of this project.

As the work quantity could not be identified during the JICA Preparatory Survey, INR 2 Billion (approximately JPY 3 Billion) were allocated as lump sum amount for this component.

6.8.3 Overall Procedures of Planning and Designing for Sediment Disaster Mitigation Measures

Once a sediment disaster occurs, a standard procedure should be followed for the planning and designing of measures to address the issues of disasters. Suggested standard design procedure includes i) Creation of Disaster Distribution Map, ii) Site Reconnaissance, iii) Analysis of Disaster Mechanism, iv) Decision of Priority, v) Survey, vi) Monitoring, vii) Preliminary Design and Decision of Final Plan and viii) Detail Design.

(1) Creation of Disaster Distribution Map

It is important to know the entire disaster distribution for healthy forest management. The most effective method is to use the satellite photographs for the creation of disaster distribution map.

(2) Site Reconnaissance

In site investigation, the following items have to be conducted; i) Disaster Condition, ii) Topography and Geology, iii) Survey Plan, iv) Monitoring Plan and v) Brief Countermeasure Plan.

(3) Analysis of Disaster Mechanism

It is important to analyze the mechanism of disaster for the study of prevention works. The analysis of mechanism is to clarify the basic factor and the incentive cause. Typical sediment disasters are listed below:

a. Debris flow

This is a phenomenon in which soil and rock on the hillside or in the riverbed are carried downward at a dash under the influence of a continuous rain or a torrential rain. Although the flow velocity differs by the scale of debris flow, it sometimes reaches 20-40 km/hr, thereby destroying houses and farmland in an instant.

b. Slope failure

In this phenomenon, a slope abruptly collapses when the soil that has already been weakened by moisture in the ground loses its self-retainability under the influence of a rain or an earthquake. Because of sudden collapse, many people fail to escape from it if it occurs near a residential area, thus leading to a higher rate of fatalities.

c. Landslide

This is a phenomenon in which part of or all of the soil on a slope moves downward slowly under the influence of groundwater and gravity. Since a large amount of soil mass usually moves, a serious damage can occur. If a slide has been started, it is extremely difficult to stop it.

(4) Decision of Priority

In many cases, it is not possible or desirable to construct the prevention measures against all disaster sites. Therefore, the priority sites should be selected based on the prescribed selection criteria. The decision of first priority is expected to be conducted after the creation of disaster distribution map. The decision of second priority is expected to be conducted after site investigation. A set of typical selection criteria is listed below:

- a. Importance of existing assets to be protected (village/ houses, public buildings, road networks, etc.), scale of assets to be protected (economic effect and cost), risk/ distance between the assets to be protected and sites
- b. Risk of secondary disaster
- c. Representativeness of disaster (appropriateness of the sites for piloting)
- d. Environmental and social considerations

(5) Survey

In the survey, the following maps have to be created; i) Plane View, ii) Longitudinal Section View and iii) Cross-Section View. The details of survey are illustrated later in this report.

(6) Monitoring

It is important to conduct the monitoring if the secondary disaster is a concern. In that case, it is important to consolidate the information liaison system. Typical monitoring methods, which are low cost and applicable in the present conditions in the state are listed below:

- a. Monitoring using a displacement measuring devise
- b. Monitoring using ground surface extensometer
- c. Monitoring using Movement measuring reference studs
- d. Monitoring of precipitation using a tipping bucket type rain gauge

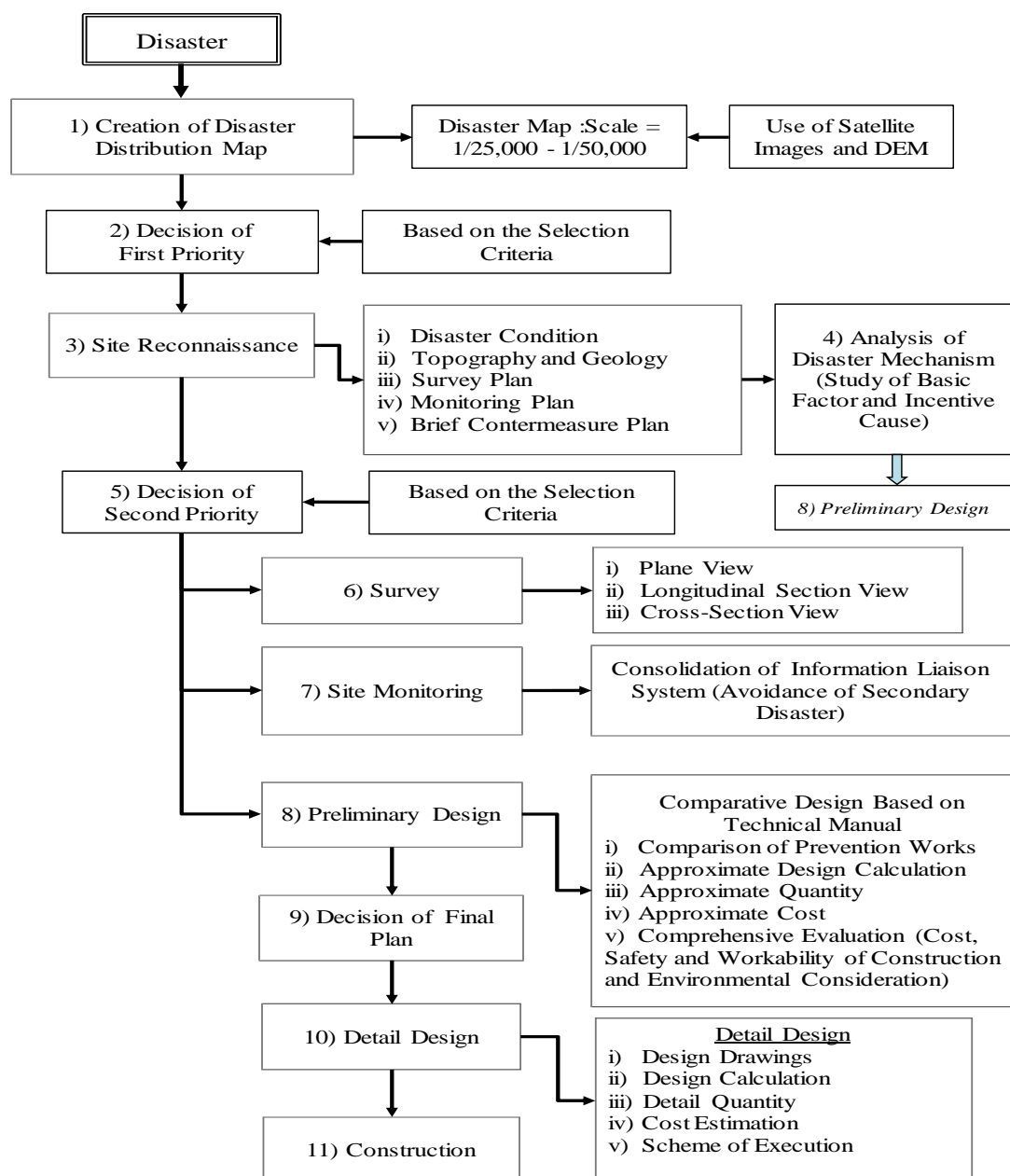
(7) Preliminary Design and Decision of Final Plan

In the preliminary design, the following matters have to be decided by a group of experts/ specialized engineers; i) Comparison of various potential prevention measures, ii) Approximate design calculation, iii) Approximate work quantity, iv) Approximate cost and v) Comprehensive evaluation of plan. The final plan has to be decided based on the comprehensive evaluation, which should consider cost/ effect analysis, work safety, workability and the environmental considerations.

(8) Detail Design

In the detail design, the following items have to be included; i) Design Drawings, ii) Detail Calculation of Design, iii) Designed Work Quantities, iv) Cost Estimation and v) Scheme of Execution.

The figure below shows the flow of procedure:



Source: JICA Preparatory Survey Team

Figure 6.8.1 Flow of the Detailed Design for Erosion control and Sediment Disaster Management Works

6.8.4 Preliminary Recommendations on Overall Project Activities

The overall project activities for Erosion Control and Sediment Disaster Mitigation under the project are suggested as briefly illustrated below based on the field visits, interactions with a number of UKFD officers:

-
- 1 Preparation of Sediment Disaster Distribution Map of Uttarakhand
 - 1.1 Collection of Data and Information on Sediment Disasters
 - 1.2 Preparation of the Sediment Disaster Distribution Map using GIS
 - 1.3 Updating the Sediment Disaster Distribution Map (once a year)
 - 1.4 Formation of inter-agency taskforce for sediment disaster mitigation
 - 1.5 Development of technical development plan and technology transfer plan
 - 2 Preparation of Draft Guidelines and Manuals
 - 2.1 Preparation of Guidelines for the Sediment Disaster Management
 - 2.2 Preparation of Design Criteria
 - 2.3 Preparation of Design & Construction Manual for Sediment Disaster Management
 - 3 Implementation of Experimental Works
 - 3.1 Selection of Sites for the Experimental Implementation
 - 3.1.1 Preparation of Selection Criteria
 - 3.1.2 Selection of Candidate Sites (6-8 sites per batch)
 - 3.1.3 Field Reconnaissance
 - 3.1.4 Final Selection of the Sites (3 sites per batch)
 - 3.2 Survey and Site Monitoring
 - 3.2.1 Preparation of Survey Plan and Bidding Document
 - 3.2.2 Cost Estimate for the Survey
 - 3.2.3 Bidding and Contracting
 - 3.2.4 Conducting the Survey
 - 3.2.5 Establishment of the Site Monitoring System
 - 3.2.6 Monitoring of Sites (assessment of workability, safety, etc.)
 - 3.3 Plan and Design for Countermeasure / Mitigation Measures
 - 3.3.1 Alternative Study
 - 3.3.2 Decision of the Final Plan
 - 3.3.3 Detail Design and Cost Estimate
 - 3.4 Implementation of the Countermeasure / Mitigation Measure
 - 3.4.1 Bidding and Contracting
 - 3.4.2 Experimental Implementation (possibly under technical cooperation)
 - 3.5 Work Supervision
 - 3.5.1 Progress Monitoring and Quality Control
 - 3.5.2 Issuance of Completion Certificate and Preparation of Final Report
 - 4 Finalization of the Draft Guidelines and Manuals
 - 4.1 Feedback from the Experimental Implementation
 - 4.2 Finalization of the Guidelines and Manuals
 - 5 Dissemination of the Guidelines and Manuals to District Offices
 - 5.1 Capacity building of field officers
 - 5.2 Technical support to the Yen Loan project
 - 5.4 Experimental integration of disaster aspects into a Working Plan
 - 6 Dissemination to other Himalayan states
 - 6.1 Policy recommendations for mainstreaming sediment disaster mitigation
 - 6.2 Preparation of final reports
 - [Full-Scale Implementation]
 - 7 Priority Ranking for the Implementation of the Countermeasure / Mitigation Measure
 - 7.1 Development of Criteria for Prioritization
 - 7.2 Grouping with Priority
 - 7.3 Field Reconnaissance for the Priority Group(s)
 - 7.4 Making Priority Ranking in the Priority Group(s)
 - 8 Preparation of Annual Implementation Plan and Budget Request
 - 8.1 Selection of the Sites with Priority for Implementation
 - 8.2 Provisional Cost Estimate
 - 8.3 Budget Request
 - 9 Design and Cost Estimate (including Survey)
-

- 9.1 Bidding and Contracting
- 9.2 Survey and Site Monitoring
- 9.3 Alternative Study
- 9.4 Detail Design
- 9.5 Cost Estimate
- 9.6 Preparation of Tender Documents
- 10 Bidding for the Implementation
 - 10.1 Bidding and Contracting
 - 10.2 Implementation of the Design Work
 - 10.3 Work Supervision

The detailed schedule of above activities is shown in **Attachment 6.8.1**.

It is important to note that the technical expertise of UKFD and its actual work experiences need to be developed for survey, designing, cost estimation, preparation of tender documents, work supervision and evaluation of work quality for the issuance of completion certificate to the contractors. The JICA Survey Team proposes the engagement of experts/ specialized engineers to support the UKFD in the implementation of this particular project component and to transfer their technologies to UKFD so that the capability of UKFD will be developed for the execution of sediment disaster mitigation works. The activities illustrated above were designed in such a way that smaller-scale experimental works will be undertaken at the initial stage with the help of technical assistance by consultants, while the UKFD is developing its technical expertise. Some capacity building activities are included in the proposed activities also.

The measures for sediment disaster mitigation are urgent, but it is expected to take some time for the procurement of consultants/ engineers for the UFRMP. In order to expedite the early implementation of sediment disaster mitigation works, the consultants/ engineers with appropriate technologies should be mobilized quickly, and capability of UKFD needs to be improved fast. In view of this, the JICA Survey Team proposes to explore the possibility of two technical cooperation projects by JICA on sediment disaster mitigation.

The technical cooperation under the scheme of “Special Assistance Facility for Yen Loan Projects (Yuushou Kanjou Gijutsu Shien)” may be mobilized for Item 1-3.3.1 and 4 above, and another scheme of “Project-Type Technical Cooperation” may be adopted for Item 5-6.

Because the administrative procedure is simpler for the “Special Assistance Facility for Yen Loan Projects (Yuushou Kanjou Gijutsu Shien)”, the consultants/ engineers can be mobilized quickly under this scheme. “Project-Type Technical Cooperation” has the advantage of longer implementation duration and larger budget allocation by JICA. By combining the two schemes, the experimental works can started early through the “Special Assistance Facility for Yen Loan Projects (Yuushou Kanjou Gijutsu Shien)”, and adequate capacity building of UKFD can be completed through “Project-Type Technical Cooperation”.

6.8.5 Samples of Project Works for Sediment Disaster Mitigation

The overall project activities for Erosion Control and Sediment Disaster Mitigation under the project are suggested as briefly illustrated below based on the field visits, interactions with a number of UKFD officers:

(1) Surveys

Typical surveys required for the measures for sediment disaster mitigation are indicated below, and some of the specialized survey components may be outsourced to technically competent organizations:

Table 6.8.1 Main Surveys Required

Type of Survey	Type of Measures		
	Erosion Control	Stream Training	Slope Stabilization
Topographical survey (horizontal, vertical, cross section)	✓	✓	✓
Geological survey	✓	✓	✓
Geographical reconnaissance	✓	✓	✓
Boring survey	(✓)		✓
Bolder availability survey		✓	
Groundwater survey			✓
Sliding surface survey and monitoring			✓
Survey on moving landmass quantity			✓
Laboratory testing of soil and rocks			✓
Geophysical prospecting (elastic wave prospecting, electrical prospecting, etc.)			✓

Source: JICA Preparatory Survey Team

It was observed that UKFD may not have technical expertise and experiences in undertaking above surveys, especially for the slope stabilization, which is vital for sediment disaster mitigation. The project should engage experts/ engineers who can develop a set of detailed scopes of works and tender document so that the works can be outsourced to the specialized survey agencies. The experts/ engineers should also evaluate the survey proposals, support the contracting and supervise the works. The experts/ engineer should work closely with the officers of Executing Agency at various levels so that the technical expertise will be transferred to the UKFD.

(2) Slope Failure Countermeasures

Various countermeasures would be taken up by the project to control large erosion. The photo shows the occurrence of slope failure, which killed 6 people.



Source: JICA Preparatory Survey Team

Figure 6.8.2 Site Photograph showing Slope Failure

The slope seemed to be within the forest area, though it was not confirmed. This type of problems is common in the state, and to address this issue, a series of check dams may be constructed as shown in the figure below:

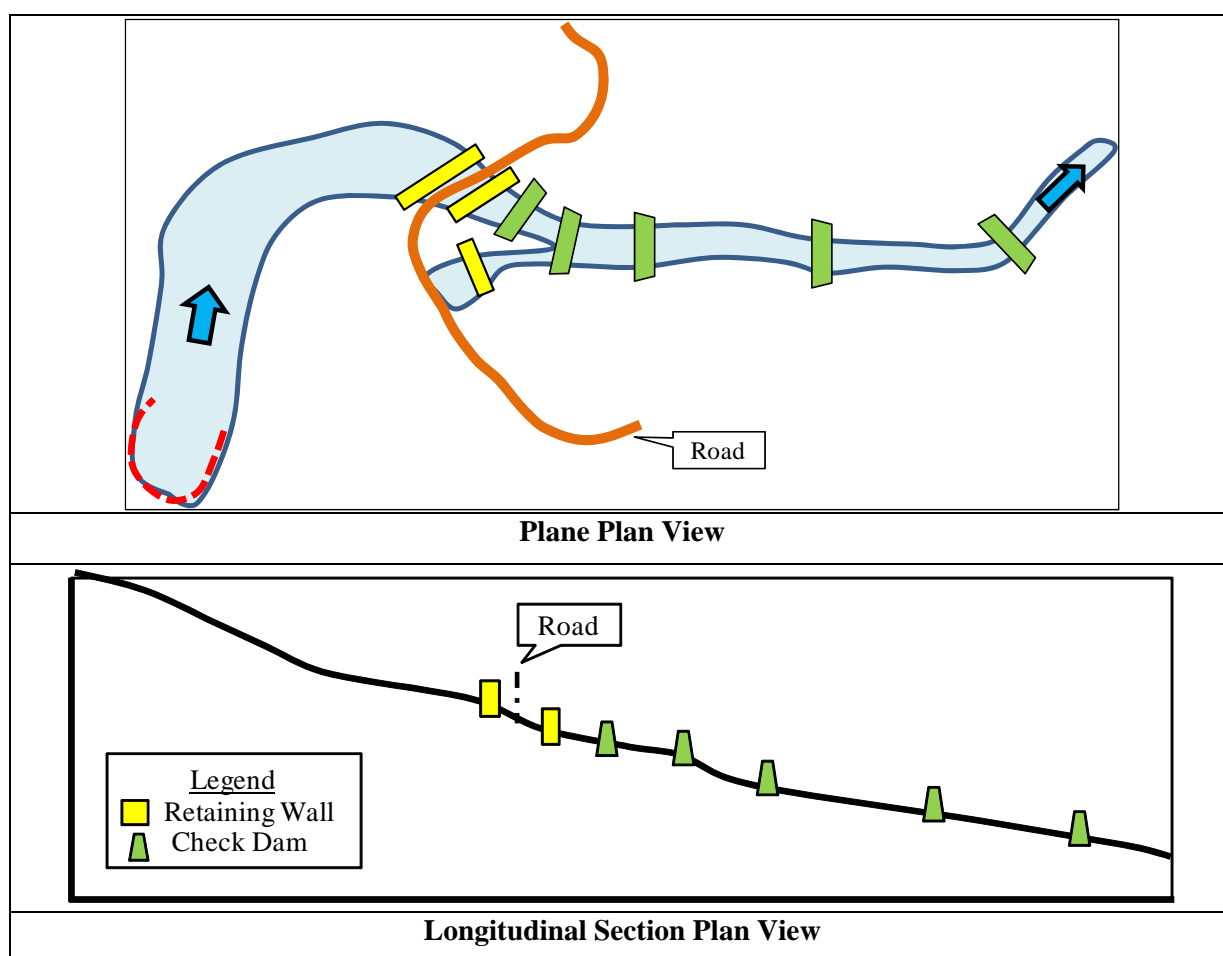
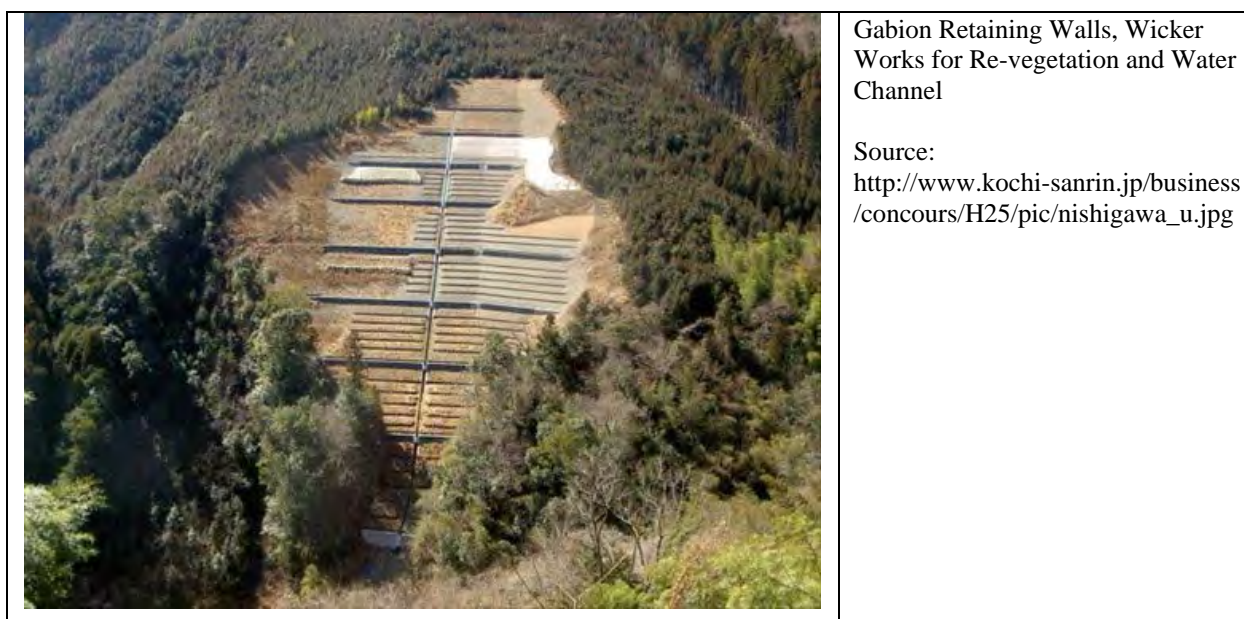




Figure 6.8.3 Sample Prevention Plan

Actual plans have to be prepared based on the fully investigation.

The samples of appropriate technologies available in Japan are shown below for the prevention of slope failures



	<p>RCC Crib Works (upper most part), RCC Check Dams (upper part), Wooden Pile Retaining Walls, Wicker Works for Re-vegetation and Water Channel</p> <p>Source: http://www.rinya.maff.go.jp/kanto/tisan/03_zigyogaiyo/kozisyurui/img/kouji_02.jpg</p>
	<p>Staggered RCC Check Dams, Wicker Works for Re-vegetation and Water Channel</p> <p>Source: http://www.pref.nagano.lg.jp/sakuchi/sakuchi-rimmu/shokonorin/koho/documents/tokikubo.jpg</p>
	<p>Closer look at the Wooden Pile Retaining Walls and Wicker Works for Re-vegetation</p> <p>Source: http://www.pref.shiga.lg.jp/imazu-pbo/kankyoku/images/sanpuku.jpg</p>

	<p>Steel Bar Gabion Retaining Wall at the lower part of slope failures</p> <p>Source: http://www.hodumi.co.jp/members/list/materials/frame_2.html</p>
	<p>Contour Terracing by Wooden Retaining Walls, Foundation Works for Re-vegetation</p> <p>Source: http://www.center-green.or.jp/hanbai/wb/images/wbsumple04.html</p>

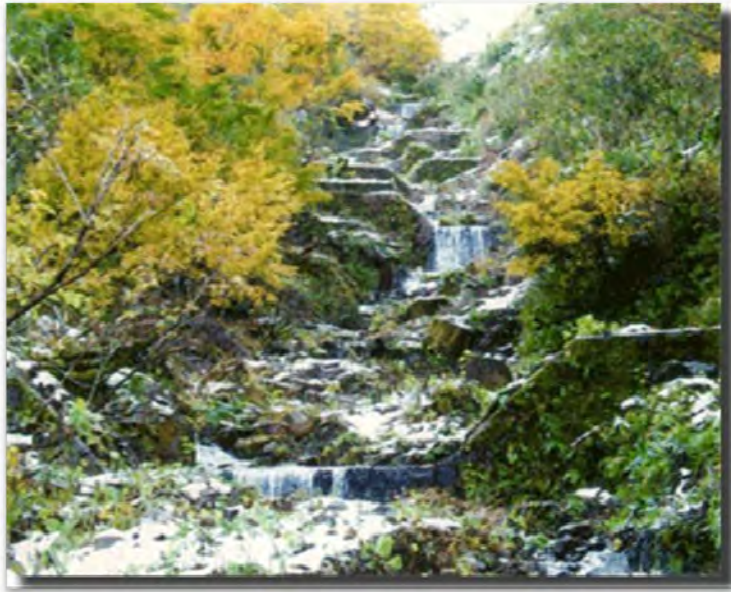


Source: Compiled by JICA Preparatory Survey Team

Figure 6.8.4 Appropriate Technologies to prevent Slope Failure

Other more effective and expensive measures are also available, such as RCC crib works, anchor works, etc. Most appropriate technologies should be adopted by the project in consideration of cost/benefit, geology of Himalaya, prioritization, etc.

(3) Stream Training within the Forestlands

Various countermeasures would be taken up by the project to control erosion and flash floods caused by surface water flow. The samples of appropriate technologies available in Japan are shown below for stream training in the forest areas:

	<p>A series of Masonry Check Dams and Bankings Source: http://www.mlit.go.jp/river/sabo/bunkazai/bunkazai_56.html</p>
	<p>RCC Check Dam and Banking with Re-vegetation Source: http://www.rinya.maff.go.jp/tohoku/syo/akita/gyomu/tisan.html</p>
	<p>Masonry Stream Bank Protection, Riverbed Protection and a Masonry Check Dam Source: http://www.cbr.mlit.go.jp/kawatomi/zu/2-e/0301.htm</p>

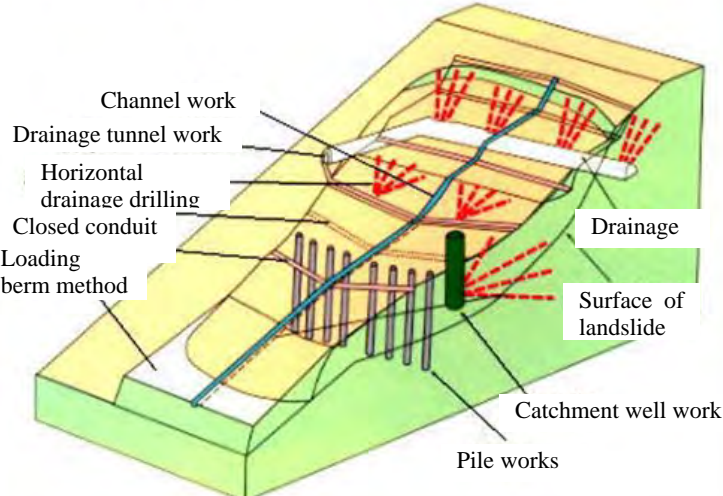

Source: Compiled by JICA Preparatory Survey Team

Figure 6.8.5 Appropriate Technologies for Stream Training

(4) Landslide

Various countermeasures would be taken up by the project for landslides. The works for landslide prevention tend to be of a larger scale and expensive, and appropriate technologies must be adopted as per the priority. Controlling the ground water underneath of slope is one of the key for the prevention of landslide, and proper boring method can be effective if surveyed thoroughly and undertaken properly. The samples of appropriate technologies available in Japan are shown below for the boring to prevent landslides:

Table 6.8.2 Illustration of Comprehensive Landslide Countermeasure and Image of Horizontal Drainage Boring



<p>Schematic diagram of counter measure</p> 	<p>Concept of Comprehensive Landslide Countermeasure (Boring, Banking, Cutting, Drainage, Piling, etc.)</p> <p>Source: http://www.pref.miyagi.jp/uploaded/image/37020.JPG</p> <p>Original Text in Japanese Translation given by JICA Preparatory Survey Team for reference</p>
	<p>Outlet of Horizontal Drainage Boring</p> <p>Source: http://www.jisuberi-kyokai.or.jp/gijyoho/gijyutu/sekkei/yokobo/model.html</p>

Source: Compiled by JICA Preparatory Survey Team

(5) Holistic Approach to Treat Forests, Roads and River

The photos below are the sample of landslide common in the state:

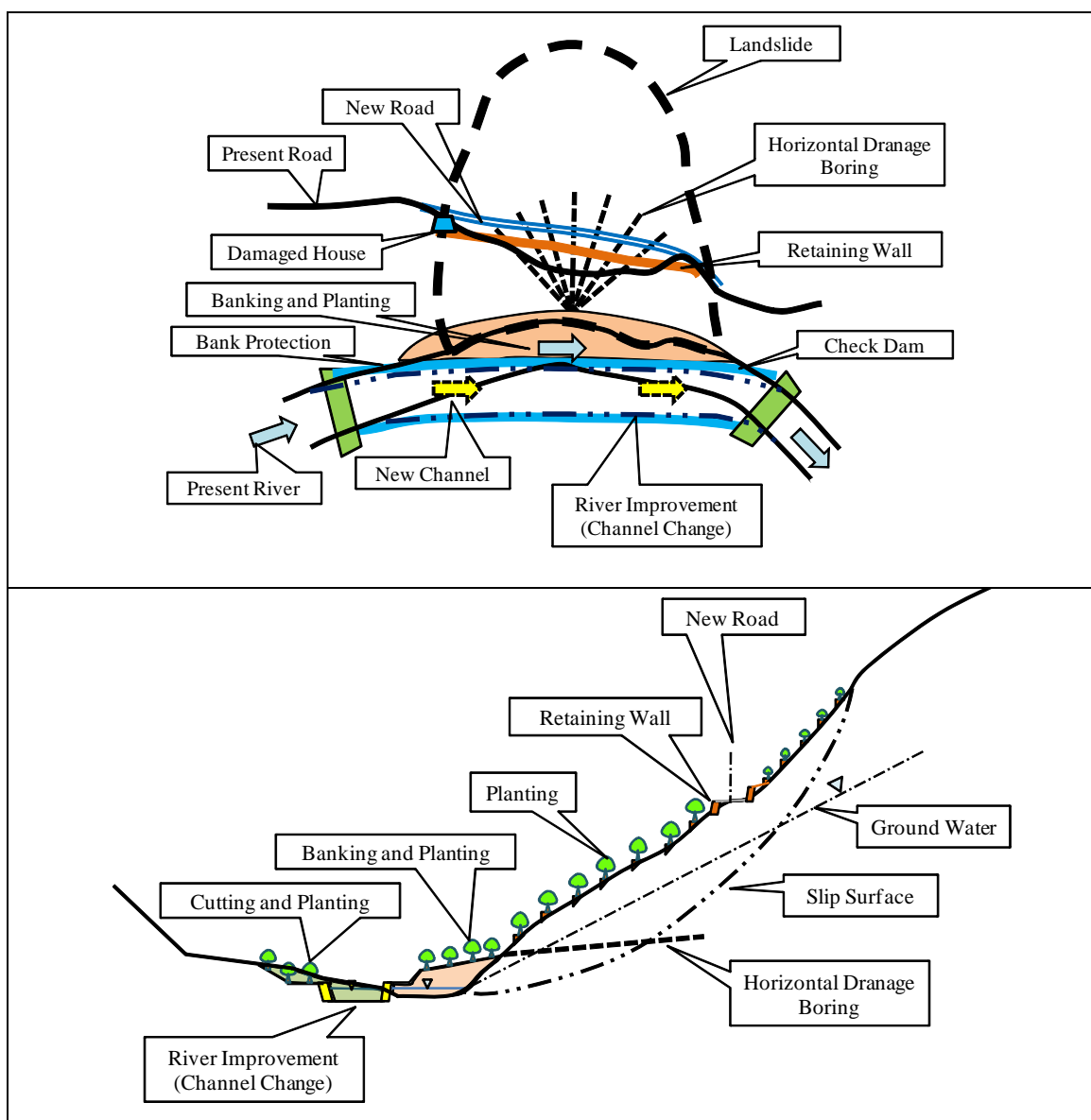
Table 6.8.3 Site Photograph of the Land Slide commonly observed in Uttarakhand

	<p>Upper part of the slope is gradually sliding, as indicated by the vertical cracks on the land.</p> <p>Lower part of the slope is already coming down to the road in a form of slope failure</p> <p>There is a river curving below the road as shown below in the photo of the same location (google image):</p> 
---	---

Source: JICA Preparatory Survey Team

The major problem in this case seems to be the unstable slope in the upper part, in addition to the river bank erosion, which is drawing the land downwards. The basic approach in such a case should be:

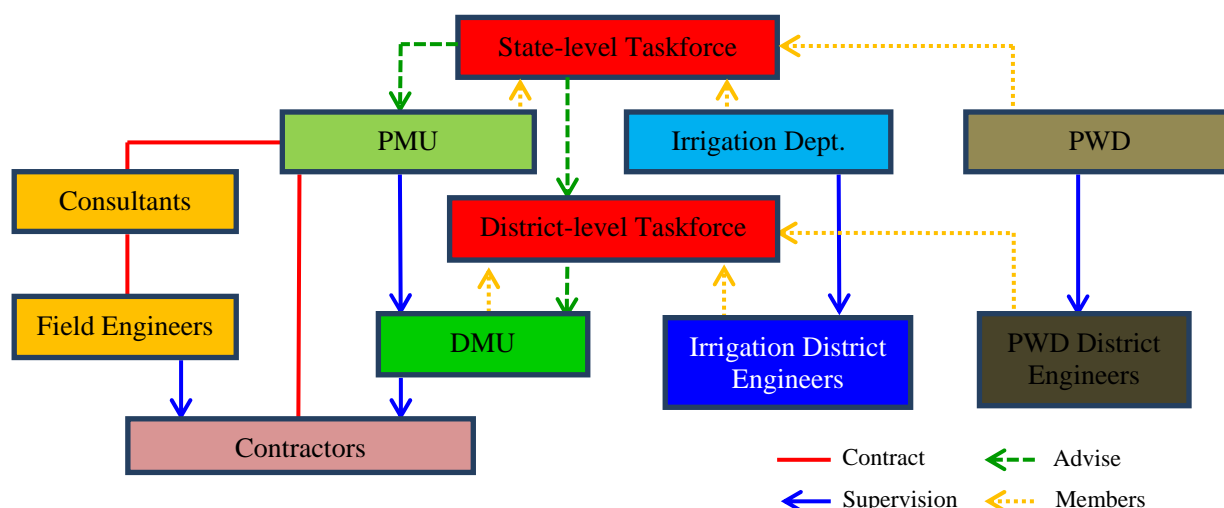
- i) Stabilization of slope by banking at the bottom of the slope, covering denuded slope surface by re-vegetation and horizontal drainage boring for reducing the landslide movement → Work to be carried out by the UKFD
- ii) River training to prevent the river erosion by the construction of spurs, low check dams in the river for the protection of the river beds and banks. A large lower terrace in the right bank is available for changing the course of river flow, so changing the channel direction by banking should be an effective measures in this case → Work to be carried out by the Irrigation Department
- iii) Repairing road surface, roadside slopes and other accessories of roads → Work to be carried out by the Public Works Department



Source: JICA Preparatory Survey Team

Figure 6.8.6 Image of Holistic Approach to Disaster Mitigation Works

In this case, the Forest Department should involve other departments, as Irrigation and Public Works Departments. A taskforce team may be formed among the representatives of concerned agencies, which will review the survey proposals, survey results, designs and plans, tender documents and progress reports as shown in the figure below:



Source: JICA Preparatory Survey Team

Figure 6.8.7 Operational Framework of Disaster Mitigation Works

(6) Reconstruction of Damaged Forest Roads/ Trek Routes

During the recent disaster, approximately 1,000 km of forest roads have been damaged, according to the report by the World Bank and Asian Development Bank (ADB). The project will assist the reconstruction of such roads. Even though re-alignment is required for the forest roads/ trek routes, the forest clearance will not be required in view of the existing Forest Conservation Act.

(7) Emergency Shelter

25 emergency shelters (average one shelter for 4 VP) may be constructed at strategic locations within the project areas. This shelter will be the temporary evacuation centre in the time of emergency under a disaster situation. The building must be constructed as per the national guideline for the emergency shelter, in accordance with the standard design for an earthquake proof structure.

Approximately 431 m² flint area building, which would cost around INR 800,000 and can accommodate over 900 people for the critical several days after the disaster has been proposed in the project. Proper emergency kits, including emergency food, solar lights, blankets, rescue tools, etc. would be provided to the building, which worth about INR 300,000 per unit. The construction of such building may be done by appropriate contractors.

1) Development of Architectural Designs

Assuming 2 sq. ft. /per person during emergencies (as per the latest National Disaster Management Authority / NDMA guidelines), the Emergency Safe Shelters have been designed for a capacity of approximately 900 people under covered roof area with another 500 on the roof, if it is not winter or raining. The design of Emergency Shelters suits the degrees of multi-hazards prone that these areas are exposed to. To reiterate, these Emergency Shelters do not accommodate Flood considerations alone, but also the Seismic tremors as Uttarakhand is an earthquake prone state. The affected area comes under Earthquake Zone IV and V (as per the Govt. of India Earthquake Vulnerability map of India).

Flood considerations include a plinth height of minimum 0.3 m above the Highest Flood Level [HFL] and the First Floor level has been designed to pass the maximum flood heights.

2) Stilt/ Ground Floor of Shelter

The stilt/ ground floor has been left open without any partitions/ walls to avoid hydrostatic pressure on walls leading to erosions and scour in case of inundation. During severe inundations, the stilted floor with adequate plinth height will help in keeping the livestock safe. As a secondary use, this will be used by the local communities during social gatherings, festivals, etc. There is also an administration room, a separate sick room having sleeping arrangements for patients who are to be kept away and

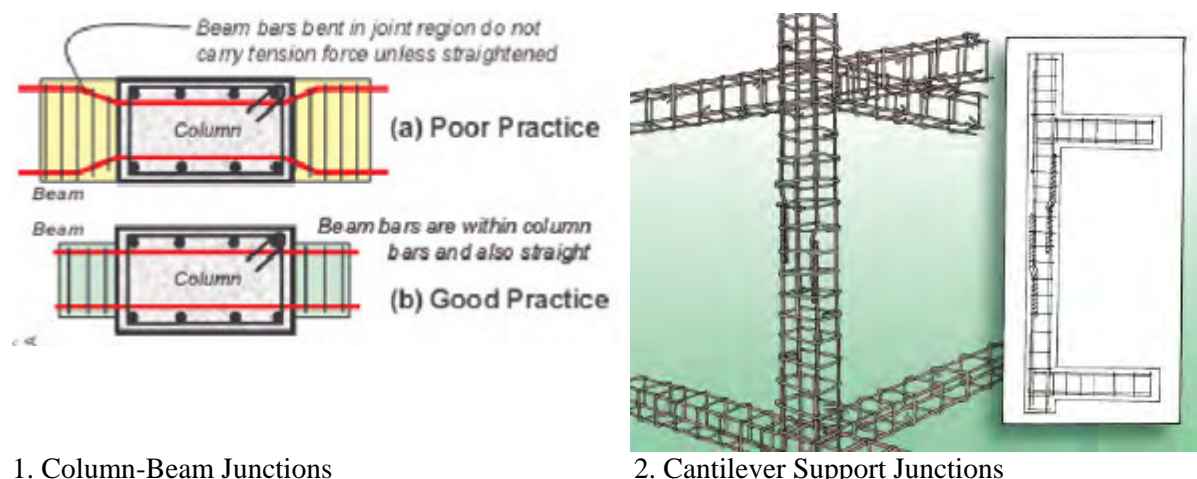
may require lying. Considering the safety for the differently abled, ramp with a slope of 1:10, with railings have been provided so that children, the differently abled and the aged can climb up safely.

3) First Floor and Roof

The first floor consists of dormitories where ladies and gents can be separately accommodated along with separate toilet and bath facilities. Provisions for a 600 mm wide loft/ *chajja* have been made for keeping the minimum belongings of the occupants. A separate room for pregnant women or children's play area is additionally provided to respect the privacy of mother and her child. The roof of the first floor/ terrace can also offer shelter during emergencies.

4) Development of Structural Designs

The structural designs for each site take into considerations the soil conditions and the multi-hazards that the areas are exposed to. Deep foundations have been proposed i.e. raft foundations not only to withstand the load of the structure but to give protection against scouring (resulting from High Flood) and against Earthquakes. The Ground Floor is stilted with columns designed for smooth passage of water in case of flood and storm surge and the columns are raised up to the plinth height. Further, the detailing required not only as good but also safe practices have been incorporated herein, especially at Column-Beam junctions, cantilever support junctions, etc.



1. Column-Beam Junctions

2. Cantilever Support Junctions

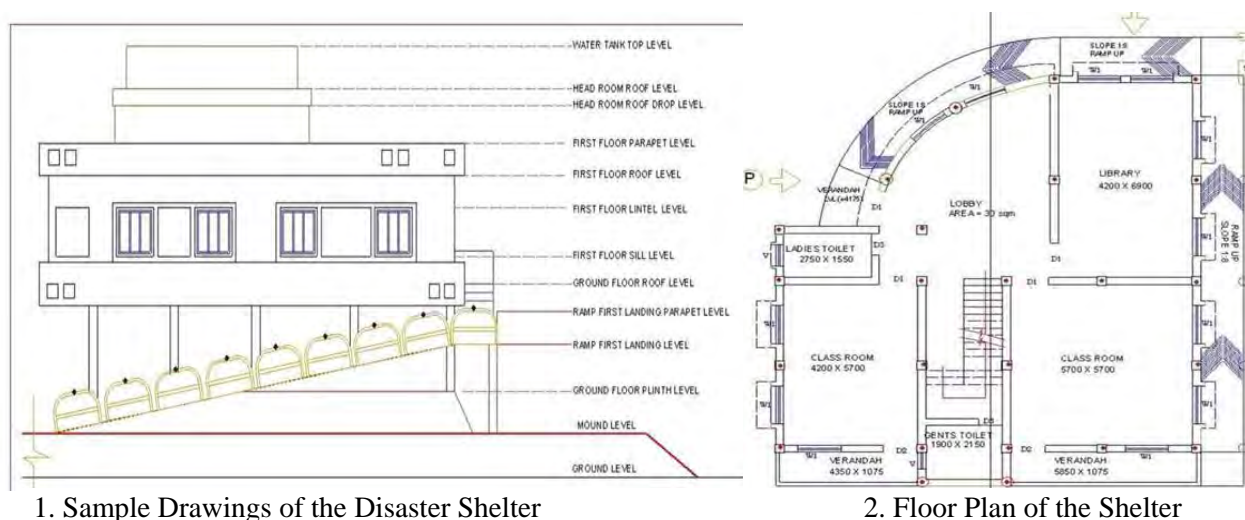
Figure 6.8.8 Sample Drawings of Column-Beam junctions and Cantilever Support Junctions

5) Cost Estimations and Bill of Quantities

After the designs related to both the space and steel are finalized, detailed estimates are to be prepared for each of these buildings based on the prevailing rates of the building materials including its transportation costs along road/ waters up to the site. As a start to the construction process, the local Labor Contractors, Masons, Site Engineers and Supervisors will be trained on the construction process with technical details to be adopted, after which the constructions ensued.

6) Sample Designs and drawings

The building is designed as per framed structure design and after the soil testing of the particular location. Sample diagrams are mentioned below for the general understanding of the structures and the references mentioned below.



1. Sample Drawings of the Disaster Shelter

2. Floor Plan of the Shelter

Source: Compiled by JICA Preparatory Survey Team from

<http://osdma.org/ViewDetails.aspx?vchglinkid=GL007&vchplinkid=PL062>

Figure 6.8.9 Sample Drawings and Floor Plan of an Emergency Shelter

(7) Emergency Kit

The project will construct approximately 1,000 VP Office Buildings cum Disaster Relief Centre (approximately 40 m² each). These buildings will have a small storage room, and the project will provide emergency kit (indicated above), which is worth about INR 150,000 per unit.

(8) Overseas Training on Disaster Management

Innovative initiatives and advance technologies are tested in other countries, including Japan, where the similar sediment disasters occur frequently. Key project staff and other stakeholders will visit those places to learn the appropriate technologies that are applicable under the conditions in the state.

6.9 Component 5: Consulting Services

The DPR proposes the engagement of Project Management Consultants (PMC) for steering specialized activities and M&E under the project, which requires a set of specific skills as income generation, community development, capacity building, communication skills, baseline data collection, management information system (MIS) and GIS/ remote sensing. The DPR indicates that the services of both international and national experts are required for this, both at the state and field levels. The field level experts (FLE) are expected to facilitate the support of Field NGOs, provide technical support in micro planning, support for the market linkages, training & capacity building of SHGs, etc.

The DPR indicates the proposed positions/ fields for consultants for PMC as:

<u>International Consultants</u>	<u>National Consultants</u>
- Community Development	- Community Development
- Biodiversity	- Biodiversity/ Ecotourism
- M&E	- M&E, GIS and MIS
- Marketing	- Income Generation & Livelihood Improvement
- Training	- Capacity Development

The duration of service period is not indicated in the DPR.

The JICA Survey Team recognized the needs of PMC to support the project implementation technically at the state level. The JICA Team proposes the engagement of PMC for the duration of 6 years (72 months).

The JICA Survey Team also recognized that adequate technical expertise are available with the UKFD and other concerned agencies in some of the fields identified above and would proposed the following positions/ fields to be included in the PMC, where the project requires external experts and engineers:

Table 6.9.16.9.1 Summary of Recommendation on Consultancy Services

	International Consultants	MM
1	Community-Based Forest Management Specialist/ Team Leader	34
2	International and National Marketing Specialist for NTFP	14
3	Community- Based Ecotourism Product Development and Marketing	9
4	Disaster Management Engineer	18
	TOTAL	75
	National Consultants	
1	IGA and Livelihood Improvement Specialist/ Co-Team Leader	41
2	M&E and MIS Specialist	24
3	Ecotourism Specialist	9
4	GIS and Remote Sensing Specialist	29
5	Grand Planning and M&E Specialist for Erosion Control/ Co-Team Leader	27
6	Construction Engineer	9
7	Design Engineer	12
8	Assistant Design Engineer	12
9	Cost Engineer/ Construction Planning	6
10	Environmental Safeguard and Safety Engineer	9
11	Procurement Engineer	3
12	Field Engineer	64
13	Surveyor	32
14	CAD Technician	8
	TOTAL	285
	GRAND TOTAL	360

Source: JICA Preparatory Survey Team

The suggested Terms of Reference of PMC are indicated in **Attachment 6.9.1**. Also, the details of suggested assignment schedule of PCM are shown in **Attachment 6.9.2**.

Since the erosion control and sediment disaster mitigation has been included as a part of project component, it is necessary to include experts/ engineers with appropriate engineering expertise, as the UKFD has limited experiences and expertise in this field.

Under the budget of PMC, the DPR proposes to include 4 Field Level Experts (FLEs) at each target Division, in addition to the FLE Team Leader and Forestry Expert. While the project will create Division Management Unit (DMU) and Field Management Unit (FMU) for project implementation and will engage contractual staff members to be recruited from the open market (which will be the eligible portion of JICA loan), the function of FLEs will be taken over by the contractual staff at DMU and FMU. Therefore, there is no need for FLEs under the PMC, and the JICA Survey Team suggests to exclude such a component.

The DPR indicates that PMC will be procured through a national bidding process. Whether an international bidding process should be adopted or not needs to be examined by JICA, and JICA's guideline for international competitive bidding should be followed if the international bidding will be adopted.

Chapter 7 ENVIRONMENTAL AND SOCIAL CONSIDERATIONS

7.1 Scheduled Tribes and Transhumants in Uttarakhand

The total Scheduled Tribe (ST) population of Uttarakhand is 291,903 representing around 5.7% of the State's total population. STs generally reside in rural areas and thus the percentage increases slightly in terms of rural areas i.e. 264,819 ST peoples representing 7.5% of the total rural population of Uttarakhand (based on 2011 Census Data).

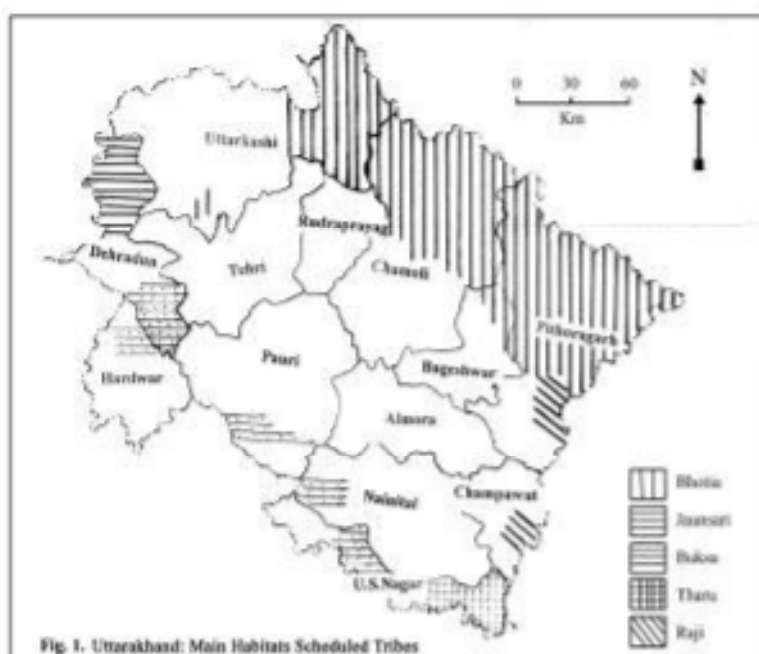
Five different ST groups are found in Uttarakhand: The Bhotia, Buksa, Jaunsari, Raji and Tharu groups. There is no up to date data on the exact size of the population of each group as disaggregation did not take place in the 2011 Census. Typically the 2001 Census data is still referred to for this purpose and according to this data; Tharus are the largest of the five STs in Uttarakhand. They account for 33.4 per cent of the ST population of the State, followed by Jaunsaris (32.5 per cent), Buksas (18.3 per cent), and Bhotias (14.2 per cent). Rajis are very small in number.

Table 7.1.1 Scheduled Tribe Populations in Uttarakhand

	Tribe	Population	Proportion of State Tribal Population (%)
1	Tharu	85,665	33.4
2	Jaunsari	83,262	32.5
3	Buksa	46,771	18.3
4	Bhotia	36,438	14.2
5	Raji	517	0.2
	TOTAL	256,129	100

Source: Census of India (2001)

These groups are generally found in specific geographical pockets and again based on 2001 Census data – the majority of the ST population (93.4%) is concentrated in four districts, namely, Udham Singh (US) Nagar (43%), Dehradun (38.8%), Pithoragarh (7.5%), and Chamoli (4.1%). The figure below provides an illustration of the geographic distribution of STs in Uttarakhand.



Source: Tribal Demography of Uttarakhand (Pant, 2010)

Figure 7.1.1 Geographical Distribution of STs in Uttarakhand

In addition to the STs, there is also a transhumant group known as the Van Gujjars. The Van Gujjars are not officially registered as an ST (although they themselves are demanding to be recognized as such and there is a social movement proposing this¹). Due to the group's distinctive culture and way of life as well as the fact that they identify themselves as such suggests they should also be recognized under this framework. However, since the Van Gujjars have not hitherto been recognized as a ST, there are no official population figures.

The table below provides a summary description of each of the ST groups.

Table 7.1.2 Scheduled Tribes in Uttarakhand

	Group	Distribution	Description
Scheduled Tribes			
1	Buksa	Tarai-Bharbar region	Defined as a Primitive Tribal Group (PTG), the Buksa have suffered from extensive land alienation as outside settlers settled in the Tarai. As a result most Buksa's are working as landless farmers. Mulberry trees are commonly grown for sericulture as well as fruit trees
2	Tharu	Tarai-Bharbar region (particularly US Nagar and Champawat Districts)	Tharu are a settled tribe found mainly in the Tarai and low hills areas. There are well-documented ongoing conflicts over land rights particularly in US Nagar as this tribe lost land many decades ago to Uttarakhandis and other settlers. Agriculture is the mainstay of their livelihoods.
3	Bhotia	Higher altitudes of Pithoragarh, Bageshwar, Chamoli and Uttarkashi Districts	The name Bhotia is actually in reference to a geographic area, Bhot, used by the British in the colonial era. The people themselves dislike the term and should actually be addressed as the Marchas, Tolchas, Johari Saukas, Darmians, Chaudansis and Byansis. These peoples migrate seasonally to graze goats and sheep from which they produce wool, their primary livelihood.
4	Raji (Van Rawat)	Pithoragarh District	The Rajis are a PTG, very small in number, occupying the high altitude regions in Pithoragarh and in Nepal. They have their own dialect, live in seclusion and have a very close relationship with forests and other natural resources. Rajis derive an important part of their diet from fishing using long cloths.
5	Jaunsari	Chakrata and Kalsi Blocks, Dehradun District	The only ST group that occupy the mid-hills region. They maintain distinctive dress but they are a settled tribe, participate actively in Panchayati institutions (although they also have their own governance system, the Khat) and many are well educated. Maintain large herds of cattle and goats and depend on forest resources for timber for house construction, firewood and fodder.
Transhumants			
6.	Van Gujjar	Dehradun, Pauri Garhwal and Nainital districts with annual seasonal migration during the summer months to Uttarkashi and Kedarnath	A nomadic group found in Uttarakhand and forested Bhabar tract of Uttar Pradesh. The name literally means forest dwelling. They originate in Jammu but moved to Uttarakhand in early 19th century. They migrate annually to their summer pastures in Uttarkashi and Kedarnath following defined routes. The governments of both Uttar Pradesh and Uttarakhand have made repeated attempts to settle them. The Gujjar economy revolves around buffaloes, and selling milk/milk products to settled villagers. They often rely on middlemen of the <u>Bania caste</u> , to whom many are now indebted. As nomads, they have difficulties proving land ownership, and often face eviction from their camp sites. The Van Gujjar are Sunni Muslims, but maintain a number of pre-Islamic customs. They speak Gojri language but most understand Hindi.

Source: JICA Preparatory Survey Team (information compiled from various sources²)

¹ http://zeenews.india.com/news/uttarakhand/ngo - demands - st - status - for - uttarakhand - vangujjars_830407.html
<http://post.jagran.com/search/van-gujjars-of-uttarakhand>

² Dobhal, R. ed., 2012; *Uttarakhand State of the Environment Report*. Uttarakhand State Council for Science and Technology. Published by Abhimanyu Gahlot, Dehradun, India.

7.2 Scheduled Tribes and Transhumants in the Project Area

The Scheduled Tribes and Transhumants Planning Framework (STTPF) shall apply specifically to the 5 STs found in Uttarakhand: Bhotia, Buksa, Jaunsari, Tharu, and Raji peoples as well as the Van Gujjars.

7.2.1 Scheduled Tribes

It has been found difficult to define the exact numbers of tribal groups residing within the project area. This is owing to a combination of the following factors:

- The project will not be implemented in the entire forest range but in selected villages within the project ranges.
- It was found difficult to estimate the population of STs under the project Ranges since the Census data is on a village/development block/district level whereas forests are managed administratively on a Range/Division basis and the Forest Range may overlap over one or more development blocks.

However, the total number of STs within each of the identified priority range for the project has been estimated based on Census, 2011 (Table 7.2.1) overlaying GIS layers to establish the location of villages within the Forest Ranges and then estimating the ST population within each Range.

Finally, it should also be noted that this table does not include Van Gujjars.

Table 7.2.1: Scheduled Tribes in the Project Area – Indicative

	Forest Divisions	Total Pop.	ST Pop.	%	Likely/Main Tribal Group(s)
Non-Territorial Divisions					
	Alaknanda				
1	Asersimli Range	60,260	184	0.0031	Bhotia/Buksa
2	Attagad Range	38,675	147	0.0038	
3	Tharali Range	54,097	109	0.0020	
	<i>Sub-total</i>	153,032	440	0.0029	
	Civil and Soyam Almora				
4	Gananath range	79,359	221	0.0028	Bhotia
5	Jageshwar Range	52,492	15	0.0003	
6	Kosi range	64,604	526	0.0081	
	<i>Sub-total</i>	196,455	762	0.0039	
	Civil and Soyam Pauri				
7	Pabo Range	58,634	33	0.0006	Bhuksa/Bhotia
8	Pauri Range	60,264	171	0.0028	
9	Satpuli Range	35,793	16	0.0004	
	<i>Sub-total</i>	154,691	220	0.0014	
	SC* Lansdowne				
10	Chalusain Range	25,584	17	0.0007	Bhuksa/Bhotia/Tharu
11	Jaiharikhal Range	36,181	49	0.0014	
12	Matiyali Range	81,835	780	0.0095	
	<i>Sub-total</i>	143,600	846	0.0059	
	SC* Nainital				
13	Mukteshwar Range	75,784	147	0.0019	Tharu/Bhuksa/Bhotia

Tolia, R.S., 2008; Great Tribal Diversity of Uttarakhand.

Pant B.R., 2010; *Tribal Demography of Uttarakhand*, ENVIS, BULLETIN: Himalayan Ecology, Vol -18, 1-9

Uttaranchal Watershed Management Directorate, 2004; *Indigenous Peoples Plan/Tribal and Transhumant Strategy for Uttaranchal Decentralised Watershed Development Project*. World Bank Project website:

Saklani, B., undated (approximately 2002); *Baseline Survey of Bhoxa Tribe – A Primitive Tribal Group of Garhwal Region, Uttaranchal*.

Directorate of Tribal Affairs, 2006; *Baseline Survey of Buxa and Raji Primitive Tribal Groups in Nainital, US Nagar and Champawat Districts of Uttaranchal*.

	Forest Divisions	Total Pop.	ST Pop.	%	Likely/Main Tribal Group(s)
14	Okhalkanda Range	30,540	12	0.0004	
15	Ramghar Range	64,252	232	0.0036	
	Sub-total	170,576	391	0.0023	
	SC* Ramnagar				
16	Dhumakot Range	15,510	2	0.0001	Bhuksa/Bhotia/Tharu
17	Nainidanda Range	15,658	7	0.0004	
18	Ringlana Range	26,759	39	0.0015	
	Sub-total	57,927	48	0.0008	
	SC*Ranniket				
19	Chanthria Range	25,902	36	0.0014	Bhotia/Raji
20	Gagas Range	46,993	101	0.0021	
21	Gairsain Range	41,902	57	0.0014	
	Sub-total	114,797	194	0.0017	
	Tehri Dam I				
22	Dharkot Dam Range	57,395	66	0.0011	Jaunsari/Bhotia
23	Nailchami Dam Range	66,555	31	0.0005	
	Sub-total	123,950	97	0.0008	
Territorial Divisions					
	Bageshwar				Bhotia
24	Bageshwar	75,784	411	0.0054	
25	Dharamgarh	53,959	449	0.0083	
26	Kapkot	53,101	823	0.0155	
	Sub-total	182,844	1,683	0.0092	
	Champawat Forest Div				
27	Bhingrara	25,621	7	0.0003	Tharu/Bhuksa
28	Debi Dhura	50,198	42	0.0008	
29	Lohaghat	55,444	95	0.0017	
	Sub-total	131,263	144	0.0011	
	Narendranagar				
30	Maniknath Dangchura	106,059	204	0.0019	Jaunsari/Bhotia
31	Saklana Chamba	68,195	155	0.0023	
32	Shivpuri	46,386	43	0.0009	
	Sub-total	220,640	402	0.0018	
	Pitthorgarh				
33	Didihat	85,385	1,083	0.0127	Bhotia/Raji
34	Gangolihat	74,941	25	0.0003	
35	Pithoragarh	104,986	526	0.0050	
	Sub-total	265,312	1,634	0.0062	
	Mussoorie Forest Div				
36	Mussoorie	41,356	263	0.0064	Jaunsari
37	Raipur	90,693	712	0.0079	
	Sub-total	132,049	975	0.0074	
	TOTAL	2,047,136	7,884	0.0039	

*SC: Soil Conservation Division

Source: Compiled by JICA Preparatory Survey Team

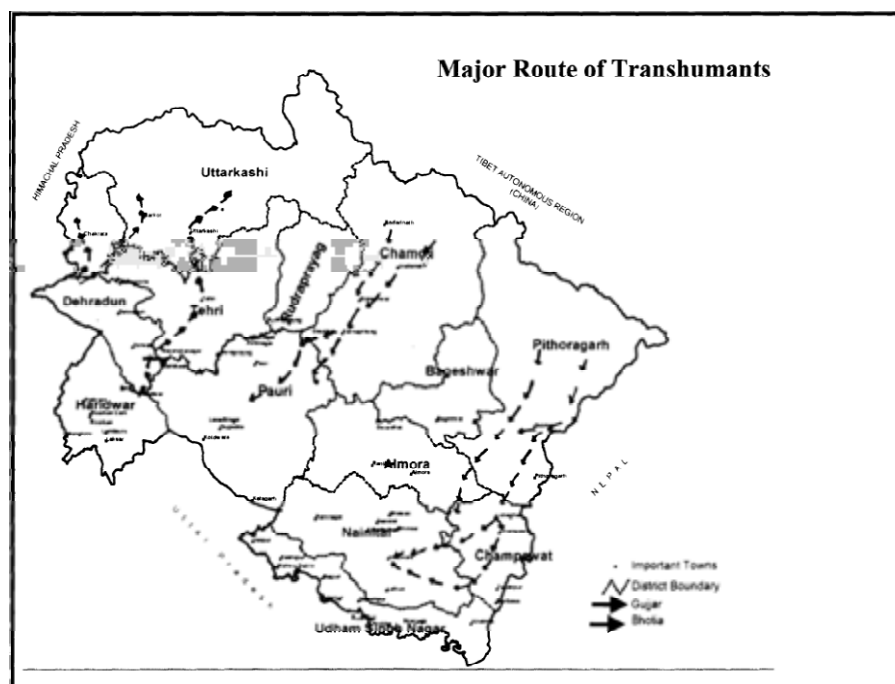
Table 7.2.1 shows that the number of STs in the priority ranges is 7,884 persons, representing only a tiny fraction (less than 0.004%) of the total population in these areas. The Divisions with the largest populations of STs are Bageshwar, Pithoragarh and Mussoorie (all Territorial Divisions) – 54% of all STs fall within these 3 divisions. Civil and Soyam Lansdowne is the non-territorial division with the highest population of STs. Overall though ST communities are dotted throughout the project area and since the project will be implemented across a broad belt of the State, it is possible that the project will interact with all ST groups at some point or other in the different locations.

Under its biodiversity conservation sub-component the project proposes to establish Biodiversity Heritage Sites (BHS) but the location and size of these sites is not given at this stage and it is extremely likely that such BHS are identified at different sites across the project area. Activities under the Biodiversity Conservation and Management sub-component are of particular concern because they are likely to be implemented in high alpine wetlands and may involve restrictions on access and use of resources at sites customarily used by STs e.g. for livestock grazing.

7.2.2 Transhumants

Transhumants are nomadic pastoralist communities whose livelihoods are based on seasonal migration with their livestock between the hilly Shiwaliks during the winter (November – February) and the alpine pastures in the summer (March – September). There are two main groups of transhumants in the project area; i) the Bhotia, a recognized ST with established concession and grazing rights and ii) the Van Gujjars. The migratory routes of these two groups are shown in the diagram below. **The Bhotias** are settled at high altitudes and although some groups have now become entirely settled, traditionally migrate with their herds of livestock (goats and sheep) down into the hilly Shiwaliks during the winter months. There are two traditional migratory routes as shown in the diagram above. The routes generally take around 3-4 months to complete with the shepherds leaving their families in September with their livestock for the lower pastures in September and beginning the return in February/March. There is frequent deviation from exact traditional routes depending on the situation at the time.

The Bhotia have established traditional grazing rights (no land rights) recognized by the UKFD from October – March (6 months). The legal arrangements apparently vary from forest division to division. Free grazing is allowed inside Reserved Forest (RF) up to the carrying capacity, although with certain control measures and regulations implemented by the UKFD staff (cattle enumeration and marking, a system of grazing permits etc). It was believed that such arrangements would create a sense of responsibility among themselves and they would abstain from destructive lopping practices.



Source: Tribal and Transhumants Strategy, Uttarakhand Decentralized Watershed Development Project (Watershed Management Directorate, 2004)

Figure 7.2.1 Major Routes of Transhumants in Uttarakhand

Van Gujjars, in contrast to the Bhotia tend to establish their main dwellings in the forested lowland areas and migrate with their buffalo to the alpine pastures during the summer months. The Van Gujjars however are not considered STs and in fact have no recognized land rights anywhere. The Van Gujjars are almost entirely dependent on their livestock for their livelihoods, unlike many other nomadic pastoralists including the Bhotia (who are simultaneously engaged in agricultural production).

Historical studies of the Van Gujjars indicate they have been excluded, treated unfairly and that they have been regarded as a 'problem' ever since the British colonial period and the first attempts to systematically organize society around a model of settled agricultural and forestry production based on administrative divisions. The fact that the Van Gujjars do not 'belong' anywhere within this societal

framework means they are constantly regarded as intruders and conflict with settled communities and the State have increased. Since the British colonial times there have been various attempts to control and restrict herd sizes, grazing areas, and the Van Gujjars have been subject to fees payable to the forest department for forest produce as well as fines and other fees levied.

In fact, the role of these transhumants has been recognized both in ecological and socio-economic terms they migrate from the dry lowland forests in the summer which cannot sustain their buffaloes, allowing such forests to recover while the herds are moved to upland pastures, which in turn utilizes otherwise unused pastures for the production of milk and other products, needed by upland communities. Thus an uneasy tolerance has been maintained over time and Van Gujjars are allowed to continue their migrations on humanitarian grounds, as opposed to an explicit recognition of their rights. Although the pure nomadic livelihood has become increasingly constrained over time (e.g. population pressures bringing them into conflict with newly established settlements over resource user rights or even previous temporary stop-over grazing spots being reduced as land is converted to agriculture), the Van Gujjar way of life remains today.

The latest and greatest threat to Van Gujjars livelihood security however is biodiversity conservation as communities are threatened with eviction from their forest dwellings in the lowlands (e.g. Rajaji National Park) and simultaneously prevented from grazing in conservation areas such as Govind National Park in the high alpine regions –a classic case of being victims of conservation (Nusrat, 2011³; Gooch, 2009⁴). The UKFD has a track record of trying to evict and settle the Van Gujjars, while no forest land rights have been recognized under the FRA in Uttarakhand.

To give some idea of scale of the Van Gujjar issue and based on a comparison of various studies⁵ of the Van Gujjars, it is possible to estimate their population size and the extent to which they will be impacted by the project. Firstly, the Van Gujjars traditional territory is within Rajaji National Park and surrounding forests with an official total population of 1,390 families based on a survey in 1998:

Table 7.2.2 Van Gujjars Population

No.	Forest Range	1998 Population (No. of Families)
1.	Haridwar	254
2.	Chilla	193
3.	Motichur	116
4.	Kansrao	85
5.	Chillawali	260
6.	Dholkhand	234
7.	Ramgarh	99
8.	Gohri	149
	TOTAL (families to be rehabilitated)	1,390

Source: Joshi, 2009

The above table shows that the Van Gujjar population is found entirely within and on the periphery of the Rajaji National Park and within forest ranges in which the project is not working. The above population figures are contested by the Van Gujjars themselves. According to the Park Management Plan (2012-2023), 190 households have refused to be moved. Meanwhile an additional 1,610 have

³ Nusrat, R. 2011. *Marginalisation of Himalayan Pastoralists and Exclusion from their Traditional Habitat: A Case Study of the Van Gujjars in India*. In Sarkar, S (ed), 2011. International Journal of Human Development and Sustainability. Volume 4, Number 1. Asian School of Management and Technology, India.

⁴ Gooch, P. 2009. *Victims of Conservation or Rights as Forest Dwellers: Van Gujjar Pastoralists between Contesting Codes of Law*. Conservation and Society 7(4): 239-248, 2009.

⁵ Sharma, J., Gairola, S., Gaur, RD. & Painula, RM. 2012. *Forest utilization patterns and socio-economic status of the Van Gujjar tribe in sub-Himalayan tracts of Uttarakhand, India*. Forestry Studies China, 2012,14(1): 36-46

Singh, ES. 2003. *Muslim Van Gujjars of Rajaji National Park in Uttaranchal, India*

Nusrat, R. 2011. *Marginalisation of Himalayan Pastoralists and Exclusion from their Traditional Habitat: A Case Study of the Van Gujjars in India*. In Sarkar, S (ed), 2011. International Journal of Human Development and Sustainability. Volume 4, Number 1. Asian School of Management and Technology, India.

registered their claims in a 2009 survey contesting the Park population figures. This indicates there may be around 2,000 families who have not been rehabilitated and who are thus continuing a traditional lifestyle (as well as others who have been settled but continue to maintain a semi-nomadic lifestyle). Although the Van Gujjars winter 'homes' in/around Rajaji will fall outside of the project area, their migration routes will certainly cross the project area in Dehradun, Tehri and Uttarkashi, and there is the possibility that their summer pastures could be affected by biodiversity conservation measures under the project, a serious safeguard issue especially considering they have already been excluded from areas such as Govind National Park.

7.2.3 Definitions and Interpretations

The first issue relating to the implementation of JICA's safeguard policies in the project is in clearly understanding the relevant terms, their meanings in the Indian context and thus the basis of any safeguards framework to be developed.

The JICA Preparatory Survey Team has been requested to advise the UKFD on the development of a Forest Dwellers Development Framework (FDDF) and to follow the World Bank (WB) Operational Policy on Indigenous Peoples (OP 4.10) for preparation of an Indigenous Peoples Planning Framework (IPPF) in doing so. On the one hand, 'Forest Dweller' is a specific term defined in the Indian Forest Rights Act which refers to a group or individual who either resides in a forest area or who is directly dependent on forest resources for their bona fide livelihood needs. On the other hand, indigenous peoples are defined by the WB as being socially or culturally distinct, and having their own customs, languages and institutions distinct from the majority of the population. Therefore, although there is often overlap, it is possible to be a forest dweller without being a member of a distinct cultural group and it is possible to be a member of a distinct indigenous cultural group without living in a forest. Thus, the two terms cannot be interchangeable when applying JICA/WB policies in the Indian context.

Since the proposed project will be implemented exclusively in forest areas and almost entirely implemented through community forest institutions, it means that by definition such communities are forest dependent.

The term "forest dwellers" have a specific definition and legal connotation in India. If a person is certified as a "forest dweller" legally, he/she has all the right over the forestland. Since most of the forest dependents in Uttarakhand do not have the certification and vested the rights officially, it is deemed inappropriate to use the term "forest dwellers" for the framework that the JICA Preparatory Survey Team was asked to prepare. Given the loaded nature of the term forest dwellers, it was decided the term FDDF shall be dropped. Instead, it was decided that the Environmental and Social Management Framework (ESMF) will be prepared. ESMF is a broad environmental and social framework protecting local communities and the surrounding forest ecosystems and habitats on which they depend.

Next, the safeguards framework must specifically address the issue of indigenous peoples. The term indigenous peoples is not used in the Indian constitution or law and therefore in terms of applying JICA's safeguard policies on indigenous peoples in the UFRMP context, a reasonable equivalent must be found. Following WB OP 4.10, indigenous peoples may be referred to in different countries by such terms as "indigenous ethnic minorities," "aboriginals," "hill tribes," 'minority nationalities', 'scheduled tribes', or 'tribal groups'. Therefore, in the Indian context it appears to be accepted that the Scheduled Tribes (STs) is the most relevant equivalent term. Hence, where the project may affect STs, additional and special provisions will be included in the safeguards framework to ensure; their adequate consultation, equal opportunities to participate in the project, that such peoples are not adversely affected by implementation and that they receive culturally appropriate benefits. Thus, in

addition to the ESMF, STTPF will be provided. The STPPF will follow the same format as the World Bank IPPF⁶.

It should be noted that Scheduled Castes (SCs) who are often considered within a similar bracket as STs in the Indian constitution and legal framework are not however considered to be ‘indigenous peoples’ since they occur in all parts of India and throughout Indian society – it is more related to social status than a separate or distinct cultural group. The broad EARF will contain measures to ensure that all vulnerable groups, including poor households, the landless, women and SCs have opportunities for effective consultation, participation, receive appropriate benefits and are overall not adversely harmed by the project.

7.2.4 Project Categorization and Treatment

The project has been categorized as a Financial Intermediary (FI) project by JICA for the following reasons as per the JICA Guidelines (2010):

1. The project funds will be provided to a financial intermediary or executing agency i.e. UKFD
2. The selection and appraisal of the sub-projects is substantially undertaken by the UKFD during implementation and the sub-projects cannot be specified prior to JICA’s approval of funding (or project appraisal). Although a reasonable idea of what the range of sub-projects will be is indicated in the DPR and further in this report, sub-projects will be selected in participatory mode by communities and as such cannot be specifically defined at this stage.
3. The sub-projects are expected to have some potential impact on the environment. As will be discussed below, sub-projects with significant adverse environmental or social impacts requiring environmental clearance will be eliminated through screening procedures. However, certain potential environmental and social impacts are perceived, and furthermore there is the potential that the project may involve sensitive ecosystems (e.g. important wetlands) and as mentioned above, Scheduled Tribes/Indigenous Peoples. Thus FI classification remains valid.

The primary focus of the UFRMP is on ecological rehabilitation of degraded forest lands, the conservation of ecologically sensitive areas as well as providing community development and livelihood improvement benefits to affected communities. As such it will have a mainly positive environmental and social impact. Moreover, sub-projects involving significant adverse environmental impacts (i.e. Category A and B or Category B1 as per the Indian legislations) and requiring environmental clearance will be eliminated, as will any sub-projects involving any resettlement, land acquisition or loss of livelihoods. It is therefore not necessary to treat the project as a Category A or Category B1 as per the Indian legislations requiring full environmental assessment and clearance under the JICA Guidelines (2010). Such sub-projects will be eliminated through project-specific screening procedures to be detailed in the ESMF. However, the project also cannot be treated as a Category C project (requiring no special provisions for environmental and social considerations), as although potential adverse environmental and social impacts as shall be demonstrated are assessed to be not significant (mostly Category C), there will be some impacts nonetheless, and moreover due to the fact that Scheduled Tribes and sensitive ecosystems may be present in the project area. The JICA Survey Team is thus bound to conclude that the most appropriate category for the treatment of the project overall is Category B.

There is seemingly no particular guidance offered by the JICA Guidelines on the requirements for an FI category project to be treated as Category B. The JICA Survey Team therefore proposes that whilst full-scale environmental assessment as per Category A is unnecessary, as discussed above a simple ESMF is required for the screening, management and mitigation of potential environmental and social risks arising, and a Scheduled Tribes and Transhumants Planning Framework (equivalent to IPPF) is also required for application in cases where such peoples are affected by the project.

⁶ Following Annex C of the World Bank Operational Policy 4.10.

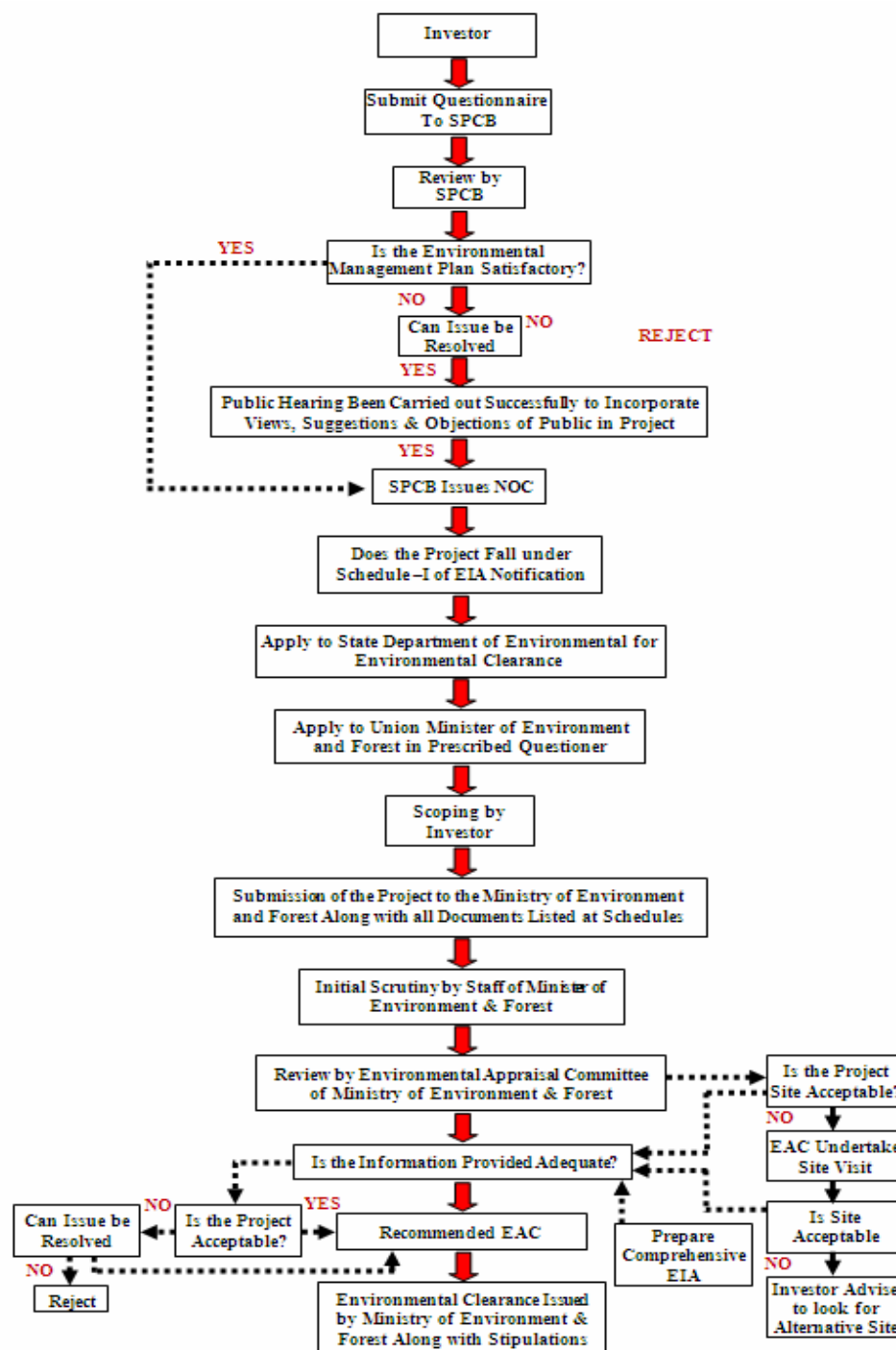
7.3 Existing Environmental and Social Management Systems

7.3.1 Environmental and Forest Clearance Procedures in India

The main project objective is the ecological restoration of degraded forest areas and thus it should have an overwhelmingly positive environmental impact. However, it is important to assess whether an adequate legal framework is in place for screening, avoiding and mitigating for any project activities which may have deleterious impact on the environment, especially forests and natural habitats.

India has a particularly strong legal framework protecting forests with clear procedural requirements for obtaining clearance to use forest lands or remove/fell trees. This legislation is also strongly implemented in practice and would be during the project. The Forest Conservation Act 1980 clearly defines procedures for obtaining clearance for activities on forest land and defines permissible activities without clearance i.e. those relating to the protection and development of forest stands (key activities to be undertaken in this project).

Table 7.3.1 EIA Procedure



Source: Dutta & Bandyopadhyay (2010)

The project may well have some other (non-forestry) potentially environmentally damaging activities and it is therefore necessary to ensure that the Indian legislative framework is broadly consistent with JICA guidelines. Following assessment of the legal framework it is considered that India has over the

last 10 years introduced significant legislative changes with respect to Environmental Assessment such that the procedures and standards in place are relatively consistent with international practices (see diagram illustrating EIA procedures⁷). This framework shall be sufficient for elimination of projects with significant adverse environmental impacts and this is not seen to be a major safeguard issue for the project.

As per the JICA Guideline, the FI category projects need to prepare Environmental Check List for their appraisal. A draft Environmental Check List was prepared by the JICA Survey Team as shown in **Attachment 7.3.1**, and draft Environmental and Social Management System (ESMS) Check List is shown in **Attachment 7.3.2**.

7.3.2 Environmental and Social Management Systems of the Executing Agency

The Executing Agency (EA), UKFD, does not have an adequate formal ESMS in place for the screening, management and monitoring of environmental and social risks of its standard operations and programmes. However, it was clear that certain elements of safeguards are included in some instances, based on discussions and interviews with UKFD staff both in Dehradun and at field sites as well as review of UKFD programme documents.

Where there is a dedicated government programme such as CAMPA or NAP, there are certain procedures and outputs which demonstrate there is some limited or partial level of information disclosure and consultation with communities, some community participation in the elaboration of micro plans (e.g. recent programme for Van Panchayat/ VP microplanning), there is participation of communities in implementation (usually as labor), and there is some evaluation of programmes including the assessment of the level/ mode of involvement of communities. However, procedures and standards are unclear and loosely implemented, monitoring is generally ad hoc and certainly the inclusion of environmental and social safeguards cannot be described as systematic.

The JICA Survey Team therefore concludes that for the purposes of the UFRMP, a more rigorous and systematic ESMS needs to be established for satisfactory implementation of the UFRMP as per the requirements of the JICA Guidelines. The standard loan agreement text states that the ESMS must be established before the project commences, and that the executing agency is required to demonstrate this before disbursement of the funds. However, since the project will not involve any sub-projects or activities with significant adverse environmental impacts and nor will it involve any loss of land, resettlement or significant loss of livelihoods, the JICA Survey Team proposes that it may be sufficient in this case that improvements to the ESMS can be made during the early phases of project implementation.

This recommendation is also based on internal guidelines on the application of JICA Guidelines for FI Category projects, which suggest that establishment of the ESMS during implementation is a possible course of action for first time loans. UKFD would need to commit to provisions for establishing an improved ESMS and implementation of the ESMF and STTPF as part of the loan agreement.

The draft ESMF and STTPF are shown in **Attachment 7.3.3** and **Attachment 7.3.4** respectively, and summaries of which are illustrated in this Chapter below.

⁷ From BK Dutta & S Bandyopadhyay, 2010. *Environmental Impact Assessment and Social Impact Assessment - Decision Making Tools for Project Appraisal in India*. International Journal of Human and Social Sciences 5:6 2010.

7.4 Recommended Draft ESMF Summary

7.4.1 ESMF Target Groups

The ESMF has been prepared to address environmental and social considerations of the project in accordance with JICA Guidelines. As the previous section underlined, the ESMF will be applicable to all forest dependent communities and peoples within the project area. From a social safeguards perspective this means the framework will be applicable for all villages and it will focus on ensuring that particular vulnerable groups are adequately consulted in local level project preparation, the design and development of micro plans, they are specifically included as beneficiaries, they receive appropriate benefits, their active participation during implementation, and that there are mechanisms in place to address any project-related grievances they may have. The table below indicates the groups the ESMF is aimed at protecting, although it should be noted that an individual or household may fall into more than one of the categories below.

Table 7.4.1 ESMF Target Groups

	Group	Description/Rationale
1	Poor/Below Poverty Line (BPL) Households	BPL households tend to be more dependent on forest resources and are thus disproportionately impacted by forest protection and development activities. For various reasons they may also be excluded from decision-making processes and equitable opportunities to benefit from development interventions.
2	Women and Female Headed Households (FHH)	The traditionally patriarchal society where men have <i>de jure</i> control over productive resources means women are often excluded from decision-making processes and/or that development interventions do not meet their needs. Due to male out-migration in many areas of rural Uttarakhand, women are also the ones primarily responsible for agricultural production and forest resource use and management. FHH are a particularly vulnerable sub-group with a typically limited asset base and high levels of forest dependency
3	Landless	The landless are often highly dependent on forest resources for their daily subsistence needs and as a safety net in times of duress. Development interventions can also often neglect this disadvantaged group as investments target farmers who have land and assets.
4	Scheduled Castes (SCs)	SCs are by definition socially disadvantaged and may be excluded due to innate cultural and social norms and practices. Moreover due to their often restricted access to land and other assets, they are less able to benefit from development interventions. Roughly 15-28% of the population in rural Uttarakhand are SCs.
5	Scheduled Tribes (STs)	STs are characterized by distinct cultural practices and institutions, their own languages, geographical isolation and shy of contact with outsiders. All of this can make consultation difficult and that they may have specialized needs and priorities. There are 5 recognized ST groups in Uttarakhand representing around 5% of the State population (see below).
6	Transhumants	Transhumants are not necessarily a distinct ethnic group or tribe, but they are characterized by a livelihood based on seasonal migration with cattle to grazing areas (where they have recognized customary rights). Such peoples' lives are closely tied to forests and natural resources and they have quite specialized needs.

Source: Compiled by JICA Preparatory Survey Team

7.4.2 Objectives of the Environment Social Management Framework

The objectives of the Environment Social Management Framework (ESMF) are:

- i) to provide a broad framework for the identification, management and monitoring of potential environmental and social risks arising under the project;
- ii) to enhance the project's positive environmental and social impacts and avoid or otherwise mitigate associated negative impacts;

- iii) to ensure that the rights and needs of forest dependent communities (in particular the most socially disadvantaged and vulnerable groups) affected by or involved in the project, are respected and met in the design and implementation of project interventions; and
- iv) to ensure the protection of local ecosystems and environmental resources in the design and implementation of project interventions.

7.4.3 Positive Environmental and Social Impacts of UFRMP

Table 7.4.2 Potential Positive Environmental and Social Impacts of UFRMP

Benefit Type	Project Benefits and Intended Positive Impacts for Forest Dwellers
Natural Capital Benefits	<ul style="list-style-type: none"> ✓ Improved forest quality and quantity – increased natural assets ✓ Improved environmental services derived from forests e.g. improved watershed protection, reduced soil erosion/run-off, hydrology, soil fertility/moisture etc
Financial Capital Benefits	<ul style="list-style-type: none"> ✓ Increased incomes ✓ Direct and indirect employment opportunities arising from project activities ✓ Diversification of income sources and reduced financial risk
Social Capital Benefits	<ul style="list-style-type: none"> ✓ Strengthened community institutions ✓ Improved connections and networks for producer groups ✓ Empowerment of women
Human Capital Benefits	<ul style="list-style-type: none"> ✓ Increased technical capacity for sustainable management of community forests ✓ Increased entrepreneurial and business management capacity of producer groups
Physical Capital Benefits	<ul style="list-style-type: none"> ✓ Construction/Rehabilitation of priority community infrastructure (e.g. access roads, irrigation and water harvesting structures, community centres etc.)
Vulnerability Context Benefits	<ul style="list-style-type: none"> ✓ Reduced vulnerability/increased resilience of communities to shocks (e.g. commodity prices, disasters) and trends (e.g. climate change)
Improved Structures and Processes	<ul style="list-style-type: none"> ✓ Increased participation in community development planning and activities ✓ Increased participation of local people in forest management ✓ Improved capacity of government departments and extension service delivery

Source: JICA Preparatory Survey Team

7.5 Recommended Draft Scheduled Tribes and Transhumants Planning Framework (STTPF) Summary

7.5.1 Objectives of the STTPF

STs and especially forest dwelling STs, may have very specific and/or specialized requirements. Thus, STTPF is additionally prepared to cover STs and transhumants as, if and where they may fall within the project area.

The objective of STTPF is to ensure that project activities are designed and implemented in a way that fosters full respect for the ST's and transhumants' identity and dignity, and safeguards their human rights, livelihood systems, and cultural uniqueness so that they (i) receive culturally appropriate social and economic benefits, (ii) do not suffer adverse impacts as a result of projects, and (iii) can participate actively in projects that affect them.

7.5.2 Positive Environmental and Social Impacts

Positive impacts for STs and transhumants are generally the same as for other communities and groups as indicated in table 7.4.1. Certain project benefits may need to be slightly adjusted for STs and transhumants, elaborated further in the STTPF itself. (**Attachment 7.3.4**)

7.5.3 Potential Adverse Environmental and Social Impacts

Potential adverse impacts are again generally similar to those for other communities and groups. However, there may be certain additional or specific impacts, particularly for transhumants, whose access and usufruct rights may be more contested than settled communities, or due to their greater dependence on natural resources STs and transhumants may be more affected by project interventions and certain mitigation measures may need to be adjusted accordingly. As indicated above, there are particular concerns related to resource use restrictions on transhumants (Bhotias and Van Gujjars) and the project may also affect some small pockets of PTGs (Buksas and Rajis), requiring sensitive approaches or measures. This is elaborated further in the STTPF itself.

7.6 Social Assessment Report

In order to comply with World Bank OP 4.10, the Social Assessment (SA) will have to be carried out by the executing agency and shall include specific recommendations resulting from consultations with STs and the provision of culturally appropriate benefits, when/where they fall within the project impact area. Whilst the ESMF will identify broad theoretical issues, the SA will help the project to identify more specific issues at the field level and recommend appropriate solutions accordingly for local implementation. The SA will be relevant to all forest dependent communities and particularly to the vulnerable groups within those communities. The STTPF includes further guidance for the implementation of the SA where STs and transhumants are involved.

The SA will be embedded into the microplanning process with the results from the participatory rural appraisal (PRA), livelihoods assessments and community consultations during the SA providing the fundamental basis for the subsequent development of appropriate micro plans for each village.

Table 7.6.1 Consultation and Participation in Social Assessment and Micro planning

Consultation Topic/s:	<ul style="list-style-type: none"> Land and forest management/use practices; livelihoods, agricultural production systems, sources of income, poverty levels, food security, resource dependency, community assets etc.
Purpose/Objective:	<ul style="list-style-type: none"> To gain a detailed understanding of local livelihoods, natural resource management systems and community development needs and priorities at the village level
Participants:	<ul style="list-style-type: none"> Implementers: VP Executive Committee (VPEC) members, FMUs, FNGOs, Animator PRA Participants: Villagers, women/female headed household groups, BPL group, SC group, ST groups, forest product user groups, forest guards, other officials
Time/Timing:	<ul style="list-style-type: none"> Following VP confirmation Social Audit may take around 2 days in each village for initial fieldwork plus a return visit for a half-day community meeting to verify findings and receive comments Microplanning may take a further 1-2 days per village
Approach:	<ul style="list-style-type: none"> PRA activities (including key informant interviews, focus group discussions, transect walks, participatory sketch mapping etc – see Social Audit Plan) with a variety of groups and individuals within the community Community meeting to verify findings and receive comments Separate consultations and community meeting for Micro plan preparation
Materials Required:	<ul style="list-style-type: none"> Flipcharts, pens, cards, 1:10,000 scale printed topographic maps and other stationery and materials for PRA activities Provision of simple/easy to read environmental and social impact summaries in Hindi Consultation and Participation Monitoring Sheets

Institutional Responsibilities:	<ul style="list-style-type: none"> • DMU/FMUs to coordinate Social Audit and micro planning with technical support from PMC • Formation of working groups consisting of individuals from FMU, FNGO, Animator and VP (women team members required) • PRA activities led by FNGOs, VPs to support coordination • FNGOs to organize meetings with VPs • VPs/Animators to encourage participation • VPs and FNGOs to record participants and meeting minutes
Special Notes:	<ul style="list-style-type: none"> • Results from the baseline household surveys may also inform the Social Audit. • FMUs/FNGOs need to be trained in Social Audit and micro planning skills prior to implementation • Micro plans need to be agreed to by affected transhumant groups

Source: JICA Preparatory Survey Team

The SA aspects within the micro plan will be integrated by the FNGO responsible. The micro plan will include the following contents:

- 1. Description of Project Impacts:** Based on consideration of the project's objectives and activities as well as the socio-economic/livelihoods assessment, describes potential positive and negative impacts of the project.
- 2. Vulnerable Groups:** Identifies and describes particularly vulnerable groups within the community and how they may be affected by the project, including the very poor (BPL households or households identified as very poor though participatory poverty ranking), women/female headed households, Scheduled Castes, landless, elderly, Scheduled Tribes etc.
- 3. Public Consultation and Information Disclosure:** Documents and presents results of public consultation events with the communities.
- 4. Conclusion and Recommendations:** Broad overall conclusions and recommendations from the assessment for project design and implementation in the locality (appropriate types of interventions, key opportunities/constraints, modes of implementation etc)
- 5. Mitigation Measures:** Identification of specific measures to avoid, minimize and/or compensate for project activities with adverse impacts on forest dependent communities and particularly vulnerable groups.

7.7 Recommended Procedures and Institutional Arrangements for Environmental and Social Considerations in UFRMP

The proposed framework for environmental and social considerations in UFRMP is shown in the table below.

Table 7.7.1 Overview of Procedures and Institutional Arrangements

Project Implementation Stage	Safeguard activities	Suggested Guiding documents to be developed
VPs/ Village Selection and Preliminary Consultation	<ul style="list-style-type: none"> • Selection of VPs/ Village • Information Disclosure and Free Prior Informed Consultation • Establishment of broad community support 	<ul style="list-style-type: none"> • VP selection criteria reflecting the social-environmental safeguard perspective • Consultation and Participation Plan
Baseline Surveys	<ul style="list-style-type: none"> • Social Assessment 	<ul style="list-style-type: none"> • Social Assessment Plan

Project Implementation Stage	Safeguard activities	Suggested Guiding documents to be developed
Micro Planning and Sub-project Development	<ul style="list-style-type: none"> Process of micro plans to be participatory to reflect on the voices of the community members Screening and selection of the activities with reference to the safeguard checklist Participatory Environmental and Social Assessment (ESA) for confirmation of the screening results and finalization of the activities to be undertaken by each VP Site visits by DMU and safeguards experts/ technical staff of government agencies 	<ul style="list-style-type: none"> Micro Planning Guidance Note Participatory ESA format
Forest Management Planning (Working Plans/Composite Plans)	<ul style="list-style-type: none"> Ensuring participation of local people in forest management planning activities 	<ul style="list-style-type: none"> Forest Management Planning Guidance Note/Guidelines
Sub-project Implementation	<ul style="list-style-type: none"> Community participation in project activities 	<ul style="list-style-type: none"> Beneficiary Selection Guidance Note Guidelines for specific activities e.g. on use of pesticides/fertilizers, chemicals in NTFP processing etc. (if required, to be developed during implementation)
Monitoring and Reporting	<ul style="list-style-type: none"> Through participatory M&E mechanism the impact of the project activities will be monitored by VPs with help of FLEs/ FNGOs 	<ul style="list-style-type: none"> Participatory M&E Guidance Note Monitoring Sheets
Grievance Procedures	<ul style="list-style-type: none"> Through the project's institutional structure 	<ul style="list-style-type: none"> Institutional responsibilities for addressing grievances

Source: JICA Preparatory Survey Team

7.8 Capacity Development Requirements

This section addresses the institutional capacity of FD staff at different levels as well as VPs and NGOs for the implementation of the above-proposed procedures for consideration of environmental and social issues.

In broad terms the project aims to strengthen VPs and the concept of community based forest management in general. Collaborative and community based forest management approaches and concepts by their very nature require the deployment of knowledge and skills relevant to the consideration of environmental and social issues among forest dependent communities. On the one hand, community based forest management requires empowering the VPs by building awareness of their rights and responsibilities in forest management as well as their capacity to manage and implement forestry and community development activities on lands within and adjacent to their communities. Since UFRMP implementation will be facilitated by FNGOs supporting VPs at grassroots levels, it will also be necessary to build their capacity to perform this role. On the other hand, it also requires building the capacity of the UKFD to implement more inclusive and participatory approaches to forest management.

In addition to the knowledge and skills required for participatory approaches to forest management, certain specialized knowledge and skills will be required for operationalising the above proposed procedures for assessing and screening environmental and social impacts as well as implementing and monitoring safeguards measures. The table below indicates key knowledge/skill areas required. It is acknowledged that particularly for UKFD, different knowledge and skills sets are required at different

management levels (i.e. field skills versus administrative/management skills) – these will be drawn out in the environmental and social safeguards capacity development and training proposed below.

Table 7.8.1 Knowledge and Skills Requirements for Participatory Forest Management and Environmental/Social Safeguards

<ul style="list-style-type: none"> • Environmental and Social Impact Assessment - Principles and Theory • Environmental Protection and EIA legislation • Social Safeguards Legislation • Free, Prior and Informed Consultation • Sociologies of Scheduled Tribes, Scheduled Castes, Women, Landless and Other Vulnerable Groups • Gender Equality and Equity • Community Facilitation/Participatory Planning • Environmental Screening Procedures for UFRMP • Participatory ESA for UFRMP • Participatory M&E (general and project-specific) • Grievance Procedures
--

Source: JICA Preparatory Survey Team

7.9 Safeguard Monitoring

The project as a whole and the safeguards frameworks require certain outputs relevant to ensuring that environmental and social safeguards have been observed are produced e.g. demonstrating that broad community support for the project. Therefore indicators are required to measure the utilization and quality of the safeguard processes. The table below presents output and process indicators for demonstrating and measuring that safeguards measures have been implemented in each set of UFRMP processes and stages.

Table 7.9.1 Output and Process Indicators for Safeguards Monitoring and Evaluation

	Stage	Indicators	Means of Verification
1.	Information Disclosure and Establishment of Broad Community Support	<ul style="list-style-type: none"> • No. of VP men, women, BPL, SC and STs attended community meeting • % of interviewees satisfied with information disclosure process 	<ul style="list-style-type: none"> • Community resolution • Voting records
2.	Social Assessment	<ul style="list-style-type: none"> • No of men, women, BPL, SC/STs consulted in PRA 	<ul style="list-style-type: none"> • Social Assessment Reports • Gender Assessment Report
3.	Microplanning	<ul style="list-style-type: none"> • No of men, women, BPL, SC/STs consulted in microplanning • % of interviewees satisfied with micro plans 	<ul style="list-style-type: none"> • Micro plans • STTPPs
4.	Sub-project Selection and Screening	-	<ul style="list-style-type: none"> • Lists of community sub-projects
5.	Sub-project Implementation	<ul style="list-style-type: none"> • No./% of women, BPL, SC/ST beneficiaries • % of interviewees satisfied with beneficiaries selected 	<ul style="list-style-type: none"> • BMCs, SHGs established • Ecotourism Plans/Strategies
6.	Monitoring and Evaluation	<ul style="list-style-type: none"> • No. of VP men, women, BPL, SC and STs attended community meeting 	<ul style="list-style-type: none"> • Monthly, Quarterly, Annual monitoring forms • Social audit reports
7.	Grievance Procedures	<ul style="list-style-type: none"> • No of grievances submitted • No of grievances resolved • % of interviewees aware of and satisfied with grievance mechanism 	<ul style="list-style-type: none"> • Grievance forms

Source: JICA Preparatory Survey Team

Chapter 8 RECOMMENDATIONS ON PROCUREMENT AND IMPLEMENTATION METHOD

8.1 Overview

Since this project will be implemented through people's participation, the major portions of project activities, especially the eco-restoration component and IGA components, will be carried out by the people themselves in a form of village level organizations, namely Van Panchayat (VP), Biodiversity Management Committee (BMC) and Self-Help Groups (SHGs). The work will be entrusted to those people's organizations through some kind of contract, as Memorandum of Association (MOU).

At the same time, certain project works need to be implemented by the Executing Agency directly, such as NTFP plantation within the Reserved Forests, construction of UKFD's field offices and nurseries, etc.

Other technical activities will be carried out by specialized agencies and firms, as various surveys/ studies, construction of large structures as PMU/NCE buildings and sediment disaster mitigation measures. Specialised support activities under the project will be outsourced also to marketing support agencies, NGOs, Project Management Consultants (PMC) and training institutions. Those outsourced agencies will be procured through local, national or international tender. For the international bidding, the project must comply with JICA's procurement guideline.

Under the project, a number of goods will be procured also. The procurement should follow the guidelines of the state government.

8.2 Proponent – Executor & Owner – Contractor

The details of project component-wise Proponent – Executor of activities, Owner – Contractor of contracts and modus operandi are summarized in the table below:

Table 8.2.1 Project Proponent, Owner, Executor and Modus Operandi

Main Activity	Proponent/ Owner	Executor/ Contractor	Modus Operandi
Component 1: Eco Restoration			
Sub-Component 1.1: Rehabilitation of Degraded Forest	DMU	VPs	MOU
Sub-Component 1.2: NTFP Plantation	DMU	FMU	Direct Undertaking
Sub Component 1.3 Biodiversity and Wildlife Management			
- Sacred Grove Conservation	State Biodiversity Board	BMC	MOU
- Capacity Building of Village Level Organizations (preparation of PBRs, etc.)	PMU	State Biodiversity Board (the work may be sub-contracted to specialized agencies)	MOU
- Human and Animal Conflict Management	PMU	Forest divisions or specialized agency, such as WII	Direct Undertaking or MOU/ Local Bidding (if not government agencies)
Sub-Component 1.4: Other Eco-Restoration Activities	PMU	PMU	Direct Undertaking

Main Activity	Proponent/ Owner	Executor/ Contractor	Modus Operandi
Component 2: Livelihood Improvement and Community Development			
Sub-Component 2.1: Community Mobilizing and Micro Planning			
2.1.1 Micro Planning	PMU	FNGO	Local Bidding
2.1.2 Deployment of Animator	VP	Animator	Nomination by the General Body of VP
2.1.3 Survey of 1st batch project sites (outsourcing)	PMU	Specialised Agency	Local Bidding
2.1.4 Engagement of Field NGO	PMU	FNGO	Local Bidding
Sub-Component 2.2: Entry Point Activities (EPA)/ Basic Human Needs (BHN) Improvement/ Community Disaster Relief			
2.2.1 EPA			
- Construction of VP Office/ Disaster Relief Centre	DMU	DMU	Local Bidding or Direct Implementation
- Livelihood / Convergence	DMU	VP or FNGO	MOU
Sub-Component 2.3: NTFP-Based IGA			
2.3.1 Establishment of NTFP Centre for Excellence	PMU	Contractor	Local Bidding
2.3.2 Enterprise development	NCE	SHG Federations/ Cooperatives/ Producers Companies/ SHGs	MOU
2.3.3 Procurement of goods and materials	PMU, DMU	Suppliers	Price Quotation
Sub-Component 2.4: Ecotourism			
2.4.1.1 Destination Development (small)	DMU	VP/ BMC	MOU
2.4.1.2 Destination Development (large)	PMU	Contractor	Local Bidding
2.4.2 Institutional support	PMU	Contractor	Local Bidding
2.4.3 Procurement of goods and materials	PMU, DMU	Suppliers	Price Quotation
Sub-Component 2.5: Non-NTFP Based IGA			
2.5.1 Enterprise Development	DMU	SHG Federations/ Cooperatives/ Producers Companies/ SHGs	MOU
2.5.2 Procurement of goods and materials	PMU, DMU	Suppliers	Price Quotation
Component 3: Other Support Activities			
Sub-Component 3.1: Preparatory Works			
3.1.1 Logistic support of PMU	PMU	Suppliers	Price Quotations
3.1.2 Logistic support of DMUs	PMU/ DMU	Suppliers	Price Quotations
3.1.3 Logistic support of FMUs	PMU/ DMU/ FMU	Suppliers	Price Quotations
3.1.4 Logistic support of Circles	PMU/ Circle	Suppliers	Price Quotations
3.1.5 Logistic support of VPs	DMU/ FMU/ VP	Suppliers	Price Quotations
3.1.6 Strengthening of GIS Laboratory	PMU	Suppliers	Price Quotations
3.1.7 Construction of PMU building	PMU	Contractor	Local Bidding
3.1.8 Extension of DMU office buildings	DMU	DMU/ FMU	Direct Undertaking
3.1.9 Extension of FMU office buildings	DMU	FMU	Direct Undertaking
Sub-Component 3.2: Capacity Building of Executing Agencies and Other Stakeholders	PMU/ DMU/ FMU	Resource Organization/ Resource Persons	Local Bidding/ Advertisement
Sub-Component 3.3: Capacity Building of Village Level Institutions	PMU	DMU/ FNGO	Direct Undertaking

Main Activity	Proponent/ Owner	Executor/ Contractor	Modus Operandi
Sub-Component 3.4: Applied Research and Publicity	PMU	PMU, FD Research Wing, research institutions, etc.	Direct Undertaking/ Direct Order
Sub-Component 3.5: Monitoring and Evaluation			
3.5.1 Baseline Survey (Socio Economic)	PMU	Contractor	Local Bidding
3.5.2 Baseline Survey (Physical)	PMU	Contractor	Local Bidding
3.5.3 GIS mapping (outsourcing)	PMU	Contractor	Local Bidding
3.5.4 Ad hoc assessment Studies	PMU	Contractor	Local Bidding
3.5.5 Mid-End Term Evaluation (Socio Economic)	PMU	Contractor	Local Bidding
3.5.6 Mid-End Term Evaluation (Physical)	PMU	Contractor	Local Bidding
3.5.7 Establishment of MIS/ FMAS software	PMU	Contractor	Local Bidding
3.5.8 Annual Review at Division level	DMU	FMU and VP	Direct Undertaking
3.5.9 Annual Review at State level	PMU	PMU	Direct Undertaking
3.5.10 Monitoring & Periodical Reviews	PMU	DMU, FMU	Direct Undertaking
3.5.11 Social Audits	DMU	VPs	Direct Undertaking
3.5.12 Grievance Redressal	Circle	Circles	Direct Undertaking
3.5.13 Publicity & Publication	PMU	Suppliers	Price Quotation
3.5.14 National Level Workshop	PMU	PMU	Direct Undertaking
Sub-Component 3.6: Project Continuity Strategy			
3.6.1 Updation of micro plans	DMU	VPs	MOU
3.6.2 Proposal preparation	PMU	PMU	Direct Undertaking
Component 4: Erosion Control and Sediment Disaster Mitigation			
Sub-Component 4.1: Slope Stabilization and River Training	PMU	Contractor	Local Bidding
Sub-Component 4.2 : Construction of Emergency Shelters	PMU	Contractor	Local Bidding
Sub-Component 4.3: Overseas Training on Disaster	PMU	PMU	Direct Undertaking
Component 5: Consulting Services			
Project Management Consultancy (PMC)	PMU	Consultants	International Competitive Bidding
Others			
Engagement of Contractual Project Staff	PMU, DMU	Contractual Staff	Advertisement

Source: JICA Preparatory Survey Team

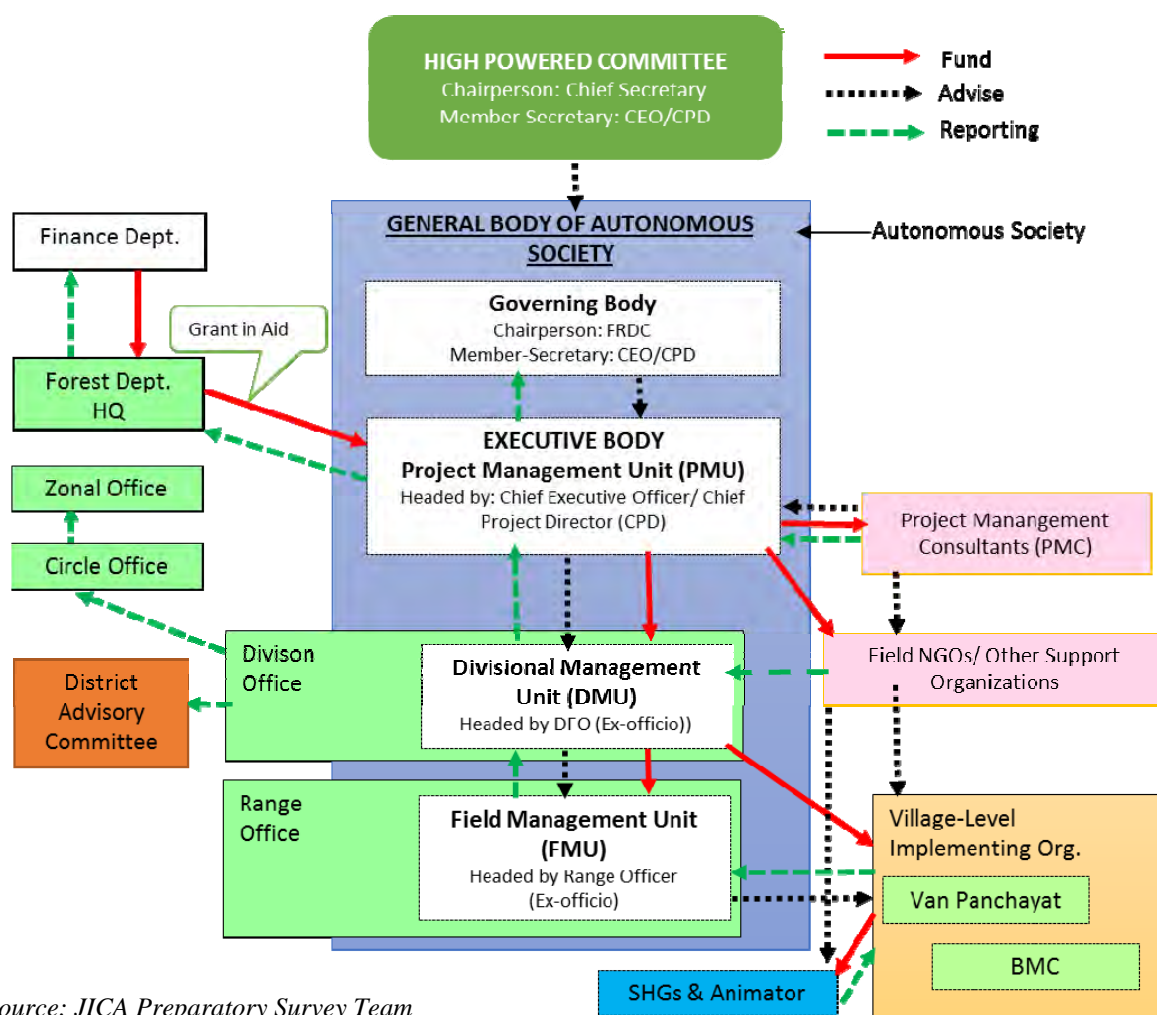
Chapter 9 ANALYSIS OF PROPOSED INSTITUTIONAL FRAMEWORK AND RECOMMENDATIONS

9.1 Executing Body, Implementation Mechanism and Staff Augmentation

For efficient management of any time-bound project, an autonomous and dedicated administrative set-up is of paramount importance to achieve the project purpose and outputs within given time-frame and resources. To make the fund flow more efficient and for timely submission of reimbursement claims, adequate authority to take prompt decisions and stimulate processes has to be given to key persons who are directly responsible for managing project activities.

Taking lessons from similar JICA supported forestry projects in the country and understanding the requirements of the UKFD, project institutional framework has been evolved and proposed. Besides, inputs from the stakeholder's consultation workshop are also considered, particularly for suggesting the constitution of Governing Body of the autonomous society.

Project Management Unit (PMU) would made be responsible to manage, coordinate and implement the proposed activities. All offices created for this project will exclusively work and implement proposed project activities following the implementation schedule and envisaged processes. The Figure below shows the detailed institutional arrangement envisaged for the implementation of the Project.



Source: JICA Preparatory Survey Team

Figure 9.1.1 Organizational Setup for Project Implementation

The project implementation bodies (PMU, DMU and FMU) will be created through a State Resolution (Government Order/ Notification) and would get registered as autonomous society under Societies Registration Act, 1860, as applicable in the state, with its Memorandum of Association and Bye-laws stipulating the following:

- 1) Name of Society
- 2) Location and area of operation
- 3) Aims and objectives of the society
- 4) List of membership of the society (General Body)
- 5) List of members of the Governing Body
- 6) Executive Offices, officers and their functions
- 7) Operation of Funds and Accounts of the society
- 8) Audit of accounts

To support project implementation at the field level, PMU of the autonomous society at the state level will coordinate with two offices viz., Divisional Management Units (DMUs) and Field Management Units (FMUs) – to be created within existing division and range offices respectively and will operate within their jurisdictions. Mechanism/ arrangement would be evolved by PMU for tracking the project implementation, reporting and fund flow for the sub-components such as human animal conflict, sediment disaster mitigation measures, etc. that would be implemented outside the 37 priority ranges without FMU.

The Forest Department being the main executing agency to first receive funds from the state government, will also be committed to support project implementation through various established offices located at state, region, circles, divisions, range etc. as per administrative structure of the department.

PMU will have a comprehensive Operation Manual that would prescribe guidelines, policies, protocols, procedures and rules on finance, administration and management for the smooth implementation of the Project. This Operation Manual will convey the internal policy of the PMU (Society) to manage the project and would be approved by the High Powered Committee (HPC) to be impartial of existing departmental administration rules and regulations. The UKFD and the PMU (Society) will enter into an agreement to vest the project management responsibilities to the PMU.

9.2 Key Managerial Features of Institutional Arrangement

There are a number of key managerial features in order to make the institutional arrangement effective and to function within the framework of government systems.

9.2.1 Budgetary Provision

UKFD will take all necessary measures to secure the funds required for smooth implementation of the project, and there would not be any delay in implementation due in insufficient budgetary provisions of the annual project cost including state share.

9.2.2 Accounting Procedures

As per the institutional arrangement, the funds from the UKFD will be given to the PMU as grants and then the PMU will provide the funds to DMUs. The funds will flow from the State Government to the UKFD that would further provide the funds without any delays to the PMU (Society) as per the annual budget and plan approved by the High Power Committee (HPC). The PMU would ensure to adopt a uniform and unified accounting procedures based on double accounting principles at all level i.e. PMU, DMUs and FMUs. PMU would develop and adopt its accounting procedure in the first year of operation.

DMUs, FMUs, and Village Implementing Units viz., VPs and BMC that would receive funds need to operate separate Bank Account(s) in the nationalized banks for the Project. The funds from the PMU bank account will go to designated bank accounts of DMUs as per respective annual plan on quarterly

basis following available banking transaction options. DMUs would further provide the funds to FMUs and VPs/ BMCs as per their annual implementation plan.

(1) Auditing

Auditing will be carried out by the Auditor General (AG) as per the existing financial rules and procedures of the state government as applicable for the grants to any Society like PMU extended from the consolidated fund of state/ GoI.

Moreover, according to the Society Registration Act, a Society is required to have a statutory annual audit by a chartered accountant. Thus, annual statutory audits by Chartered Accountant (CA) would be carried out for the accounts of PMU, DMU, FMU and VPs/ BMC. Internal audits would also be done biannually for accounts of PMU, DMU and FMU on regular basis.

(2) Compliances of General Financial Rules and General Rules of Business

In order to have smooth compliances with General Financial Rules (GFR) and General Rules of Business (GRB) of Government of Uttarakhand, the PMU will have Finance Controller/ finance officers from the Uttarakhand Finance Service cadre who are familiar with GFR and GRB. It would also facilitate better coordination with the Finance Department for the Project implementation.

(3) Link with the State Government

The PMU will have one member from the Governing Body designated to act as constant link between the PMU and the state government, and facilitate functioning within the state government.

(4) Structural Integrity

The society will only be created for the implementation of the project (or other similar projects in future) and there is no intention of creating a dual administrative structure within the forestry sector in the state. The existing charges and authorities of UKFD will remain intact regardless of the creation of the PMU as autonomous society. In case the function of the society ceases, the assets and infrastructure of the Society (PMU, DMUs, and FMUs) created under the project will be transferred to UKFD through provisions in its bye-laws. This will ensure the organizational integrity of the society with UKFD.

9.3 Details of Components of Institutional Setup for Project Implementation

9.3.1 High Powered Committee (HPC)

A High Powered Committee (HPC) will be created within the State Government as the highest decision-making body for the Project. The HPC will meet at least once in six months or earlier if the situation arises. The composition of the committee will consist of the following members:

Table 9.3.1 Composition of High Powered Committee

	Position	Designated Person
1.	Chairperson	Chief Secretary
2.	Member	Forest & Rural Development Commissioner (FRDC)
3.	Member	Principal Secretary, Finance
4.	Member	Principal Secretary, Forest & Environment
5.	Member	Principal Secretary, Revenue
6.	Member	Principal Secretary, Panchayati Raj
7.	Member	Principal Secretary, Planning
8.	Member	Principal Secretary, PWD
9.	Member	Principal Secretary, Irrigation
10.	Member	Secretary, Disaster
11.	Member	PCCF (HOFF), Forest Department
12.	Member	PCCF (VPs & JFM), Forest Department
13.	Member	Additional Secretary, Forest & Environment

	Position	Designated Person
14.	Member	Special Secretary, Planning and Coordination
15.	Member-Secretary	Chief Project Director
16.	Special Invitee	JICA Representative
17.	Special Invitee	GoI/ MoEF Representative
18.	Special Invitee	PMC Representative

Source: JICA Preparatory Survey Team

The Operation Manual of the society for the project will be approved by the HPC. It will approve the annual plan and budget for the implementation of the project. Whenever necessary, HPC would give directions to the PMU for smooth and efficient project implementation and will pursue the matters relating to policy with the state government, and also facilitate inter-departmental coordination and convergence. HPC will also review the project progress every-six months.

It will accord administrative and financial sanctions to all individual schemes, proposals or contracts for procurement of goods & services amounting to INR 50 million & above. Details of the Roles and Responsibilities within Institutional set-up are given in **Attachment 9.3.1**.

9.3.2 Implementing Body

PMU (Society) would be located in state's capital Dehradun, and would take overall responsibility of the project implementation. Within the society Governing Body (GB), Executive Body (EB) and General Body will be created as per requirement of the Society Registration Act.

(1) Governing Body

Governing Body will be the highest decision-making body within the society. The composition of the Governing Body is shown in the table below:

Table 9.3.2 Composition of Governing Body

	Position	Designated Person	Remarks
1.	Chairperson	Principal Secretary, Forest & Environment	
2.	Member	Principal Secretary (Horticulture)	
3.	Member	Principal Secretary (Animal Husbandry/ Dairy)	
4.	Member	Secretary (Rural Development)	
5.	Member	Secretary (Irrigation)	
6.	Member	Additional Secretary (PWD)	
7.	Member	PCCF (HOFF), Forest Department	
8.	Member	PCCF (Wildlife), Forest Department	
9.	Member	PCCF (Projects), Forest Department	
10.	Member	PCCF (VP&JFM), Forest Department	
11.	Member	Chairperson, State Biodiversity Board	
12.	Member	Additional Secretary, Forest & Environment	To be designated to establish link between the PMU (Society) and the state government
13.	Member	Project Director, Finance Controller and Joint Project Directors of PMU	
14.	Member	Convenor, State Level Bankers Committee Uttarakhand or its representative	
15.	Member	Representative from NABARD	
16.	Member	VP (2; one from Kumaon and one from Garhwal region), NGOs (2; one from Kumaon and one from Garhwal region) representatives	To be nominated by CPD in rotation for a term of two years to voice their concerns in the meeting; PMU would pay travel and stay charges for attending meetings
17.	Member-Secretary	Chief Project Director	

	Position	Designated Person	Remarks
18.	Special Invitees	PMC, Scientist, academia etc. from renowned institution/ organization/ university/ agency	As and when required

Source: JICA Preparatory Survey Team

The Governing Body will meet at least once in a quarter, and would rigorously review the project progress vis-à-vis annual plans and would monitor the disbursement status. It will oversee the functioning of the PMU (society) regularly and prepare proposals for the HPC whenever necessary for the smooth implementation of the Project.

It will accord administrative and financial sanctions to all individual schemes, proposals or contracts for procurement of goods and services amounting to INR 2 million & above but not exceeding INR 50 million.

(2) Executive Body (EB)

EB is the executer and administrator of PMU, and will be responsible for the actual day-to-day implementation of the Project. It will consist of the following members:

Table 9.3.3 Composition of Executive Body

	Designated Person
1.	Chief Executive Officer/ Chief Project Director
2.	Project Director
3.	Finance Controller (advisory role only)
4.	Joint Project Director (Planning & Implementation)
5.	Joint Project Director (M&E/ Information Technology)
6.	Deputy Project Director
7.	Planning & Implementation Officer

Source: JICA Preparatory Survey Team

The Executive Body will meet at least once in a month formally or earlier if need be, and would keep day-to-day track of the project implementation along with other PMU staff. PMU would be responsible to guide, issue instructions, prepare guidelines, execute capacity development plan, establish and operate M&E system, undertake field visits and provide hand holding support in field in almost all respect for ensuring efficient implementation of the project.

It will accord administrative and financial sanctions of all individual schemes, proposals or procurement of goods & services not exceeding Rs.2 million.

(3) General Body

General Body is a decision making body on organizational policies and important financial/ human resources matters. The General Body of the Society will be consisting of the members of the Governing Body, Executive Body, Divisional Project Officers (DMUs) of all the divisions included in the Project, Zonal Chiefs and Conservators of Forests of all the identified Zone/ Circles where the project activities will be undertaken. The General Body will meet once a year during the State Annual Review Workshop of the project.

(4) Project Management Unit (PMU)

PMU would be headed by Chief Project Director (CPD) in the rank of CCF or above. S/he would also act as CEO of the society and would chair the Executive Body. S/he would also be Member-Secretary to the Governing Body of the society and for HPC as well. CPD would be supported by a team of officers that would include Project Director, Finance Controller, Joint PDs, Deputy Project Director (DPD) and other contractual staff hired from open market including MIS and GIS professionals, accountant and ministerial staff.

All the officers in PMU would be either on deputation from the UKFD for minimum of 3 years or as per existing deputation tenure specified in government rules or hired from open market either directly or through qualified and reputed placement/ government agency. For hiring administrative staff (steno/

computer operators, drivers, office helper/ utility person) PMU would adopt the existing government order. The structure of the PMU will be as follows:

Table 9.3.4 Composition of Project Management Unit (PMU)

Position	Key areas of Responsibility	Cadre level/ Experience	Positions	Remarks
Key Positions				
Chief Project Director	Overall technical, financial and administrative	APCCF/ CCF	1	From UKFD on deputation for minimum 3 years
Project Director	Overall project management and administration & finance	CCF/ Senior CF	1	From UKFD on deputation for minimum 3 years
Finance Controller	Advice CPD in areas – Financial Management, annual budget, fund disbursement, and would be responsible for preparing reimbursement claims, consolidation of SoEs & UCs, facilitating audits	Financial Services	1	On deputation State Finance Department; Full-time responsible as per society statutes
Joint Project Director (Planning & Implementation)	Management, Supervision, Control of planning & implementation relating to PMU, DMU & FMU; Facilitation of Convergence activities	CF	1	From UKFD on deputation for minimum 3 years
Deputy Project Director	Forest Technologies/ Forestry	DCF	1	From UKFD on deputation for minimum 3 years
Planning & Implementation Officer	Annual Planning and Budgets, Guidelines for implementation etc.	8-10 year experience	1	Open Market/ on deputation
Capacity Development & Livelihoods Officer	Capacity Development, Training, Livelihoods, Enterprise development and IGAs	8-10 year experience	1	Open Market/ Recruitment Agency
Joint Project Director (M&E/ Information Technology)	Management, Supervision of activities relating to Monitoring & Evaluation, MIS, GIS of the Project, publicity, production of reports and publications	CF	1	From UKFD on deputation for minimum 3 years
IT Officer	MIS and GIS	5-7 year experience	1	Open Market/ on deputation
Mass Communication and Media Officer	IEC material development, News Letters, publicity and publications	5-7 year experience	1	Open Market/ on deputation
Documentation Officer	Compilation, documentation and report production	5-7 year experience	1	Open Market/ Recruitment Agency
Total Key Positions			11	
Support Positions				
Accountant	Assist FC in project accounts, SOE, facilitate audits	3-5 year experience	2	Open Market/ Recruitment Agency
Personal Secretary for CPD and PD	File management, secretarial assistance	3-5 year experience	2	Open Market/ deputation from UKFD

Position	Key areas of Responsibility	Cadre level/ Experience	Positions	Remarks
Steno-cum-Computer Operators	File management, secretarial assistance	2-3 year experience	4	Open Market/ Recruitment Agency
Drivers	To drive the project vehicles	3-5 year experience	11	Open Market/ Recruitment Agency
Office Boy/ Peon	To support office functioning, cleaning	1-2 year experience	5	Open Market/ Recruitment Agency
Total Support Positions			24	

Source: JICA Preparatory Survey Team

The PMU will collate and consolidate the expenditure statements from divisional and field offices and prepare Statement of Expenditures (SOEs) for getting reimbursement of claims from JICA. To augment various skill sets PMU would further be supported by a team of experts constituting Project Management Consultants (PMC).

(5) Divisional Management Units (DMUs)

DMU will be created within the divisional forest office and would function as the dedicated extended wing of the PMU (society) for project implementation but not as subordinate office of the PMU. DMU would be headed by Divisional Project Officer (Ex-officio DFO) responsible to implement and supervise field operations. DMUs would also have other positions and support staff to manage and implement project activities. The UKFD staff deployed for the project would work exclusively on the project having no additional responsibility from UKFD under normal conditions.

DMUs will receive project funds from the PMU for the implementation of the project and disburse it to project implementers such as FMUs, and village level implementing units such as VPs, and BMCs. The DMUs will supervise the activities of those project implementers and assist the PMU in planning, fund management, work progress monitoring and documentation at the field level. DMUs will provide progress reports to PMU directly, and would also be reporting to Zonal/ Circle offices as per the current system and administrative structure. The structure of the DMU will be as follows:

Table 9.3.5 Composition of Divisional Management Unit (DMU)

Position	Area of Responsibility	Cadre level/ Experience	Positions	Remarks
Key Positions				
Divisional Project Officer (DPO)	Chapter 10 Overall – technical, financial and administrative	Deputy Conservator of Forest	1	DFO (Ex-Officio)
Assistant Divisional Project Officer (ADPO)	Technical, Administration & Procurement	Assistant Conservator of Forest	1	Full-time dedicated staff from UKFD
Programme Coordinator (PC)	Facilitating in implementation, monitoring, act as linkage between PMU and DMU, coordinating with district administration/ line departments for convergence, supervising NGOs works and guiding FMUs	8-10 year experience	1	Open Market/ Recruitment Agency
Accounts Officer (AO)	Management of project accounts, execution of fund disbursement, SOE and UCs, facilitate audits	4-6 year experience	1	Open Market/ Recruitment Agency
Total Key Positions			4	
Support Positions				
MIS Assistant	MIS operation, data-entry guidance,	2-3 year	1	Open Market/

Position	Area of Responsibility	Cadre level/ Experience	Positions	Remarks
	preparing and printing reports	experience		Recruitment Agency
Computer Operators	Data-entry, secretarial assistance	1-2 year experience	1	Open Market/ Recruitment Agency
Drivers	To drive the project vehicles	3-5 year experience	2	Open Market/ Recruitment Agency
Total Support Positions			4	

Source: JICA Preparatory Survey Team

Divisional Project Officer (DPO) would exercise its administrative and financial authority as per existing UKFD rules or as envisaged in the Operation Manual.

(6) Field Management Units (FMUs)

FMU will be created within the office of the Range Officer (RO) to take charge of project implementation at the range level and would extend all technical inputs and guidance at field level on a day-to-day basis. FMUs would be headed by FMU officer (Ex-officio Range Officer) and would be responsible for project implementation at VP/ field level. FMU would be supported by NGOs particularly for community mobilization and social processes. FMU operations would be further strengthened by support staff to manage project activities.

The FMU will receive project funds from the DMU to execute the works. The FMU will make the specific site development plans, facilitate VPs in micro-planning and estimations, undertake the works and document the physical and financial progress. The structure of the FMU will be as follows:

Table 9.3.6 Composition of Field Management Unit (FMU)

Position	Area of Responsibility	Cadre level/ Experience	Positions	Remarks
Key Positions				
Range Project Officer (RPO)	Overall – technical, financial and administrative	RO/ In-charge	1	Range Officer (Ex-Officio)
Assistant Range Project Officer (ARPO)	Technical, Administration & Procurement	Deputy RO/ Forester	1	Full-time dedicated staff from UKFD
Accountant	Assisting AO in management of accounts, SOE and UCs, training Animator on accounts maintenance, checking and helping VPs/ BMCs in accounts and book-keeping, facilitate audits	2-3 year experience	2	Open Market/ Recruitment Agency
Total Key Positions			4	
Support Positions				
Computer Operators	Data-entry, secretarial assistance	1-2 year experience	1	Open market
Total Support Positions			1	

Source: JICA Preparatory Survey Team

Range Project Officer (RPO) would exercise its administrative and financial authority as per existing UKFD rules or as envisaged in the Operation Manual.

9.3.3 Other Implementing Units

(1) Village Level Institutions

VPs and BMC would be involved in the project following well announced selection criteria and processes. The VPs and BMCs would receive funds from the DMU in project account as per the annual implementation plan and would be responsible for planning, implementation, monitoring and reporting at the lowest level.

The Management Committee of the VP which is headed by Chairperson (Sarpanch) and members as specified in VP Rules 2005, and would manage and implement the project activities following the Rules and project guidelines issued from time to time. Apart from the NGOs and FMU staff, VPs would be supported by Animators, who would be an educated person identified by community amongst themselves.

(2) Zonal and Circle offices

Zonal and Circle offices of the forest department concern with the project shall assist the implementation along with their respective regular and designated overseeing responsibilities, for providing vital link between the project and regular departmental activities, and for cross-checking project works vis-à-vis financial and physical progress reporting. PCCF (HOD) through office order would instruct these offices to supervise and support project activities in routine manner within their jurisdictions.

(3) District Advisory Committee (DAC)

DAC shall be created at the district level to provide technical and administrative support to the project, and facilitate convergence based on the annual convergence plan prepared by the DMU and placed in the DAC meetings. This committee will act as the hub for mapping various project interventions and investment and ensure inter-departmental convergence. Divisional Project Officer (DPO) would act as Member-Secretary and would be responsible to conduct meetings at least once every quarter. This committee would get created by a Government Order. The composition of the DAC would be:

Table 9.3.7 Composition of District Advisory Committee (DAC)

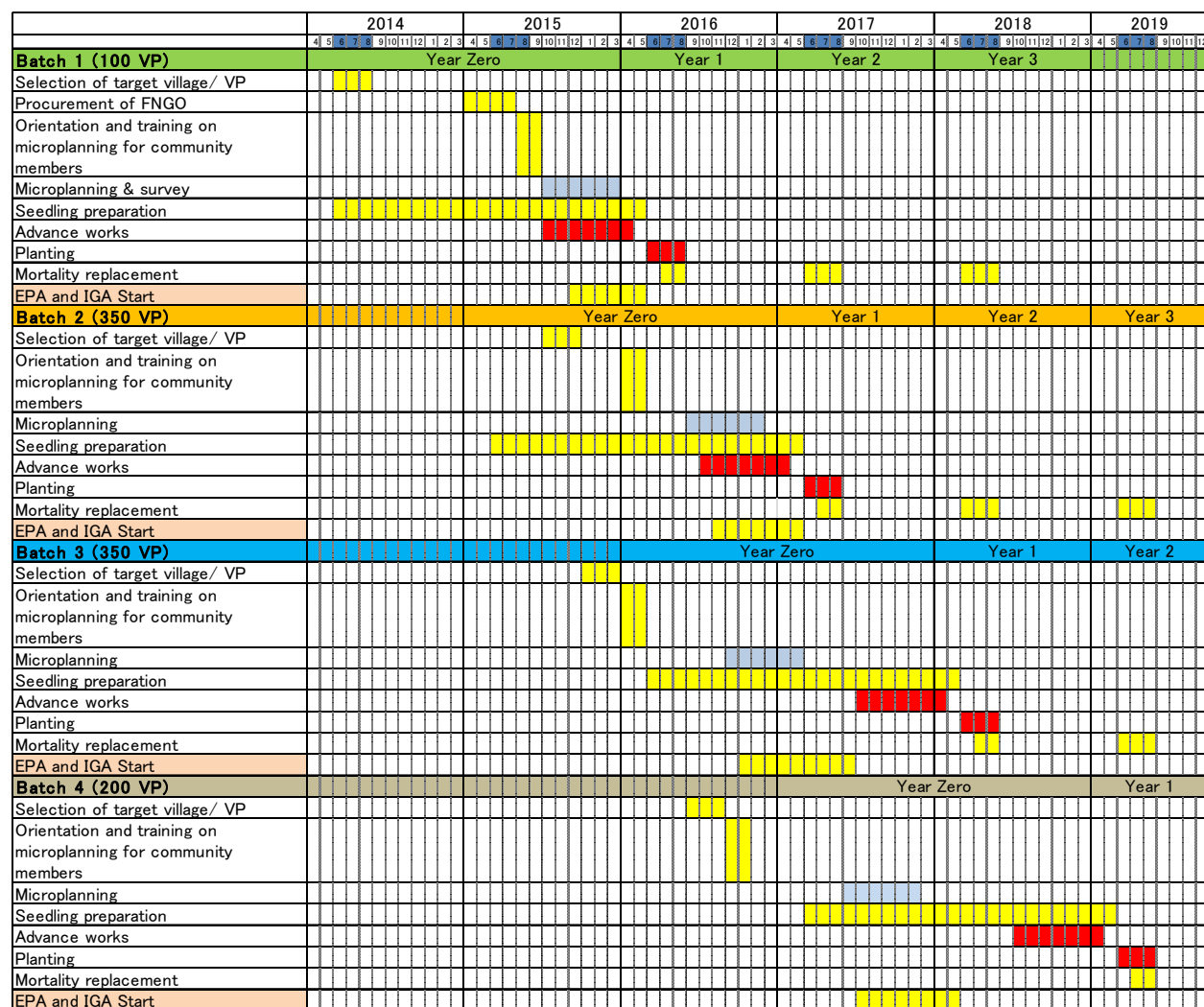
	Position	Designated Person	Remarks
1.	Chairperson	District Magistrate (DM)	
2.	Member	Chief Development Officer (CDO)	
3.	Member	Nodal Officer of UKFD / DFO	
4.	Member	District Agriculture Officer	
5.	Member	District Horticulture Officer	
6.	Member	Executive Officer District Rural Development Agency (DRDA)	
7.	Member	Lead Bank Manager	
8.	Member	Deputy District Manager NABARD	
9.	Member	NGO Head	To be nominated by rotation by CPD for a period of 2 years
10.	Member	VP (2) representatives	To be nominated by rotation by Divisional Project Officer (DPO) for a period of 2 years.
11.	Member-Secretary	Divisional Project Officer (DPO)	
12.	Special Invitees	Zilla Panchayat Adhyaksh/ other people representatives	as per availability

Source: JICA Preparatory Survey Team

Chapter 10 DETAILED IMPLEMENTATION SCHEDULE

It is anticipated that the project may begin in April 2014 after the signing of Loan Agreement between the two governments in March 2014, and the project is expected to complete after 8 years in 2022. The activities were planned taking into consideration the time required for preparation of planting materials, planting seasons, community mobilization and capacity building that is associated with the participatory approach.

The key project activities will be carried out in 4 batches at varying timing as indicated below:



Source: JICA Preparatory Survey Team

Figure 10.1.1 Schedule for Field-Level Key Project Works

The detailed overall Implementation Schedule suggested by the JICA Survey Team is found in **Attachment 10.1.1**.

The time-bound action plan for certain preparatory works after the JICA Preparatory Survey is summarized in the table below.

Table 10.1.1 Time Bound Action Plan

Area	Agreed Action	Responsible Person (Agency)	Target Date		Indicators
			Start	Complete	
Preparatory Works	Budgetary Sanction for FY 2013	UKFD		December 2013	Approval by State Govt., Budget notice
	Budgetary Sanction for FY 2014	UKFD		May 2014	Approval by State Govt., Budget notice
	Forming High Powered Committee	UKFD	November 2013	January 2014	Notification of establishment by the State Gov.
	Preparation and Submission of operation manual for PMU to JICA	UKFD/PMU	November 2013	February 2014	Draft Operation manual
	Final Approval by High Powered Committee of operation manual for PMU	UKFD/PMU	-	March 2014	Notification/Operation manual
	Establishment of Project Management Unit (PMU)	UKFD	November 2013	January 2014	Notification
	Enabling order regarding rearrangement of administration allocation of VP	UKFD	November 2013	November 2013	Order by UKFD
	First High Powered Committee and Governing Body meetings	UKFD/PMU	March 2014	March 2014	MM
	Posting staff for Division Management Units (DMUs)/Field Management Units (FMUs)	UKFD/PMU	January 2014	April 2014	Order by UKFD
	Recruitment of project staff	PMU	March 2014	July 2014	Employment agreement/contract
	Project management	PMU	April 2014	March 2022	Progress report
	Preparation of Composite Management Plan at Target Territorial Divisions	UKFD/PMU	November 2013	February 2014	CMP approved by CF
Consulting Services	Request for Concurrence of TOR, Short-list, Letter of Invitation to JICA India Office	PMU	January 2014	January 2014	Request for review & concurrence
	JICA's Concurrence to TOR, Short-list, and Letter of Invitation	JICA	February 2014	February 2014	JICA's concurrence letter
	Issuance of L/I to Short-listed Consultants	PMU	March 2014	March 2014	Letter of invitation
	Request for JICA's Concurrence to Evaluation Results of Proposals	PMU	June 2014	July 2014	Evaluation report
	JICA's Concurrence to Evaluation Results	JICA	September 2014	October 2014	JICA's concurrence to evaluation
	Contract with the Consultants	PMU	December 2014	December 2014	Contract Documents
	Consulting Services	PMU/Consultant	February 2015	August 2020	Notice to proceed

Source: JICA Preparatory Survey Team

Chapter 11 PROJECT COST

11.1 Summary of Cost Estimate

The total project cost is estimated to be INR 11,550 million or JPY 18,018 million, of which the base cost of the project implementation is estimated to be INR 8,272 million or JPY 12,904 million. The summary is given below, and the cost break ups is given in **Attachment 11.1.1**.

Table 11.1.1 Summary of Cost Estimate

	Particulars	Foreign Currency (million JPY)	Local Currency Portion (INR million)	Total (INR million)	Total (million JPY)
1	Component 1: Eco-Restoration	0	4,279	4,279	6,675
2	Component 2: Livelihood Improvement and Community Development	0	1,955	1,955	3,050
3	Component 3: Other Support Activities	0	638	638	995
4	Component 4: Erosion Control and Sediment Disaster Mitigation	0	1,400	1,400	2,184
5	Price Escalation	0	566	566	883
6	Physical Contingency	0	442	442	690
7	Consulting Services	334	169	383	598
8	Environmental Cost / Utility Relocation	0	0	0	0
9	Land Acquisition	0	0	0	0
10	Administration Cost	0	1,441	1,441	2,248
11	VAT	0	121	121	189
12	Service Tax	41	144	170	266
13	Import Tax	0	0	0	0
14	Interest during construction	210	0	135	210
15	Front End Fee	30	0	19	30
16	Total	616	11,156	11,549	18,018

Source: JICA Preparatory Survey Team

*Foreign currency portion is converted into INR by applying the conversion rate indicated in **Section 11.2**.

The cost estimate is prepared for foreign currency and local currency. The former is for the procurement of international consultants. The latter includes the procurement of rest of the goods and services to be procured locally and local tax and duties.

11.2 Conditions and Assumptions

In preparation of the cost estimate for the project, following assumptions were taken into account.

- a) The cost estimate for the project duration of 8 years was prepared on the basis of September 2013 constant prices or the relevant fixed rate for FY 2013-14 in INR.
- b) The quantity of each component, sub-component was estimated after analysis of the field conditions, operational modality, requirement for renovation or investment for facilities/ infrastructures that would be required to achieve the project objectives.
- c) The minimum wage for the labourers was estimated at INR 203 per day per person as it was the minimum wage for the State of Uttarakhand, although the Schedule of Rates of UKFD have not been revised (the official wage rate in UKFD's Schedule of Rates was still INR 100 per day at the time of JICA Preparatory Survey. After a series of discussions with UKFD and JICA, the Survey Team decided to adopt INR 203 per day wage as discussed in **Section 6.5.4 under 9) Wage Rate**.

- d) Schedule of rates from UKFD, Public Works Department and other government organisations were referred to in estimating unit costs. In other cases, the price quotations were obtained from reliable and relevant sources.
- e) The details of Unit Rates indicated in the Cost Breakdowns are carefully studied. The results are available with the JICA Survey Team as they are too voluminous to be included in this report.
- d) Budget was allocated in accordance with the priorities of requirement with reference to the project objectives.
- f) Exchange rate adopted was as: INR 1= JPY 1.56
- g) The price escalation for the local currency portion was estimated to be 3.13% per annum and for the foreign currency was 1.3%, as per the JICA indicators.
- h) A physical contingencies were 5.0% and 2.0% for project activities and Project Management Consultancy respectively. i) Value Added Tax (4%) for all the materials and consumables.
- j) Service Tax (12.36%) on the contractual works professional services and other services.
- k) Interest during the construction (0.3% for construction and 0.01% for consultant); and
- l) Front End Fee (0.2%).

11.3 Cost Component

The cost components comprise of: 1) direct cost in implementing the project activities, 2) administrative cost for the project staff, 3) price escalation, 4) price contingencies, consulting services, and taxes and duties. The outline of each cost component is given in this section.

11.3.1 Cost per Project Component (Direct Cost)

Direct cost includes the cost of implementing the project activities. 72% of the total project cost of INR 11,550 million or INR 8,272 million has been allocated as the direct cost. It has been allocated to 4 project components of 1) Eco Restoration (52%), 2) Livelihood Improvement and Community Development (24%), 3) Other Support Activities (8%) and 4) Erosion Control and Sediment Disaster Mitigation (17%).

Table 11.3.1 Cost Components

	Cost Component	Cost (INR million)	%
1	Base Cost	8,272	72%
2	Price Escalation	566	5%
3	Physical Contingency	442	4%
4	Consulting Services	383	3%
5	Non-Eligible Portion	1,732	15%
6	Interest during construction	135	1%
7	Front End Fee	19	0.2%
	Total	11,549	100%

Source: JICA Preparatory Survey Team

Table 11.3.2 Project Component-Wise Cost Ratio

	Project Component	Cost (INR million)	%
1	Component 1: Eco-Restoration	4,279	52%
2	Component 2: Livelihood Improvement and Community Development	1,955	24%
3	Component 3: Other Support Activities	638	8%
4	Component 4: Erosion Control and Sediment Disaster Mitigation	1,400	17%
	Total Base Cost	8,272	100%

Source: JICA Preparatory Survey Team

No land acquisition cost was estimated as no such requirement was foreseen.

11.3.2 Project Consultants

The project will employ a team of consultants for implementing the project activities. The cost estimate of the project consultants has been prepared in accordance with the scope of work and project implementation schedule. The estimated cost amounting INR 383.4 million includes the remuneration, per diem, price escalation and physical contingency but excludes the taxes and duties. The summary is given below.

Table 11.3.3 Cost for Consulting Service

Item	Foreign Currency (million JPY)	Local Currency (INR million)
International Consultants	310.4	0.0
National Consultants	0.0	76.3
Supporting Staff	0.0	9.9
Total (1)	310.4	86.2
Direct Cost	13.1	74.7
Total (2) (Total (1)+Direct Cost)	323.5	160.9
Price Contingency	4.1	5.0
Physical Contingency	6.6	3.3
Total (3) (Total (2)+Price & Physical Contingencies)	334.2	169.2
Grand Total in INR		383.4
Grand Total in JPY		598.2

Source: JICA Preparatory Survey Team

* Foreign currency portion is converted into INR by applying the conversion rate as in 11.2.

11.3.3 Administration Costs

The administration cost includes expenditures of the staff members of PMU/ DMUs/ FMUs who are on deputation from the government, some contractual project staff members, fuel and maintenance of vehicles, travel expenses and accommodations of project staff, office maintenance and running cost and costs for organising internal meetings and workshops, etc.

Together with other expenses which are non-eligible for JICA Yen Loan, it constitutes 15% of total project cost.

11.4 Annual Cost Schedule

Annual cost schedule was prepared in accordance with the project implementation schedule. The disbursement of the project fund will reaches maximum during the 4th Year (FY 2017-18). The summary is given in the table below.

Table 11.4.1 Annual Cost Schedule

Unit: INR millions

Cost Component	Year1	Year2	Year3	Year4	Year5	Year6	Year7	Year8
	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
Direct Cost	309	923	1,657	2,215	1,763	861	414	129
Price Escalation	0	0	51	139	169	112	68	26
Physical Contingency	15	46	85	118	97	49	24	8
Consulting services	6	75	95	91	53	44	19	0
Administration Cost	58	231	231	231	231	231	130	101
Taxes and Duties	33	50	55	63	70	72	54	48
Total	421	1,325	2,174	2,857	2,382	1,369	709	312
% against the total cost	4%	11%	19%	25%	21%	12%	6%	3%

Source: JICA Preparatory Survey Team

11.5 Financial Plan

According to the JICA funding policy, administration cost, taxes and duties will not be eligible to be financed by JICA but to be met by the State Government of Uttarakhand and Central Government of India. The non-eligible portion of the project is INR 1,887 million and the eligible portion is INR 9,663 million. Break ups of the financial plan is as below.

Table 11.5.1 Summary of Fund Requirement

Cost Item	Foreign Currency (Million JPY)		Local Currency (INR million)		Total (Million JPY)	
	JICA Portion	Non eligible portion	JICA Portion	Non eligible portion	JICA Portion	Non eligible portion
Component 1: Eco-Restoration	0	0	4,279	0	6,676	0
Component 2: Livelihood Improvement and Community Development	0	0	1,955	0	3,050	0
Component 3: Other Support Activities	0	0	638	0	995	0
Component 4: Erosion Control and Sediment Disaster Mitigation	0	0	1,400	0	2,184	0
Price Escalation	0	0	566	0	883	0
Physical Contingency	0	0	442	0	689	0
Consulting Services	334	0	169	0	598	0
Environmental Cost / Utility Relocation	0	0	0	0	0	0
Land Acquisition	0	0	0	0	0	0
Administration Cost	0	0	0	1,441	0	2,248
VAT	0	0	0	121	0	189
Service Tax	0	41	0	144	0	266
Import Tax	0	0	0	0	0	0
Interest during construction	0	210	0	0	0	210
Front End Fee	0	30	0	0	0	30
Total	334	282	9,449	1,706	15,075	2,943

Source: JICA Preparatory Survey Team

Chapter12 OPERATION AND MAINTENANCE

The operation and maintenance framework for the project is as given below.

Table 12.1 Operation and Maintenance Framework

Item	Operator	Maintenance Mechanism
Rehabilitated forests	Van Panchayat	<ul style="list-style-type: none"> ✓ As the mandate of UKFD is to manage all forests in the State regardless of its foreland types, including VP and Civil & Soyam Forest, UKFD will continue to support the proper management of forest rehabilitated under the project in VP or other forestlands. ✓ The loyalty from NTFP sales is expected as a part of increased state revenue. ✓ VP will generate revenue from the harvest of enhanced forest resources and supported IGA, a part of which will be re-invested in the proper management of rehabilitated forests. ✓ As the current rules empower VP to collect certain fees, VP may collect fees from the villagers for the collection of forest produce, such as fuelwood, fodder, minor timber, etc.
NTFP plantation	UKFD	<ul style="list-style-type: none"> ✓ As the NTFP plantation will be within the Reserved Forests under the direct management of the UKFD, UKFD will manage it. ✓ The state revenue is expected to increase from the NTFP harvesting.
Central nursery	UKFD	<ul style="list-style-type: none"> ✓ Division offices of UKFD will maintain the nursery.
Wildlife response team and facility/ equipment	UKFD	<ul style="list-style-type: none"> ✓ Circle offices of UKFD will maintain the teams and equipment to be provided to the team.
VP office building cum disaster relief centre and furniture	Van Panchayat	<ul style="list-style-type: none"> ✓ Using VP's revenue from various sources illustrated above, VP will ensure the maintenance of building. ✓ For a major renovations, UKFD will extend its support using its own budget or through convergence.
Other community infrastructure	Gram Panchayat and other concerned agencies	<ul style="list-style-type: none"> ✓ Other infrastructure to be constructed under the project through convergence, such as drinking water facilities, community centres, schools, access roads, etc. will be managed by the village government (Gram Panchayat) and other concerned agencies, such as the Drinking Water Dept., Education Dept., Rural Dev. Dept., etc.
NTFP Centre of Excellence (NCE)	NCE (autonomous society)	<ul style="list-style-type: none"> ✓ NCE building will be maintained by NCE itself. ✓ During and after the project, NCE will generate revenue from: <ul style="list-style-type: none"> ➤ Revenues earned from the dividend of corpus/ equity to partner SHG federations/ coop/ producers' companies ➤ Different Government Programmes and Schemes, ➤ Fees earned through business development services i.e. providing training and extension services, business planning, building linkages, market support, etc. ➤ Rental fees collected from training facilities ➤ Consulting fee for various research projects and development programs ➤ Accessing funds from the private sector for setting up enterprises and earning revenue from the enterprises.
Production centre	IGA clusters/ SHG federations/ cooperatives/ producers' companies	<ul style="list-style-type: none"> ✓ The facilities and equipment will be maintained by the IGA clusters/ SHG federations/ cooperatives/ producers' companies using the revenue from their enterprise activities. ✓ The business operations of the organizations/ centres will be supported by NCE

Item	Operator	Maintenance Mechanism
IGA revolving fund	NCE and VP	<ul style="list-style-type: none"> ✓ IGA revolving fund will be managed by VP. The management cost of VP will be covered by the revenue from the interests. ✓ NCE's fund will be invested to various enterprise activities of IGA clusters/ SHG federations/ cooperatives/ producers' companies and maintained as corpus.
Ecotourism destination sites	Van Panchayat	<ul style="list-style-type: none"> ✓ The facilities and equipment for ecotourism will be maintained by VP ✓ VP is expected to generate revenue from the tourism operations, a part of which will be kept for ongoing and future maintenance of facilities and equipment provided by the project. ✓ Additional support may be provided by UKFD for maintenance beyond the project
Office building and furniture	UKFD	<ul style="list-style-type: none"> ✓ DMU and FMU will be created within the existing divisions and ranges, and the office of DMU and FMU will be constructed as extension of divisions and ranges. UKFD will maintain the buildings. ✓ PMU building will be constructed separate from the UKFD Headquarters. After the project, PMU building will be used by UKFD for various purposes.
Vehicle and equipment	UKFD	<ul style="list-style-type: none"> ✓ The vehicles and equipment will be used and maintained by the UKFD
GIS laboratory	UKFD	<ul style="list-style-type: none"> ✓ The project will strengthen the existing GIS laboratory of UKFD by creating its extension unit. The unit will continue to be managed by UKFD after the project.
MIS	UKFD	<ul style="list-style-type: none"> ✓ Management Information System to be created under the project may be introduced to UKFD and expanded to cover other non-project areas.
UKFD Research Wing	UKFD	<ul style="list-style-type: none"> ✓ The facilities and equipment to be provided by the project to the research wing of UKFD will be maintained by the UKFD.
Sediment disaster mitigation measures	UKFD	<ul style="list-style-type: none"> ✓ The structures to be created under the project for sediment disaster mitigation will be maintained by UKFD.
Emergency shelter	District government	<ul style="list-style-type: none"> ✓ The emergency shelter will be handed over to the district office in the area and will be maintained by the district office.
Emergency kit	VP/ Gram Panchayat	<ul style="list-style-type: none"> ✓ VP will be responsible for the maintenance of emergency kit at the VP building. ✓ GP will be responsible for the maintenance of emergency kit at the emergency shelter.

Source: JICA Preparatory Survey Team

Chapter 13 PROJECT EVALUATION

13.1 Expected Economic Benefits

UFRMP comprises of four major components: 1) Eco-restoration, 2) Livelihood improvement, 3) Other supporting activities that would create an enabling condition for the project implementation and 4) Erosion control and sediment disaster mitigation. The project will bring about the benefits, which are qualitative, including capacity building of women, improved sense of well being of the community or enhanced autonomy of VPs and SHGs.

It also brings the direct and tangible benefits to the project beneficiaries. Such tangible benefits are expected to be generated out of activities were identified to deliver economic benefits to the beneficiaries and their economic benefits were estimated to assess the economic viability of the project investment by way of Economic Internal Rate of Return and Net Present Value (NPV).

Table 13.1.1 Anticipated Economic Benefits of UKFRMP

Components and Activities	Benefits
Component 1. Eco Restoration	Increased supply of fodder and fuel wood Increased production of NTFPs CO ₂ sequestration by afforestation
Component 2. Livelihood Improvement and Community Development	Income generated through enterprise development (NTFP and non-NTFP)
Component 3. Other Support Activities	(No benefits)
Component 4. Erosion Control and Sediment Disaster Mitigation	Reduced damages on agriculture crops, houses, human lives and infrastructures

Source: JICA Preparatory Survey Team

13.2 Basic Assumption for Cost-Benefit Analysis

The following assumptions were taken into consideration while analysing the cost-benefit ratio.

- 1) The economic life of the project is assumed to be 40 years.
- 2) The project costs in the project period are estimated based on September 2013 constant prices in Indian Rupees.
- 3) The economic cost includes cost of eco restoration activities, livelihood and community development, and operation and maintenance.
- 4) The economic cost of the project is the cost of project activities that bring the profit directly to the community and target society as a whole.
- 5) A standard conversion rate of 0.9 was applied to arrive at the economic cost.
- 6) The prices of NTFPs are estimated taken into consideration of whole sale price and the transaction costs as there are many middle men involved in the trading process.
- 7) The average prices of farm produces that would be produced by SHGs were estimated on the basis of whole sale price and used for the calculation of EIRR.
- 8) No profit from timber was considered as the green felling is not permitted above 1,000 m in Uttarakhand.
- 9) No profits from the eco tourism and building constructions were included.

Table 13.2.1 Summary of the Conditions considered for Calculation of EIRR

Factors	Condition
Exchange rate	Rs. 1.00 = 1.56 Yen
Price Escalation	Foreign Currency: 1.3% Local Currency: 3.1%
Physical Contingency	Construction: 5.0%
Taxes and other kinds of transfer payments	Not considered

Source: JICA Preparatory Survey Team

13.3 Calculation of EIRR

Economic Internal Rate of Return (EIRR) and Net Present Value (NPV) were calculated taking into consideration of the conditions stated in the above selection. EIRR was shown as **10.1%**, and the details of calculation are shown in **Attachment 13.3.1**.

Table 13.3.1 Results of Economic Analysis

Economic Index	Result
NPV (Rs.)	542,848,464
EIRR	10.1%

Source: JICA Preparatory Survey Team

Table 13.3.2 Summary of Expected Benefit from Project Activities

Unit: Rs. millions

Project component	Benefit	Cost	Value
Component 1: Eco Restoration	19,885	3,986	18,943
NTFP Plantation	3,043	1,955	
Component 2: Livelihood			
NTFP based	967	Not considered	2,326
Non NTFP based	3,314	Not considered	
Component 3: Other Support Activities	0	Not considered	0
Component 4: Erosion Control & Sediment Disaster Mitigation	4,035	Not considered	4,035
Total	31,245	5,941	25,304

Source: JICA Preparatory Survey Team

13.4 Sensitivity Analysis

Sensitivity analysis was carried out to see the economic viability of the project under the different economic conditions. The results of the calculation in the case of i) 20% increase of cost, ii) 10% decrease of benefit and 20% increase of cost and iii) 20% decrease of the benefit. The results of analysis are given below.

Table 13.4.1 Sensitivity Analysis by EIRR

Change of cost	Change of benefit		
	0%	-10%	-20%
0% (Base cost)	10.1%	9.1%	7.9%
+10%	9.2%	8.1%	7.0%
+20%	8.3%	7.3%	6.3%

Source: JICA Preparatory Survey Team

13.5 Employment Opportunities

For the cost estimation during the JICA Preparatory Survey, each cost was categorized into three: 1) Labor, 2) Material and 3) Professional. The summary of direct cost category-wise is summarized in the table below.

Table 13.5.1 Base Cost of Project (category-wise)

Unit: Rs.

Labor	Material	Professional	Total
4,245,845,143	3,028,117,163	998,279,805	8,272,242,111
51.3%	36.6%	12.1%	100.0%

Source: JICA Preparatory Survey Team

The wage rate that was adopted for the cost calculation is Rs. 203 per day. 20,915,493 person-days (or 697,183 person-months) of employment will be generated by the project.

13.6 Estimation of GHG Removal by Carbon Sink

Carbon dioxide (CO₂) sequestration was estimated for each Eco-Restoration (ER) Model. Different value of carbon increment was allotted for CO₂ sequestration estimation as each Eco-Restoration (ER) Model is comprised of different activities and varying scales of plantation.

In ER Model I, commonly-used carbon increment indicated by other documents and reports was not applicable as this model does not include planting trees. Therefore, we assumed the following to calculate carbon sequestration in this model. Biomass of degraded forest in Uttarakhand is reported about 17.6 ton/ha. This amount of biomass increases to the same level of average biomass in India's forest (35.5 ton/ha) by the implementation of the project. On the basis of this assumption, annual carbon increment was calculated. In contrast, ER Model III will plant 1,000 trees per hectare. In this model, the average annual carbon increment in Uttarakhand was used for calculating CO₂ sequestration. ER Model II will only plant half the number of trees per hectare in comparison to ERM III (500 trees/ha). Hence, carbon increment was assumed to be half the value of ER Model III. Using these carbon increment values, CO₂ sequestration in this project was calculated. The result of calculation shows a cumulative total CO₂ removal of approximately 3,605,121 tonnes in 40 years.

The volume of CO₂ sequestration was also converted as CER (Certified Emissions Reductions) for economic analysis. Annual CER price in 2011 by World Bank was used for estimating benefit of carbon sequestration and net value each year is shown in **Attachment 13.6.1**.

Japan International Cooperation Agency (JICA)

**Forest Department
The State of Uttarakhand, India**

**The Preparatory Survey
for
Uttarakhand Forest Resource
Management Project
in India**

**Final Report
Volume I I: Disaster Mitigation**

February 2014

NIPPON KOEI CO., LTD.

Final Report for the Preparatory Survey
for Uttarakhand Forest Resource Management Project
in India
Volume II : Disaster Mitigation
Table of Contents

	Page
List of Acronyms.....	IV
Chapter 1 NATURAL DISASTERS IN UTTARAKHAND	1-1
1.1 Overview	1-1
1.2 Disaster in June 2013.....	1-3
1.2.1 Outline.....	1-3
1.2.2 Disaster Scale.....	1-4
1.2.3 Photos of Disasters.....	1-11
Chapter 2 SITE INVESTIGATION	2-1
2.1. First Site Inspection	2-1
2.2. Second Site Inspection	2-3
2.3. Third Site Inspection	2-7
Chapter 3 PRESENT INSTITUTIONAL FRAMEWORK FOR DISASTER MANAGEMENT	3-1
3.1 Disaster Management Framework of India	3-1
3.1.1 Disaster Management Act of India 2005	3-1
3.1.2 National Disaster Management Plan	3-2
3.1.3 Relevant Central Government Bodies.....	3-6
3.1.4 Key Policies, Laws and Regulations	3-7
3.2 Concrete Efforts by the Central Government	3-10
3.2.1 Earthquake	3-10
3.2.2 Forecasting and Early Warning Systems	3-10
3.2.3 Strengthening of the Emergency Operations Centres	3-11
3.3 Disaster Management Framework in Uttarakhand.....	3-11
3.3.1 Organization.....	3-11
3.3.2 State Disaster Management Plan.....	3-16
3.3.3 Concrete Effort by the State Government.....	3-16
Chapter 4 RESPONSE TO RECENT DISASTER.....	4-1
4.1 Rescue and Emergency Relief	4-1
4.1.1 Damage Assessment by Donors.....	4-1
4.2 Assistance from the World Bank.....	4-1
4.3 Assistance from Asian Development Bank	4-3
4.4 Assistance from GoI	4-3
4.5 Other Supports.....	4-3

Chapter 5	ISSUE ON DISASTER RISK MANAGEMENT.....	5-1
5.1	Current Issue regarding Risk Management Plan	5-1
5.2	Implementation of Plans and Performance.....	5-1
5.3	Technical Issue	5-3
5.3.1	Technical Manual.....	5-3
5.3.2	Erosion Control and Sediment Disaster Mitigation Techniques of UKFD.....	5-4
5.3.3	Exceeding Focus on Dry Masonries and Gabion Structures.....	5-5
5.3.4	Unattended Problems of Road	5-6
5.3.5	Unattended Problems of River Disasters	5-9
Chapter 6	NEEDS FOR EXTERNAL SUPPORT	6-1
6.1	Potential Areas for Support and Gap between Requirements and Responses.....	6-1
6.2	Slope Stabilization, River Training and Capacity Building	6-3
6.3	Road Development of and Other Infrastructure for Access	6-4
6.4	Support for Livelihood Development.....	6-5

List of Tables

Table 1.1.1	Major Earthquakes of Uttarakhand	1-2
Table 1.2.1	Condition of Damage	1-4
Table 1.2.2	Damages Incurred to the Forest Infrastructure	1-4
Table 1.2.3	Summary of Damage to BRO, National and State Road Infrastructure	1-5
Table 1.2.4	Summary of District – Wise Damage to Other Road Infrastructure	1-5
Table 1.2.5	Damage to Irrigation Infrastructure	1-6
Table 1.2.6	Preliminary Estimate of Damage to Irrigation Infrastructure	1-6
Table 1.2.7	Loss of Crops and Agriculture Land	1-7
Table 1.2.8	Estimated Loss to Agriculture Sector	1-8
Table 1.2.9	Horticultural Crop Area Damaged (All Districts)	1-8
Table 1.2.10	Horticultural Crop Loss in All Districts	1-9
Table 1.2.11	Impact on Horticulture in the Five Districts	1-9
Table 1.2.12	Domestic Animal Mortality and Estimated Damage	1-10
Table 1.2.13	Number of Horses, Mules, Donkeys Dead	1-10
Table 1.2.14	Loss in Tourism Sector	1-11
Table 3.1.1	National Disaster Management Planning Guideline	3-3
Table 3.1.2	Management Process of Landslides and Snow Avalanches.....	3-5
Table 3.3.1	State-Wide Road Category and Length.....	3-12
Table 3.3.2	Existing Plan and Manual for Disaster Management.....	3-16
Table 5.1.1	Key Observation of the Comptroller and Auditor General of India on Disaster Preparedness.....	5-1
Table 5.1.2	Key Observations the Comptroller and Auditor General of India on Performance Reviews of Uttarakhand Department of Disaster Management.....	5-2
Table 6.1.1	Gap between Requirement and Planned Support for Recovering from Disaster	6-1

List of Figures

Figure 1.1.1	State of Uttarakhand.....	1-1
Figure 1.1.2	Earthquake Zonation in Uttarakhand	1-3
Figure 1.2.1	Shelter Damage Categories	1-7
Figure 1.2.2	Satellite Imageries showing the difference before and after the disaster	1-11
Figure 1.2.3	Photographs of Kedarnath	1-12
Figure 1.2.4	Photographs showing the Damages caused by the Disaster in June 2013	1-12
Figure 1.2.5	Analysis conducted by USAC and NRSC on Post Disaster Landscape based on the satellite imagery	1-13
Figure 2.1.1	Site Inspection Map	2-1

Figure.2.1.2	Slope Failure Distributed in the Sightseeing Area.....	2-1
Figure 2.1.3	Slope Failure Occurred in the Concave Landform.....	2-2
Figure 2.1.4	Road Shoulder Failure Occurred along the River (Rajbala Road in Dhalin, Kalsi Forest Division).....	2-3
Figure 2.2.1	Site Inspection Map	2-3
Figure 2.2.2	Condition of Site A	2-4
Figure 2.2.3	Condition of Site C (1).....	2-4
Figure 2.2.4	Condition of Site C (2)	2-5
Figure 2.2.5	Condition of Site H (1)	2-5
Figure 2.2.6	Condition of Site H (2)	2-6
Figure 2.2.7	Condition of Site J in Rishikesh.....	2-6
Figure 2.3.1	Site Inspection Map	2-7
Figure 2.3.2	Flood Inundation Mark (Anthrag Dang).....	2-9
Figure 2.3.3	Landslide by River Erosion.....	2-8
Figure 2.3.4	Area which River Training is Required	2-:
Figure 2.3.5	Damage in the Lambagarh Village	2-10
Figure 3.1.1	National Disaster Management Structure	3-2
Figure 3.2.1	Earthquake Monitoring and Seismic Distribution.....	3-10
Figure 3.3.1	Institutional Arrangement at District Level	3-12
Figure 3.3.2	Landslide Map and Landslide Hazard Map	3-18
Figure 5.3.1	Table of Contents of the Technical Manual on Soil and Water Conservation	5-4
Figure 5.3.2	A Sample of Disaster Prevention Plan Prepared by the Forest Department	5-5
Figure 5.3.3	Countermeasure for Gully.....	5-6
Figure 5.3.4	Site Photographs of Landslide and Slope Failure induced by Various Causes.....	5-8
Figure 5.3.5	Site Photographs showing Characteristics of Slope Failure Countermeasure	5-8
Figure 5.3.6	Sample Gabion Structure in Japan	5-8
Figure 5.3.7	Slope Failure caused by Inadequate River Training	5-9

List of Attachment

- Attachment 4.2.1 World Bank and ABD Funding Pattern: Disaster Relief Emergency Loan 2013-14
- Attachment 6.3.1 Project Proposed for Road Improvement under Special Central Assistance (SCA)

List of Acronyms

ADB	Asian Development Bank
AHEC	Alternate Hydro Energy Centre
ALTM	Airborne Laser Terrain Mapper
BRO	Border Road Organisation
CAG	Comptroller and Auditor General
CAT	Catchment Area Treatment
CD	Community Development
CRF	Calamity Relief Fund
CRPF	Central Reserve Police Force
CSS	Centrally Sponsored Schemes
CWC	Central Water Commission
DDMA	District Disaster Management Authority
DDMP	District Disaster Management Plan
DEOC	District Emergency Operating Centre
DM	Disaster Management
DMMC	Disaster Mitigation and Management Centre
DPR	Detailed Project Report
DRR	Disaster Risk Reduction
FCI	Food Corporation of India
FPAP	Flood Prone Area Project
GDP	Gross Domestic Product
GFCC	Ganga Flood Control Commission
GIS	Geographic Information System
GOI	Government of India
GOUK	Government of Uttarakhand
GRF	General Reserve Engineer Force
GSI	Geological Survey of India
ICT	Information and Communications Technology
IIT	Indian Institute of Technology
IMD	Indian Meteorological Department
INR	Indian National Rupee
ISRO	Indian Space Research Organisation
IT	Information Technology
ITBP	Indo-Tibetan Border Police
JICA	Japan International Cooperation Agency
MDR	Major District Roads
MHA	Ministry of Home Affairs
MHP	Mini Hydro Projects
MW	Megawatt
NCC	National Cadet Core
NCT	National Capital Territory
NCCF	National Calamity Contingency Fund
NDMA	National Disaster Management Authority
NDRF	National Disaster Response Force
NEC	National Environment Commission
NGO	Non Governmental Organisation
NIDM	National Institute of Disaster Management
NRSC	National Remote Sensing Centre

NSS	National Service Scheme
NWP	National Water Policy
NYKS	Nehru Yuva Kendra Sangathan
ODR	Other District Roads
PD	Project Document
PMGSY	Pradhan Mantri Gram Sadak Yojana
PRI	Panchayat Raj Institutions
PWD	Public Works Department
RBM	River Basin Management
RDD	Rural Development Department
RM	River Management
RVP	River Valley Project
SAC	Space Application Centre
SDMA	State Disaster Management Authority
SDRF	State Disaster Response Force
SEC	State Environment Commission
SEOC	State Emergency Operation Centre
SMS	Short Message Service
SNRMS	State Natural Resources Management System
UEC	User Energy Committee
UEPPCB	Uttarakhand Environment Protection and Pollution Control Board
UJVNL	Uttarakhand Jal Vidyut Nigam Limited
UKFD/FD	Uttarakhand Forest Department
UN	United Nations
UNDMT	United Nations Disaster Management Team
UREDA	Uttarakhand Renewable Energy Development Agency
USAC	Uttarakhand Space Application Centre
USD	United States Dollar
WB	World Bank
WMD	Watershed Management Directorate
WMO	World Meteorological Organisation

Measurement Units

Extent	Weight
1 km ² = 100 ha	1 Quintal / qtl. = 100 kg
1 acres = 0.40468ha	
Number	Currency
Lakh = 100,000	Rs. = Indian Rupees (INR)
Crore = 10,000,000	JPY = Japanese Yen
	USD = \$ =United State Dollars

Exchange Rate

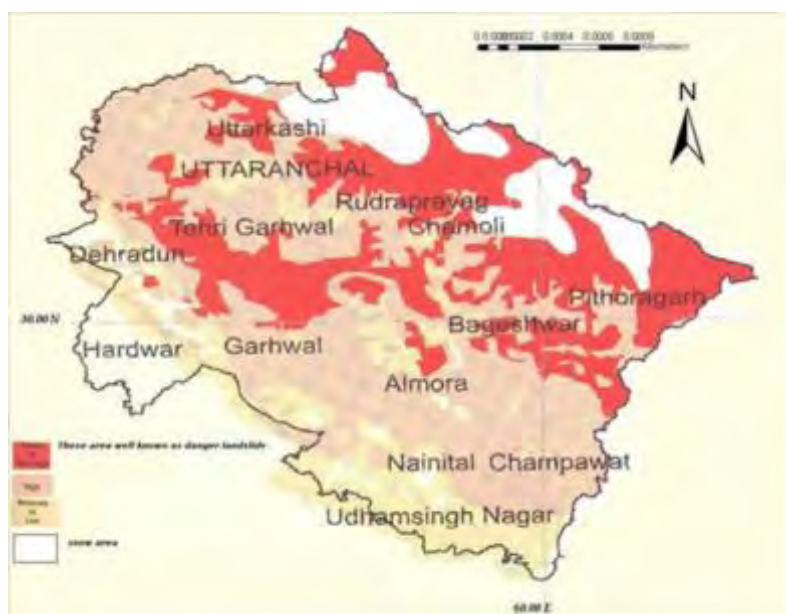
Rs.1.0 = JPY 1.56 USD 1.0 = Rs.63.8 USD 1.0 = JPY 99.2
(As of October 2013)

Chapter 1 NATURAL DISASTERS IN UTTARAKHAND

1.1 Overview

Uttarakhand borders Tibet to the north, Nepal to the east, and the states of Himachal Pradesh and Uttar Pradesh in the west and south respectively. The region is traditionally referred to as Uttarakhand in Hindu scriptures and old literature, a term which derives from the Sanskrit for Northern Country or Section. Uttarakhand by virtue of its geographical setting is vulnerable to minor ecological changes. Hence any activity disapproved by mountain ecosystem triggers a disaster.

Disasters are synonymous to damage of property, life and psyche of the people. If disasters cannot be averted, then reduction of losses of any type, caused by disaster becomes a focal point of the policy. Uttarakhand is a disaster prone state. Landslides, forest fires, cloudbursts and flash-floods are seasonal in nature, and they strike at a certain period of the year with high frequency. The landslide zoning map has been prepared by the State Government as shown below:



Source: <http://dmmc.uk.gov.in/pages/display/96-landslide-zone>)

Figure 1.1.1 State of Uttarakhand

In recent years before the major disaster in June 2013, there have been major incidents of damage and losses relating to sediment disaster as listed below:

- July 1970 – Alaknanda river: Entire river basin, from Hanumanchatti near the pilgrimage town of Badrinath to Haridwar swept away.
- 17 August, 1998 – Pithoragarh District: 250 people killed in Malpa village including 60 Kailash Mansarovar pilgrims.
- 6 July, 2004 – Alaknanda river: 17 people killed and 28 injured.
- 7 August, 2009 – Pithoragarh District: 38 people killed near Munsiyari.
- 15 September, 2010 – Almora District: Washed away two villages.
- 3 August, 2012 – Uttarkashi District - 39 people dead.
- 14 September, 2012 – Rudrapur District - 4 people dead.

Source: Department of Irrigation, Uttarakhand

The entire State is part of the larger Ganga Basin. The main drainage system of Uttarakhand has been grouped into following six sub basins:

- Yamuna Basin: The Yamuna river originates from the base of Bandarpunch peak. It has carved a deep V- shaped gorge. The Yamuna cuts across the Nag Tibba range and Mussoorie range near a place called Yamuna Bridge. The rivers Tons, Pabar and Aglar are its important tributaries. It passes through the Doon valley on its Western boundary.
- Bhagirathi Basin: This is one of the two rivers, which join to form the river Ganga. It originates from the snout of the Gangotri glacier at Gaumukh, which is at the base of Chaukhamba peak. The Bhagirathi River has cut a deep gorge across the granitic rocks of the higher Himalayas of Garhwal. Its main tributaries are the river Janhavi and the Bhilangana.
- Alaknanda Basin: This river joins the river Bhagirathi at Devprayag to form the river Ganga. It originates from the eastern slopes of Chaukhamba – from the Bhagirathi kharak and Satopanth glaciers. The river flows along the Badrinath temple. Its main tributaries are the Khiraonganga, Pindar Dhauliganga, Birahi, Nandakini, Mandakini etc. It has formed a broad valley at Srinagar (Garhwal).
- Mandakini Basin: It comes out from the Mandakini glacier near Kedarnath. It cuts through a gorge of glacial debris. The river has formed road terraces at Augustmuni and Tilwara. At Tilwara the river Lastar Gad joins it. The river Mandakini joins the river Alaknanda at Rudraprayag.
- Pindar Basin: The River Pindar originates from the Pindari Glacier, which is located between Nanda Devi and Nanda kot peaks. Sundardhunga River joins the Pindar near Dhakuri. The Pindar joins the river Alaknanda near Karanprayag.
- Kali Basin: The river Kali forms the boundary between Kumaon and Nepal. The towns of Champawat and Pithoragarh are situated on the back of the Kali River. Its important tributaries are Darma and Saryu rivers.

Earthquake is another devastating disaster in the mountains and is unpredictable. Uttarakhand has experienced two major earthquakes (magnitude >6) in Uttarkashi (1991) and Chamoli (1999) and a series of landslides/cloud bursts such as Malpa (1998), Okhimath (1998), Fata (2001), Gona (2001), Khet Gaon (2002), Budhakedar (2002), Bhatwari (2002), Uttarkashi (2003), Amparav (2004), Lambagar (2004), Govindghat (2005), Agastyamuni (2005) Ramolsari (2005) and many more.

Table 1.1.1 Major Earthquakes of Uttarakhand

Date	Intensity	Place
01.09.1803	9.0	Badrinath
1809	9.0	Garhwal
26.03.1816	7.0	Gangotri
25.06.1869	6.0	Nainital
28.10.1916	7.5	Dharchula
28.10.1937	8.0	Dehradun
27.07.1966	6.3	Kapkot, Dharchula
28.08.1968	7.0	Dharchula
29.07.1980	6.5	Dharchula
20.10.1991	6.6	Uttarkashi
29.05.1999	6.8	Chamoli

Source: Disaster Management in the Hills; Dr. Satendra IFS 2003, P91



Source : DMMC <http://dmmc.uk.gov.in/pages/display/95-earthquake-zone>

Seismic Zone; II (Low intensity zone), III (Moderate intensity zone), IV (Severe intensity zone), V (Very severe intensity zone)

Figure 1.1.2 Earthquake Zonation in Uttarakhand

1.2 Disaster in June 2013

1.2.1 Outline

Uttarakhand, the hill State in Northern India, was severely hit by flash floods and landslides on 16th and 17 June, 2013, resulting in huge loss to lives and properties. The heavy rainfall, according to Indian Meteorological Department (IMD), was 4-9 times of normal for the week of 13 – 19 June, 2013. The rainfall ranged between 50 mm to 500 mm till 16th June. The possible causes of the unprecedented phenomena were: 1) Collision of Western disturbances with monsoon easterlies, 2) Heavy precipitation on three continuous days above tree line resulting into runoff of debris, moraine and boulders from 4,000 m to 2,000 m in 6 km distance.

There have been cloudbursts in several river basins including the Bhagirathi, Alaknanda, Yamuna, Asiganga and Mandakini, which were devastated by flash floods and landslides. Increasing levels of water in two main rivers of the State, namely Alaknanda and Bhagirathi, have also resulted in the collapse of bridges, and damaging and washing away of property which has not been estimated yet. Several villages and settlements suffered heavy damages, including Kedarnath Shrine area, Harsil, Uttarkashi, Gaurikund, Rambara, Guptkashi, Sonprayag, Srinagar, etc.

More incidents of cloudburst were reported in the districts of Pauri Garhwal on 24 June 2013 due to continuous rainfall in Uttarakhand since 14th June 2013 resulting in increase of water level and flow of two main rivers of Alaknanda and Bhagirathi. Incidents of cloudburst, flash flood and landslides at various locations have also triggered the impact resulting in loss of life, damages to property and road block in the state. Rescue operations by Army personnel continued while many people remained stranded. These flash floods brought misery in the life of the people in Uttarakhand, especially in the districts of Rudrapur, Uttarkashi, Chamoli, Pauri and Tehri, though parts of Himachal Pradesh, Haryana, Delhi and Uttar Pradesh in India, some regions of Western Nepal, Western Tibet also experienced heavy rainfall. Over 95% of the casualties occurred in five districts of Uttarakhand.

1.2.2 Disaster Scale

The extent of damage reported by the State Government as on 20.07.2013 is as shown below.

Table 1.2.1 Condition of Damage

No. of Districts affected	13
No. of villages affected	Over 4,000
No. of villages badly damaged	1,603
No. of villages to be relocated	293
No. of human lives lost	580*
No. of people missing	5,474
No. of bodies recovered	249
No. of persons injured	4,473
No. of persons rescued to safer places	108,653
Pilgrims stranded at various places	All the pilgrims have been evacuated
Livestock lost	9,470
No. of houses damaged	4,726
Cattle sheds damaged	649

Source: Government of Uttarakhand (2013)

*Including 20 victims of helicopter crash.

Above figures are provisional and have been gathered from various sources. There has been no official update on the figures after 20 July 2013. These are likely to change as further information is received from various sources.

(1) Forestry

Some forest areas, including tree cover, grasslands and high altitude pastures have been washed away and there are intermittent losses to forest patches in the worst-hit districts of Uttarakhand. Almost 1,000 km length of forest road (inside forests) and about 2,500 km of bridle paths are reported to have been damaged and require urgent reconstruction.

Several residential and office buildings/structures (about 200), log bridges, other temporary bridges and culverts (totaling about 76), soil and moisture conservation structures like check dams, retaining walls, gully plugs, river training works, etc. and nurseries (63 ha) and plantations (247 ha), have been damaged and need to be reconstructed and/or repaired urgently.

Table 1.2.2 Damages Incurred to the Forest Infrastructure

	District	Residential Bldgs (No.)	Non-Residential Bldgs (No.)	Forest Motor Roads (km.)	Bridle paths (km.)	Bridge/Culverts (No.)	Nurseries (ha.)	Plantations (ha.)	Other Works (Soil & Water Conservation, etc.) (No.)
1	Bageshwar				2			7	
2	Chamoli	24	12	0.00	434.4	5	17	4	209
3	Pithoragarh	5		18.93	77.0			9.5	
4	Rudraprayag	18	0	5.15	229.5	3	0	0	4
5	Uttarkashi	35	10	93.00	1,308.3	47	28	43	44
6	Almora			24.50	9			2.5	
7	Champawat			28.00	121				
8	Dehradun	37	4	271.50	28	4	0	85.5	500
9	Haridwar	13	0	137.60	0	4	2	13	492
10	Nainital	0	0	150.00	0	0	0	0	0
11	Pauri	4	9	198.10	111.5	0	4	0	450
12	Tehri	12	15	26.00	223.9	12	12	83	88
13	Udham Singh Nagar	1		45.50		1			
	Total	149	50	998.28	2,544.6	76	63	247.5	1,787

Source: Government of Uttarakhand (2013)

(2) Roads

The road subsector in the State comprises of road infrastructure, which is primarily administered by the Public Works Department (PWD).

The PWD is responsible for planning, financing, constructing, and maintaining roads, bridges, and related government buildings.

The disaster has caused damages of about 2,174 roads, 85 motor bridges and 140 bridle bridges. Connectivity to about 4,200 villages has been affected. A large number of vehicles have been washed away, buried under debris, fallen off the hill, or stranded at cut-off locations.

Table 1.2.3 Summary of Damage to BRO, National and State Road Infrastructure

Districts	Roads with Border Road Organization (BRO)	National Highway (NH)	State Highway (SH)
Part A-Worst affected Districts			
Total (km)	935.00	61.18	253.00
Part B-The other Eight Districts			
Total (km)	161.00	248.25	787.40
Grand Total- A and B (km)	1096.00	309.43	1040.40

Source: Government of Uttarakhand (2013)

Out of a total number of 2,174 closed roads, 1,784 roads have been restored and connectivity to 3,771 villages out of the total number of 4,200 cut-off villages has been restored. However, the current restoration of connectivity is only through temporary measures so as to facilitate the movement of vehicles, people and animals.

Table 1.2.4 Summary of District-Wise Damage to Other Road Infrastructure

Districts	MDR (km)	ODR (km)	Village Roads PWD (km)	Village Roads – PMGSY (km)	Bridle Roads (km)	Motor bridges (nos)	Bridle Bridges (nos)
Part A-Worst affected Districts							
Bageshwar	75.00	55.0	79.09	25.50	6.00	1	18
Chamoli	86.00	124.00	253.61	69.86	76.40	1	26
Rudraprayag	27.00	24.00	143.38	81.47	31.15	4	25
Uttarkashi	81.00	12.00	389.91	49.33	49.30	7	12
Pithoragarh	17.00	-	250.61	20.77	108.5	2	26
Total	286.00	215.0	1,116.6	246.93	271.4	15	107
Part B-The other Eight Districts							
Almora	169.00	178.50	66.91	23.56	-	-	3
Champawat	12.00	7.00	261.38	20.65	-	-	-
Dehradun	79.60	47.60	439.52	30.02	-	31	2
Haridwar	47.00	17.30	49.00	-	-	2	-
Nainital	37.00	6.00	180.48	22.51	27.00	-	-
Pauri	88.00	120.00	964.14	101.57	5.6	2	7
Tehri	82.00	79.00	769.39	40.39	132.4	35	21
Udham Singh Nagar	6.00	1.00	215.55	-	-	-	-
Total	520.6	456.4	2,946.37	238.7	165.0	70	33
Grand Total	806.6	671.0	4,062.90	485.63	436.4	85	140

Source: Government of Uttarakhand (2013)

(3) Irrigation Infrastructure and Flood Protection Works

The 2013 disaster caused damages to 495 km length of canal works out of the total length of 11,702 km. In the five most affected districts, Bageshwar, Chamoli, Pithoragarh, Rudraprayag and Uttarkashi,

the total damage to the canal works is 205 km. Out of 394 km of flood protection works, 74 km has washed away by the flood waters in Uttarakhand.

In the five most affected districts, from a total 45 km of flood protection work, 25 km has been washed away. The total command area under irrigation is 333,800 ha and due to the damages sustained by the irrigation infrastructure, 38,330 ha have been affected in the State. The detailed assessment on the actual damage in the worst affected areas is still in progress and will take time, as some of the areas are still inaccessible, especially in the Kedarnath valley.

The total preliminary estimate of damages for the State is estimated to be around INR 2,440 million. The estimated value is based on rough estimates and does not take into consideration the reconstruction needs.

Table 1.2.5 Damage to Irrigation Infrastructure

Name of work	Total No. of Works	Damaged No.	Total Length (km)	Damaged Length (km)	Total Command Area (ha)	Affected Command Area (ha)
No. of Canals	2,740	1,542	11,702	495	209,502	33,181
No. of Flood Protection Works	891	508	394	74		
No. Lift Canals	166	60	-	-	5,041	1,999
No. of Lakes	9	2	-	-		
No. of Barrages	5	1	-	-		
No. of Tube Wells	1,248	53	-	-	30,683	3,151
No. of Buildings	-	12	-	-		

Source: Irrigation Department, Uttarakhand (2013)

The total estimated cost of rehabilitation of irrigation infrastructure in the five districts of Bageshwar, Chamoli, Pithoragarh, Rudraprayag and Uttarkashi is INR 1,393 million (USD 23.22 million). The rehabilitation cost for the district of Uttarkashi alone, which sustained the highest damage, is estimated at INR 690 million (USD 11.5 million).¹

Table 1.2.6 Preliminary Estimate of Damage to Irrigation Infrastructure

District	Estimated Needs	
	INR million	USD Million
Uttarkashi	690.0	11.50
Chamoli	168.0	2.80
Rudraprayag	307.0	5.12
Bageshwar	57.6	0.96
Pithoragarh	170.4	2.84
TOTAL	1,393.0	23.22

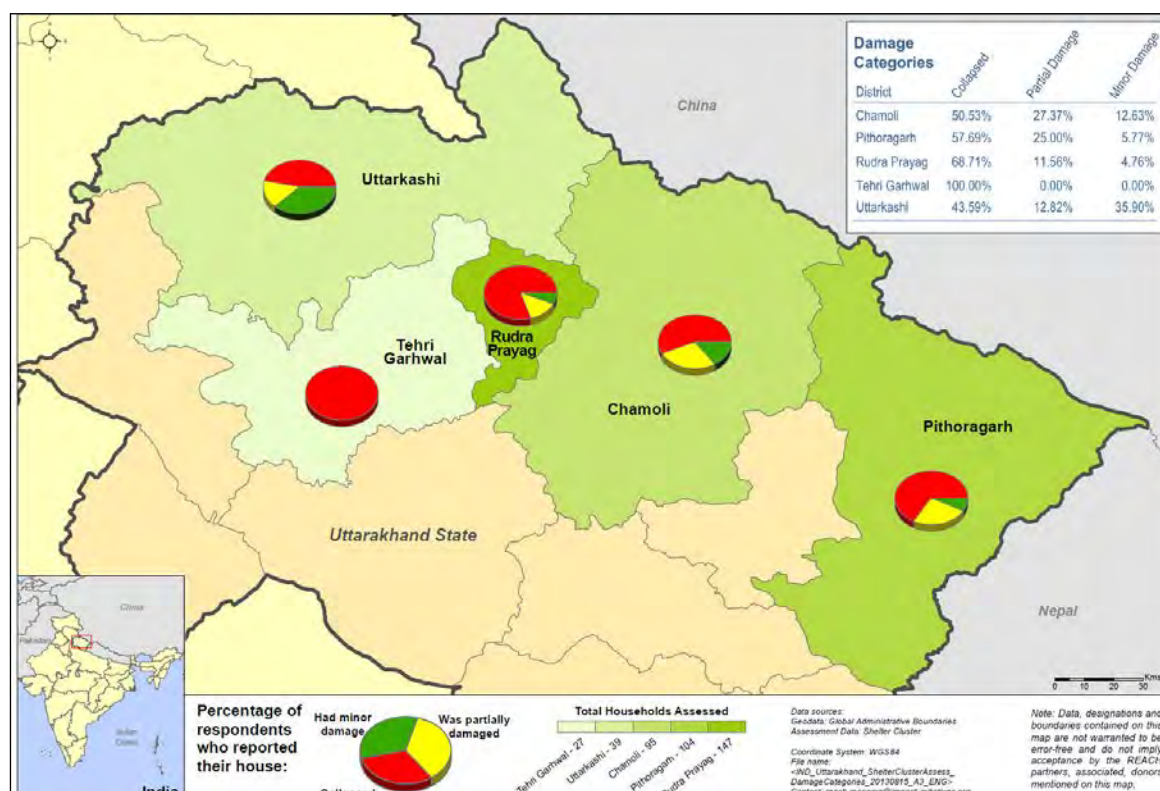
Source: Irrigation Department, Uttarakhand (2013)

It needs to be noted that, the Superintending Engineer, Department of Irrigation, Uttarakhand, stated an estimate for reconstruction in the region of INR 17,000-20,000 million of irrigation infrastructure and river training, during the meeting with the JICA Survey Team on 25 September 2013,

(4) Shelter

Damage to shelters is shown below.

¹ INDIA: Uttarakhand Disaster June 2013, Joint Rapid Damage and Need Assessment, GoUK, WB, ADB. P. 36, para. 71



Source: Sphere India <http://www.sphereindia.org.in/>

Figure 1.2.1 Shelter Damage Categories

(5) Agriculture

75% of Uttarakhand's population depends on Agriculture². Out of the total reported area of 5.67 million ha, 723,000 ha (13%) is under cultivation. The net irrigated area of the state is 340,000 ha, which is mostly confined to the plains while most of the cultivated area in the hills is rain fed. Land holdings in the hilly areas are small and scattered, and productivity of subsistence cereals is low (1,200 – 1,400 kgs/ ha in the hills, against 3,200 – 3,500 kgs/ ha in the plains) and consequently the corresponding agriculture income is low. The incidence of poverty is about 40% higher in Uttarakhand than the national average³.

Table 1.2.7 Loss of Crop and Agriculture Land

District	Total Affected Crop Area (ha)	Total Area Silted (ha)	Total Area Washed Away (ha)
Bageshwar	6	7	5
Chamoli	445	314	205
Pithoragarh	364	173	190
Rudraprayag	1,040	450	650
Uttarkashi	155	-	155
TOTAL	2,010	944	1,206

Source: Department of Agriculture, Government of Uttarakhand

² Uttarakhand State Profile 2011

³ Source: The World Bank

Table 1.2.8 Estimated Loss to Agriculture Sector

District	Estimated Cost in USD				Total USD
	Lands Lost	Lands Silted	Crop Losses	Damage to Infrastructure	
Bageshwar	11,000	1,750	1,700		14,450
Chamoli	426,000	78,400	62,000		566,400
Pithoragarh	397,000	43,000	124,500		564,500
Rudraprayag	1,353,000	112,500	268,000		1,733,500
Uttarkashi	323,000	-	64,770		387,770
TOTAL	2,510,000	235,650	520,970	983,000	4,249,620

Source: The World Bank (2013)

The impact of the disaster on the agricultural sector has been severe. Heavy rains have severely eroded the agricultural land in many villages, while in the plains, crops have been damaged due to inundation. Given that agriculture is the main livelihood for most of the population in the affected areas and most of the farmers in Uttarakhand come under the small and marginal category of land holdings, the disaster has severely impacted their livelihoods⁴.

Based on the reported damages as of July 29, 2013, total damages and direct losses in the five districts were estimated at INR 255 million (USD 4.25 million). The Uttarakhand Agriculture Department is in the process of carrying out detailed assessments in the field and more precise data will be available once these assessments are completed. According to the estimates, the main damage is due to the washing away of lands and the worst affected district in terms of agriculture is Rudraprayag⁵.

(5) Horticulture

Out of a total geographical area of 5.35 million hectare, about 750,000 ha comes under agriculture, of which horticulture accounts for 300,000 hectares, with about 120,000 farmers attached to it. 88% of these are small and medium farmers. The total revenue of the horticulture sector is of around INR 20,000 million (USD 333.3 million) per annum⁶.

The main categories of horticultural crops grown in Uttarakhand include: fruits, vegetables, potato, spices, medicinal plants and aromatic plants. The colder climate of the State's hilly terrain is suitable for fruit crops such as apple, almonds, plums, pears, apricots, peaches, and walnuts, whereas the plain areas of the State are suitable for mangoes, guava, strawberry, lichees, melons, etc. The state's climate is also suitable for lemons and has the potential for the production of mushrooms, honey, silk and tea. The State government, through various schemes, is in the process of tapping into this potential.

Table 1.2.9 Horticultural Crop Area Damaged (All Districts)

Category of Horticultural Crop	Area Affected (ha)
Fruits	5,692
Vegetable & Spices	7,289
Aromatic Plants	2,518
Medicinal Plants	38
Tea cultivation	0.3
TOTAL	15,537

Source: Department of Horticulture, Government of Uttarakhand (2013)

⁴ Source: The World Bank

⁵ Source: The World Bank

⁶ Horticulture Department Annual Report 2012-2013

Table 1.2.10 Horticultural Crop Loss in All Districts

Category of Horticultural Crop	Estimated Loss (USD Million)	INR million
Fruits	19.74	1,188
Vegetable & Spices		
Aromatic Plants	1.00	60
Medicinal Plants	0.25	15
Tea cultivation	0.03	1.8
TOTAL	21.02	1,261.2

Source: The World Bank (2013)

The crop loss is estimated to be as high as INR 1,260 million (USD 21 million). These figures are preliminary estimates, as detailed field assessments are still being conducted. In addition to the crop losses, the disaster caused damages to the horticulture department's infrastructure including nurseries and buildings - the estimated damages are to the tune of INR 40 million (USD 0.67 million).

Table 1.2.11 Impact on Horticulture in the Five Districts

District	Total Damages and Losses	
	USD Million	INR Million
Bageshwar	0.2	12
Chamoli	4.4	264
Uttarkashi	8.1	486
Rudraprayag	2.9	174
Pithoragarh	4.2	252
TOTAL	19.80	1,188

Source: The World Bank (2013)

In horticulture subsector, provision of essential farm inputs and land preparation support to farmers could be provided as a subsidy to purchased inputs and should be given to small and poor farmers on a preferential basis. Since market routes have been damaged, there is a critical need to support the farmers to re-build market routes so that they are able to take their produce to the market. This includes putting up ropeways. There have been several examples especially from the hilly regions of Nepal where ropeway has proved to be a huge asset leading to enhanced livelihoods of the community. These ropeways are used to transport vegetable and fruits from far off areas to the market. One of the NGOs called Practical Action has come out with some very successful models on the same⁷.

(6) Livestock

The rearing of livestock is an integral part of the farming system in the hills and it is carried out in more than 70% of rural households of the State, supporting the livelihoods of these farmers in part or in full. Farmers are dependent on livestock for milk, meat, eggs, wool, skins, manure for fertilizer and the draught power for all agricultural operations in the hills.

The total number of animals that died in the selected five districts, reported as of July 29, 2013 is 11,047 which are 62% of the total animals dead in the State and the estimated value of the dead animals is INR 144 million (USD 2.4 million). The production losses associated with the livestock damage are significant and have not been estimated here as they depend on the time taken to restore infrastructure and provide the new animals and required inputs to the farmers.

⁷ <http://practicalaction.org/nepal>

Table 1.2.12 Domestic Animal Mortality and Estimated Damage

District	Cow	Buffalo	Bullock	Sheep/ Goat	Poultry	Other	TOTAL
Bageshwar	4	3	3	440	-	1	454
Chamoli	12	26	23	743	-	-	932
Pithoragarh	290	61	94	3,459	-	88	4,226
Rudraprayag	19	57	24	2,741	300	-	4,301
Uttarkashi	34	21	9	1,063	-	-	1,134
TOTAL	359	168	153	8,446	300	89	11,047

Source: The World Bank (2013)

Table 1.2.13 Number of Horses, Mules, Donkeys Dead

District	Equines
Bageshwar	3
Chamoli	128
Pithoragarh	234
Rudraprayag	1,160
Uttarkashi	7
TOTAL	1,532

Source: The World Bank (2013)

Livestock production in Uttarakhand is mainly carried out by the small and marginal farmers and takes place in small holdings scattered across the state. The predominant farming system in the state is a mixed crop-livestock farming system, most of it being rain fed. Stock holdings are small, often made up of a mix of several species, except in the case of nomadic pastoralists herding sheep and goats. Over 80% of all the species are owned by the marginal and small farmers, along with some by the landless.

The livestock survey of 2007 estimates that the total asset value of livestock in the state is INR 81,060 million (USD 1351 million) and the estimated value of the annual livestock produce is INR 34,200 million (USD 570 million)⁸.

(7) Tourism

The tourism sector makes up about 25% of Gross State Domestic Product (GSDP). The total number of tourists in Uttarakhand per year as per the census of 2011 were 32.0 million of which the pilgrimage circuit, commonly called as the “*Char dham*” (four pilgrimage sites) circuit accounted for 2.2 to 2.4 million. The circuit takes about 9-10 days to cover all four pilgrimage sites. Majority of the tourists in 2011 were from Gujarat, Bengal, Rajasthan and Uttar Pradesh. A small proportion of tourists were from Punjab, visiting Hemkund. It is estimated that about 60% of the pilgrims covered the entire circuit of four *dhams*, 30% visited only two *dhams* and the remaining 10% visited only one of the two *dhams* of Gangotri or Badrinath. The peak tourist season falls between April- July, with the main influx during the school holiday period from mid-May to end June⁹.

The livelihoods of 83,320 households from the affected five districts depend on the tourism sector¹⁰. This includes small businesses such as hotels and restaurants (6500), petty traders (23,000) such as road side tea stalls and roadside eateries (*dhabas*), fruit and vegetable vendors, handicraft vendors, taxi and bus drivers, palanquin bearers (*dandi kathi*) who carry pilgrims and goods up the steep slopes of the two dhams, and the priests. It is estimated that the people working in the hotels and restaurants earn an average income between INR 7,000-15,000 (USD 115 – 250) whereas the petty shop owners earn between INR 4,000-8,000 (USD 66 – 132) per month¹¹. The livelihoods of the people dependent

⁸ Livestock Census 2011, Department of Animal Husbandry

⁹ Source: The World Bank

¹⁰ Bhageshwar (5224), Chamoli (6879), Pithoragarh (19505), Rudraprayag (18949), Uttarkashi (32763)

¹¹ Source: The World Bank

on tourism to a large extent has been the worst affected. Around 60% of the population which has been impacted had tourism as their primary source of income.¹²

Table 1.2.14 Loss in Tourism Sector

	Category	Preliminary Needs Estimates	
		(million INR)	(million USD)
1	Destination Development/ Site and Services	158.5	2.64
2	Ghat Development	88.00	1.47
3	Night shelters	117.50	1.96
4	Tourist Information /Convenience Center	31.5	0.53
5	Toilet Blocks/Complexes	97.60	1.63
6	Tourist Rest Houses	568.50	9.48
7	Miscellaneous	104.5	1.74
Total		1,166.10	19.44

Source: Christian Aid

1.2.3 Photos of Disasters

Uttarakhand Space Application Centre has been identified by State Government as a nodal agency for establishment of SNRMS (Establishment of State Natural Resources Management System) in the state.

Before and after disaster images are compared by means of satellite photographs as shown in the figure below:



Source: Uttarakhand Space Application Centre : <http://www.u-sac.in/gallery/Kedarnath-Disaster@USAC/index.html>

Figure 1.2.2 Satellite Imageries showing the difference before and after the disaster

¹² Source: Interview with the District Magistrate, Dehradun

Damaged Kedarnath is located at the bottom of glaciated valley. Glaciated terrace (or glacial lake) is seen in the left bank. Therefore, the settlement had a condition that was extremely vulnerable to the flood disaster.



Uttarakhand Space Application Centre : <http://www.u-sac.in/gallery/Kedarnath-Disaster@USAC/index.html>

Figure 1.2.3 Photographs of Kedarnath

The river sediment which consists of old deposits has a tendency to erode easily.

The conditions before and after disaster are as shown in figure. The settlement received a catastrophic damage by debris flow.



<http://www.dailymail.co.uk/indiahome/indianews/article-2349048/Devastating-floods-Uttarakhand-disaster-waiting-happen.html>
(Around Kedarnath Temple)



<http://www.dailymail.co.uk/indiahome/indianews/article-2346991/The-y-touched-hearts-The-selflessness-Uttarakhand-soldiers-angels-hope-thousands-caught-devastating-floods-landslides.html>



<http://www.dailymail.co.uk/indiahome/indianews/article-2351704/Dramatic-satellite-images-flood-ravaged-Uttarakhand-reveal-irrevocable-damage-region-forever-altered-climatic-disaster.html>

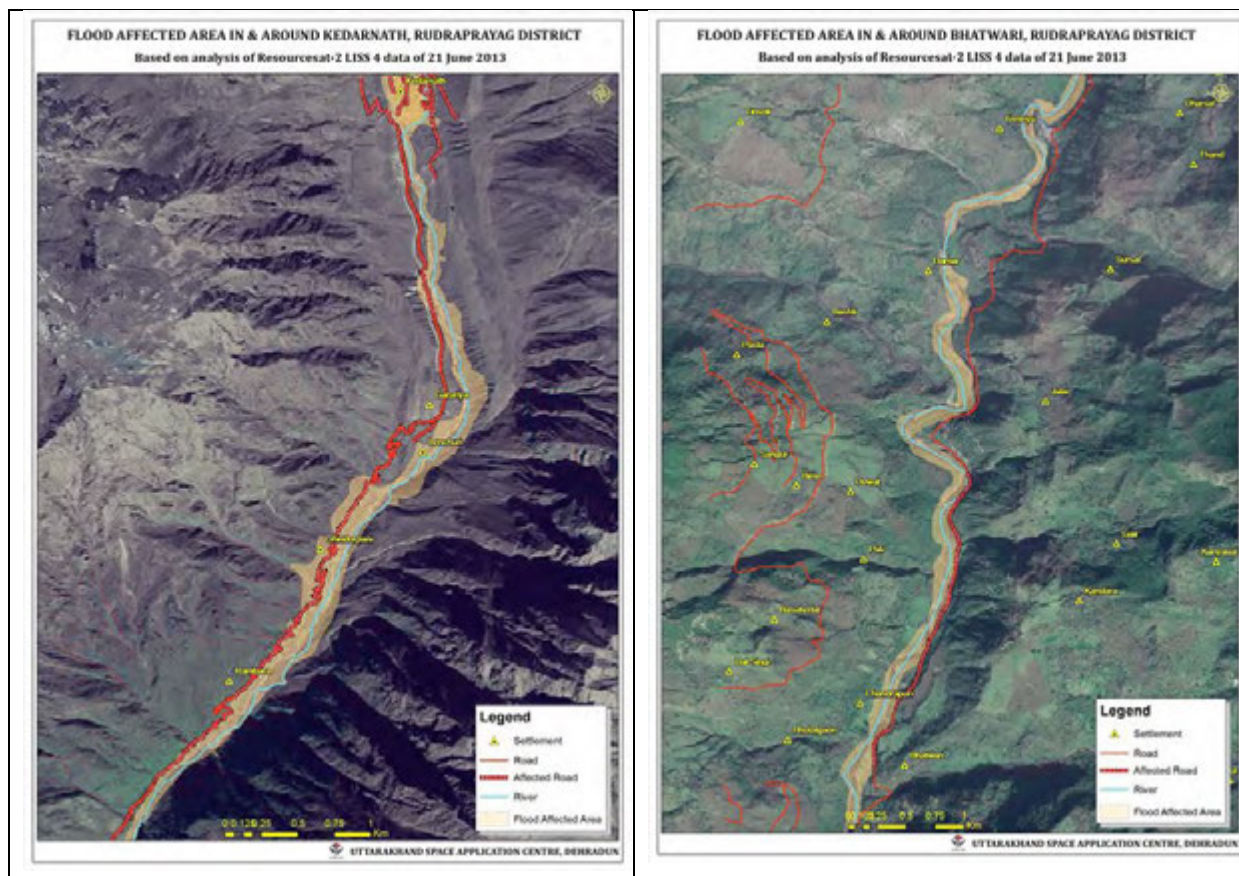


<http://www.desidime.com/forums/dost-and-dimes/topics/uttrakhand-disaster-images-helpline-number-also-included>

Source: Photographs from the various sources compiled by JICA Preparatory Survey Team

Figure 1.2.4 Photographs showing the Damages caused by the Disaster in June 2013

Uttarakhand Space Application Centre (USAC) and National Remote Sensing Centre (NRSC) analyzed the condition of post disaster landscapes using satellites.



Source : Uttarakhand Space Application Centre : <http://www.u-sac.in/gallery/Kedarnath-Disaster@USAC/index.html> Compiled by JICA Preparatory Survey Team

Figure 1.2.5 Analysis conducted by USAC and NRSC on Post Disaster Landscape based on the satellite imageries

Chapter 2 SITE INVESTIGATION

2.1. First Site Inspection

First site inspection was conducted in the following area on 30th Aug. 2013. This site inspection covered upper northern part of Uttarakhand towards Kempty falls to Jamuna bridge, Kalisi Forest Division, Dakpathar, Vikashnagar, Herbertpur, Rampura. The location is as shown in figure.



Figure 2.1.1 Site Inspection Map

(1) Site No.6

This site is a sightseeing area and characterized by the waterfall and pool which are constructed in the bottom of the valley. The slope failure occurred next to the waterfall.

The weathered rocks are distributed. And many cracks are observed in Kempty water fall area, Uttarakhand.



Source: JICA Preparatory Survey Team
Figure.2.1.2 Slope Failure
Distributed in the Sightseeing Area

(2) Site No.12

In Vikasnagar, the slope failure occurred at the top of concave landform as shown in the site photographs below. The site is along the Barkot Road in Jakhnoj Bhisto. The failure sediment flowed out as debris flow. Weathered rocks are distributed in this area.



Source: JICA Preparatory Survey Team

Figure 2.1.3 Slope Failure in Concave Landform

(3) Site No.13

This is a site where slope failures which was caused by river erosion Especially, the existing countermeasures without foundation work are affected by river erosion.

Weathered rocks are observed in the area where the slope failures occurred.



Source: JICA Preparatory Survey Team

Figure 2.1.4 Road Shoulder Failure Occurred along the River (Rajbala Road in Dhalin in Kalsi Forest Division)

2.2. Second Site Inspection

Second site inspection was conducted in the following area between 3 and 4 September 2013 towards the north east of Dehradun passing through Karligarh road, Motihar road, Chamba, Tehri dam and Rishikesh road.

The location is as shown in below.

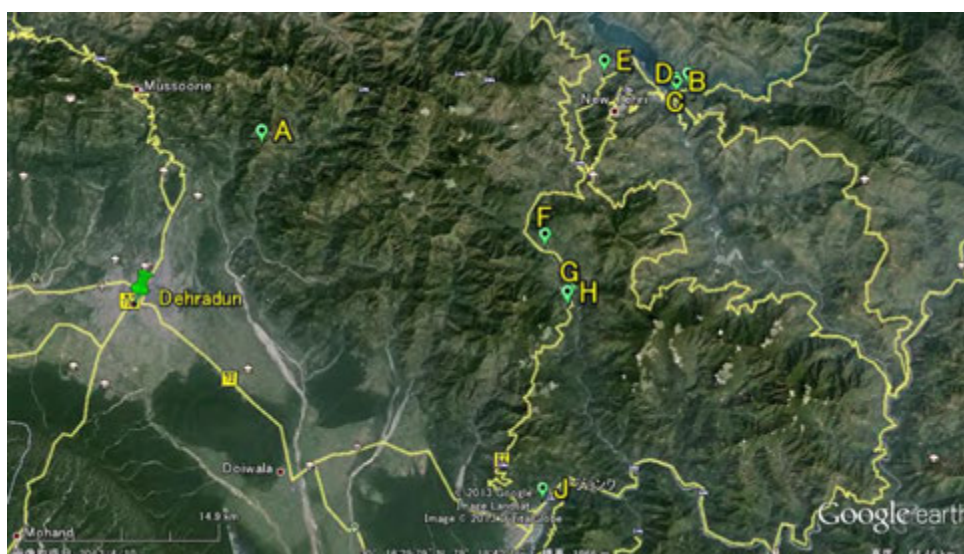


Figure 2.2.1 Site Inspection Map

(1) Site A

The slope failure occurred at the top of concave landform in the forest department area in 2010 along Karligarh Road and Motidhar no 1A.

The failure sediment flowed out in the form of debris flow on the steep slope. Due to debris flow, seven people who lived along the river in the downstream area died.

The retaining wall is constructed along the road. The bed rock with many cracks is observed.

At present, countermeasures are planned by the Mussorie Forest Division.



Source: JICA Preparatory Survey Team

Figure 2.2.2 Condition of Site A

(2) Site C

This site is located at the left bank of the Tehri dam site.

The slope failure occurred along the road in the concave slope. The failure sediment flowed out on the left bank of the dam.

The strongly weathered rocks are observed, so the slope failure is presumed to be occurred continuously.

Detailed investigation and mechanism analysis are required.



Source: JICA Preparatory Survey Team

Figure 2.2.3 Condition of Site C (1)



Source: JICA Preparatory Survey Team

Figure 2.2.4 Condition of Site C (2)

(3) Site H

This site is located at the concave landform along Rishikeshi- Tehri Road. .

The sediment is in unstable condition. This phenomenon is presumed to be landslide.

The old sediment is observed along the concave slope. The cause of this landslide is presumed due to the supply of an excessive groundwater. As far as future movement is likely and the detailed investigation and mechanism analysis are required



Figure 2.2.5 Condition of Site H (1)

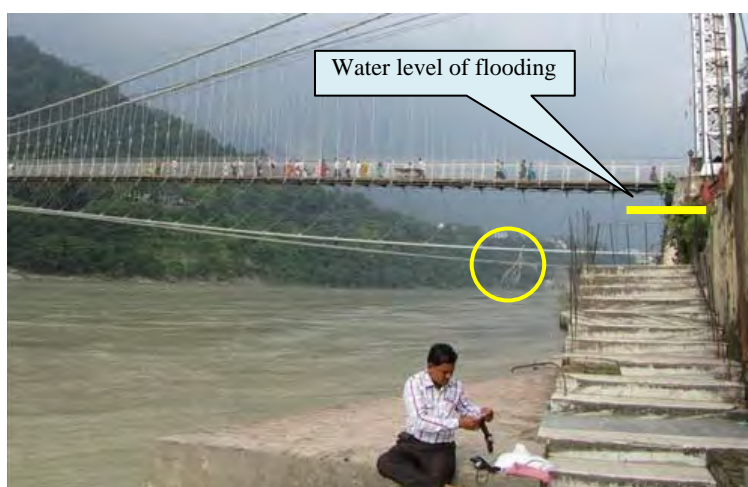


Source: JICA Preparatory Survey Team

Figure 2.2.6 Condition of Site H (2)

(4) Site J

This site is located at the exit of the valley of the Ganga River in Rishikesh. The high water level at the time of flooding is as shown in the figure below. Almost no obvious damages by flood was observed in this area.



Source: JICA Preparatory Survey Team

Figure 2.2.7 Condition of Site J in Rishikesh

2.3. Third Site Inspection

Third site inspection is conducted between 20 and 22 September 2013 in Rishikesh, Devprayag and Joshimath. The location is as shown below.

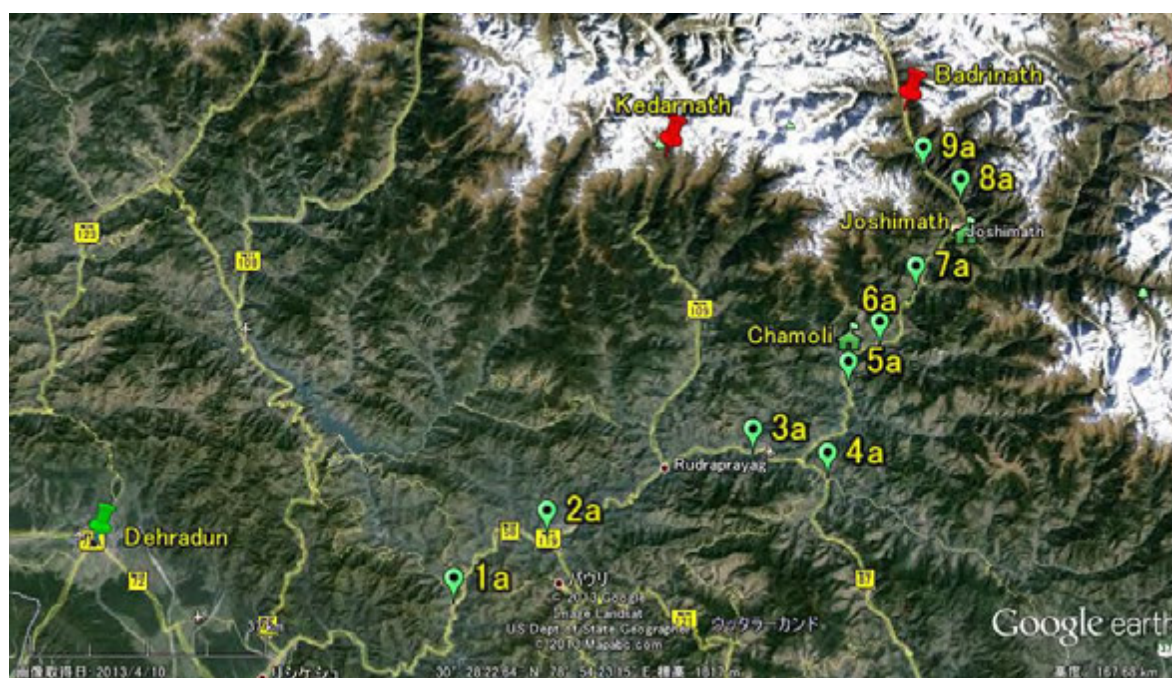


Figure 2.3.1 Site Inspection Map

(1) Site 2a

The river terraces (low and high terraces) and taluses are generally distributed in places along the Ganga River located in Srinagar along Rishikesh Road. And the gentle slopes which formed in and after the glacier age are distributed in places on the mountainside along the Ganga River. Many villages are located on the terraces or the gentle slopes.

Especially, the lower terraces are exposed to the flood risk. Flood inundation marks are observed along the road. Probably, this time flood inundation is presumed to be affected by the bottleneck which is located at the downstream of the town.



Source: JICA Preparatory Survey Team

Figure 2.3.2 Flood Inundation Mark (Anthrag Dang)

(2) Site 5a

The landslide phenomena are clearly observed in Vijay Nagar Kafal Khet near Chamoli District.. Many cracks are observed in and around the building located on the boundary of landslide.

The landslide movements are presumed to be affected by river erosion. Therefore, the river training is judged to be required for the sake of the stability of landslide.



Source: JICA Preparatory Survey Team

Figure 2.3.3 Landslide by River Erosion

(3) Site 6a

The lower terrace is observed at the left bank in the condition before disaster. The main stream flows along the right bank. But this lower terrace is almost flushed out by flood.

Buildings and national highway are located on the talus which consists of sediment as in below.

Therefore, this talus is exposed to the river erosion risk in the future. The river training is considered to be required immediately.



Source: JICA Preparatory Survey Team

**Figure 2.3.4 Area where River Training is Required
(Birahi village near Garhwal Mandal Vikash Nigam Guest House on Highway 58)**

(4) Site 9a

Lambagarh village is about 12 km from Joshimath. This village was located on the lower terrace and gentle slope. The lower terrace and a part of gentle slope were flushed out by flood.

According to hearing investigation, human suffering did not occur because village people evacuated to safer places in advance.

The change of the flow channel was caused by flood. The gentle slope which consists of rocky soil and sand is concerned to be flushed out by river erosion in the future. Therefore, river training is required immediately.



Source: JICA Preparatory Survey Team

Figure 2.3.5 Damage in Lambagarh Village

Chapter 3 **PRESENT INSTITUTIONAL FRAMEWORK FOR DISASTER MANAGEMENT**

3.1 Disaster Management Framework of India

3.1.1 Disaster Management Act of India 2005

In 2005, the Disaster Management Act of India came into effect to address the occurrences of various types of both natural and manmade disasters and shift from a response and relief-centric approach to a proactive, and comprehensive mindset towards disaster management, covering all aspects from prevention, mitigation, preparedness to rehabilitation, reconstruction and recovery.

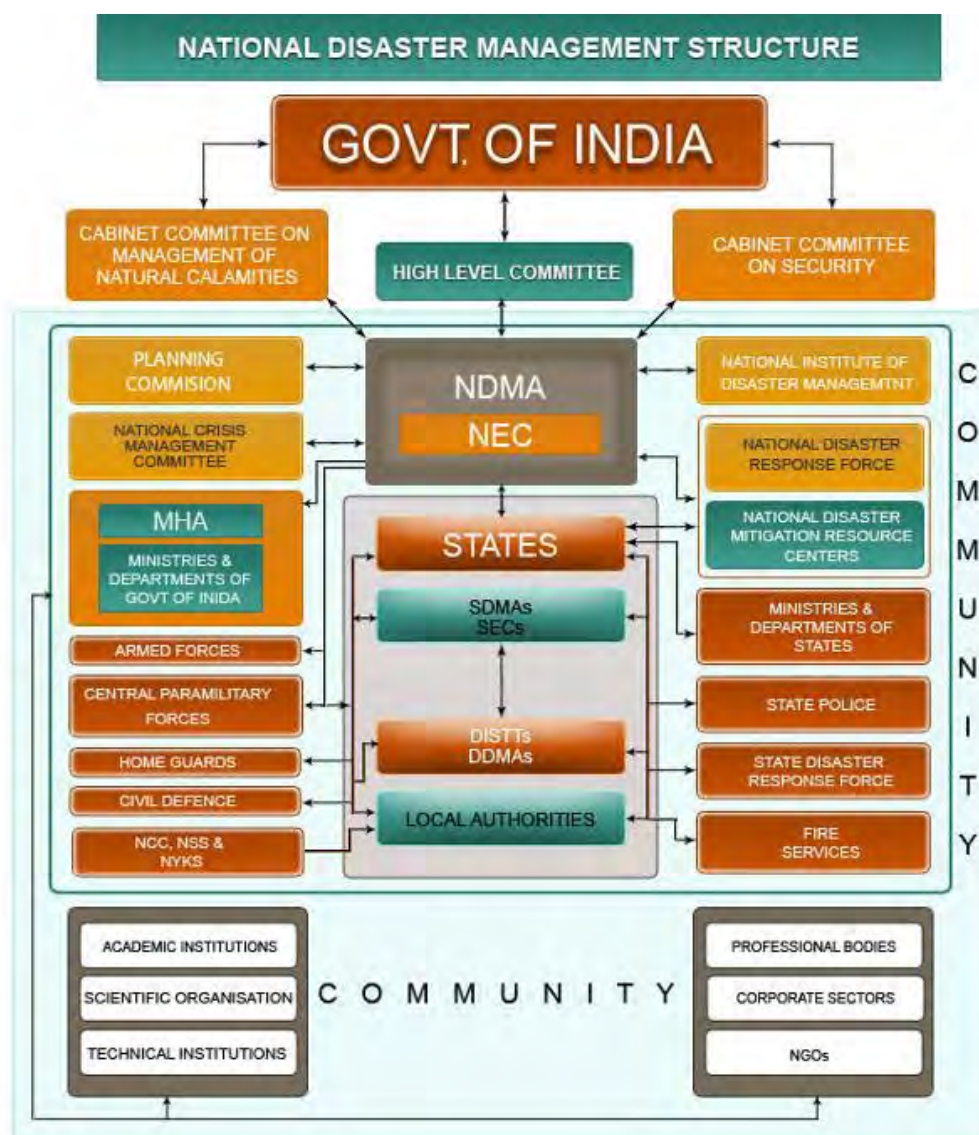
The vision of the Act is to build a safer and disaster resilient India by developing a holistic, proactive, multi-disaster and technology driven strategy for Disaster Management (DM). This will be achieved through a culture of prevention, mitigation and preparedness to reduce the impact of disasters on people. The entire process will centre stage the community and will be provided momentum and sustenance through the collective efforts of all government agencies supported by Non-Governmental Organizations (NGOs).

The Act also provides for the creation of a policy, legal and institutional framework, backed by effective statutory and financial support. The mainstreaming of multi-sectoral DM concerns into the developmental process and mitigation measures through projects.

Through the Act, the National Disaster Management Authority (NDMA) was created. The Act mandates the NDMA to lay down policies and guidelines for the statutory authorities to draw their plans. In essence, the NDMA will concentrate on prevention, mitigation, preparedness, rehabilitation and reconstruction and also formulate appropriate policies and guidelines for effective and synergized national disaster response and relief. It will coordinate the enforcement and implementation of policies and plans. Towards this, NDMA has the following responsibilities:

- 1) Lay down policies on disaster management ;
- 2) Approve the National Plan;
- 3) Approve plans prepared by the Ministries or Departments of the Government of India in accordance with the National Plan;
- 4) Lay down guidelines to be followed by the State Authorities in drawing up the State Plan;
- 5) Lay down guidelines to be followed by the different Ministries or Departments of the Government of India for the Purpose of integrating the measures for prevention of disaster or the mitigation of its effects in their development plans and projects;
- 6) Coordinate the enforcement and implementation of the policy and plan for disaster management;
- 7) Recommend provision of funds for the purpose of mitigation;
- 8) Provide such support to other countries affected by major disasters as may be determined by the Central Government;
- 9) Take such other measures for the prevention of disaster, or the mitigation, or preparedness and capacity building for dealing with the threatening disaster situation or disaster as it may consider necessary; and
- 10) Lay down broad policies and guidelines for the functioning of the National Institute of Disaster Management.

The national disaster management structure is illustrated in the figure below.



Source: <http://ndma.gov.in/ndma/dmstructure.html> (Accessed on 31st Jan 2014)

Figure 3.1.1 National Disaster Management Structure

3.1.2 National Disaster Management Plan

Section 23 of the Disaster Management (DM) Act 2005 provides that there shall be a DM plan for every state. NDMA and National Institute of Disaster Management (NIDM) were established under Ministry of Home Affairs to draw up the National Disaster Management Plans as a guideline for the state plans.

The national plan/ guideline outlines the broad coverage of the plan as well as the requirements of consultation in the preparation of the state plans. It also provides for annual review and updating of the state plan, and enjoins upon the state governments to make provisions for financing the activities to be carried out under the state plans. It provides for the departments of the state governments to draw up their own plans in accordance with the state plan.

The state plans shall be prepared by the State Executive Committee (SEC) in conformity with the guidelines to be issued on related matters by the State Disaster Management Authority (SDMA) having regard to the guidelines laid down in this regard by the NDMA, and after such consultation with local and district authorities and the people's representatives as the SEC may deem fit. The state plan prepared by SEC shall be approved by the SDMA.

Ideally, state DM plans should be made after vulnerability assessment and risk analysis of a state have been undertaken. Guidelines issued by the NDMA will also need to be internalized in these plans.

The central ministries and departments, and state governments concerned in landslide affected areas will designate nodal officers responsible for landslide management activities and for effective formulation and implementation of the disaster management plans. The policies, initiatives and activities of these agencies will address the concerns of all stakeholders involved in the development, management and maintenance to build environment that ensures safety.

Even though this process has begun, it is likely to take some time. It is felt that the preparation of plans cannot, and should not, await the outcome the disaster risk analysis. On the basis of extant information and knowledge, a plan should be formulated by every state and updated regularly adding fresh inputs on an ongoing basis. Pending detailed micro-level vulnerability assessment and risk analysis, information as currently available about the vulnerability profile of different areas of a state, including information contained in the Vulnerability Atlas of India published by the Ministry of Urban Development may be incorporated in the plan.

Table below shows the summary of guideline:

Table 3.1.1 National Disaster Management Planning Guideline

Objectives	<ul style="list-style-type: none"> Promoting a culture of prevention and preparedness by ensuring that DM receives the highest priority at all levels. Ensuring that community is the most important stakeholder in the DM process. Encouraging mitigation measures based on state-of-the-art technology and environmental sustainability. Mainstreaming DM concerns into the developmental planning process. Putting in place a streamlined and institutional techno-legal framework for the creation of an enabling regulatory environment and a compliance regime. Developing contemporary forecasting and early warning systems backed by responsive and fail-safe communications and Information Technology (IT) support. Promoting a productive partnership with the media to create awareness and contributing towards capacity development. Ensuring efficient response and relief with a caring approach towards the needs of the vulnerable sections of the society. Undertaking reconstruction as an opportunity to build disaster resilient structures and habitat. Undertaking recovery to bring back the community to a better and safer level than the pre-disaster stage.
Levels of Disasters	<ul style="list-style-type: none"> The approach to the preparation of the state DM plan should be holistic and address all the hazards to which the state is vulnerable. It should take into account past lessons and experiences, build on good existing systems at different levels. It should address the need to streamline the systems and develop operational and management procedures. The state plan may also adopt the generic categorization of disasters with specific plans at the state level by various departments to handle different disasters. The levels of disasters have already been categorized and disseminated as L0, L1, L2 and L3, based on the ability of various authorities to deal with them. Various color codes relating to the level of alerts have also been assimilated.

	<ul style="list-style-type: none"> • L0 denotes normal times which are expected to be utilized for close monitoring, documentation, prevention, mitigation and preparatory activities. This is the planning stage where plans at all levels from community to the State shall be put in place. Training on search and rescue, rehearsals, evaluation and inventory updation for response activities will be carried out during this time. • L1 specifies disasters that can be managed at the district level, however, the state and centre will remain in readiness to provide assistance if needed. • L2 specifies disaster situations that may require assistance and active participation of the state, and the mobilization of resources at the state level. • L3 disaster situations arise from large-scale disasters where districts and the state may not have the capacity to respond adequately and require assistance from the central government for reinstating the state and district machinery. • Even though there cannot be watertight compartmentalization of responsibilities between states and the centre, especially in the case of man-made disasters, the participation by the Centre will normally be at the L3 level.
Indicators	<p>The plans will specify monitoring mechanisms with the following indicators:</p> <ul style="list-style-type: none"> i) Frequency of damaging landslides. ii) Loss assessment. iii) Mitigation methods used. iv) Number of buildings being built on land at risk. v) Land subject to landslide activity being set aside/purchased. vi) The awareness level of the community.

Source : National Disaster Management Authority Government of India July 2007

<http://ndma.gov.in/ndma/guidelines/SDMP.pdf>

NIDM works positively for education on natural disaster management as well. The list of key publication is shown below:

- Environmental Statistics and Decision Support Systems for Disaster Risk Management 2011
- Adaptation to Climate Change with a Focus on Rural Areas and India 2011
- Master's module Disasters, Environment & Risk Reduction (Eco-DRR) 2013
- Risk to Resilience ; Strategic Tools for Disaster Risk Management 2010
- Flood Disaster Risk Management: Gorakhpur Case Study 2013

NIDM also draws up a manual on "Management of Landslides and Snow Avalanches". This manual provides the details of techniques to be used in monitoring, geological investigations, geotechnical investigations and landslide prevention. It includes a wide range of scientific, planning, and administrative tools to address various aspects of these hazards to effectively reduce losses from them. It aims at sensitizing people on landslide hazards and pursuing mitigating steps armed with scientific, technological, planning, and policy capabilities to eliminate all avoidable losses due to landslides. The mission is to provide and encourage the use of scientific information, maps, technology, and guidance in mitigation techniques, emergency management, land use planning, and development and implementation of government policy to reduce losses from landslides throughout the country.

The process of management of landslides and snow avalanches is illustrated in the manual and summarized in the table below:

Table 3.1.2 Management Process of Landslides and Snow Avalanches

1. Landslide Vulnerability and Risk Assessment	The main purpose of this exercise is to visualize a relationship between landslide hazards, risk, and impact of a landslide, possibly in terms of quantified loss for safer construction. Once the landslide hazard and vulnerability profile are identified, specific risk can be determined. The total risk is then the multiple of the specific risk and elements like population, property, infrastructure, and development activities exposed to landslide hazards.
2. Landslide Risk Zonation	<p>Four data inputs required for risk zonation are environmental factors, triggering factors, historic landslide occurrence and elements at risk. The procedure for the zonation is illustrated below:</p> <pre> graph TD A[The Mapping Framework] --> B[Thematic Maps] A --> C[Landslide Incidence Map] B --> D[Integration and Validation] C --> D D --> E([Landslide Hazard Zonation Map]) E --> F[Risk Zonation Maps] G[Vulnerability Map] --> F H[Elements at Risk Map] --> F </pre> <p>Landslide Management Maps and Procedures</p> <p>Source: NDMA (2009). National Disaster Management Guidelines: Management of Landslides and Snow Avalanches. June, 2009; p33.</p>
3. Geological Investigations	Landslide investigation and mitigation requires mapping of landslide hazards and creation of a knowledge database with the fullest appreciation of the scale and degree of reliability of information gathered. For estimating the destructive potential of a landslide, one needs to know its expanse/ spatial extent and also the time scale of landslide activity, mechanism, run-out distance, elements at risk en route, and its recurrence history. For landslide prediction one needs to find out when and where it will occur, and how far and how fast it will move. For designing of control measures for landslide management, one needs to know the landslide type (its classification), the different possible modes of failure, the location of the landslide boundaries, the operating shear strength characteristics of the boundary shears, and how the pore pressures will vary on the landslide boundaries with time.
4. Geotechnical Investigations	The geotechnical investigation of a landslide includes mapping of the problematic slope at the appropriate scale, scientific understanding of its kinetics, elucidation of the landslide boundaries, determination of representative shear strength parameters and pore pressure variations on the landslide boundaries, and finally, the evaluation of the safety factor. It is important to understand the distinction between first time and reactivated slides. The boundaries of first time slides are not known in advance while reactivated slides generally have predefined boundaries which are sometimes modified due to further sliding.

5. Landslide Remediation Practices	Drainage works include both—surface and sub-surface drainage works. Surface drainage improvement works are implemented to minimize the infiltration of rain water that builds up pore pressure. These include two major components, i.e., drainage collection works and drainage channel works. Surface drainage measures, comprising lined catch water drains above the crown of a slide, lined contour drains at different levels of the slide mass, and lined cascading chute drains, are provided to intercept and divert rain water from the upslope and slide surface to reduce infiltration and the development of pore water pressure substantially. The purpose of subsurface drainage improvement works is to remove the ground water from within the landslide mass. These include shallow and deep sub-surface drainage control works depending upon the nature of the slide. Sub-surface drainage works may include intercept under drains, interceptor trench drains, horizontal gravity drains, drainage wells and drainage tunnels.
6. Landmass Improvement Techniques	The stabilization of hill slopes is also achieved by improving the mechanical characteristics of potentially unstable ground by means of two different approaches: i) The insertion of reinforcement elements into the ground. ii) The improvement of the mechanical characteristics of the ground volume affected by landslides through chemical, thermal or mechanical treatment. Reinforcement technology has found wide application in measures for slope protection. This can be achieved by the installation of large diameter wells supported by one or more crowns of consolidated and possibly reinforced earth columns, anchors, networks of micro piles, nailing and grouting with cement or chemical grouting, depending upon the properties of the material.

Source :NDMA <http://ndma.gov.in/ndma/index.htm>

3.1.3 Relevant Central Government Bodies

(1) Ganga Flood Control Commission

Ganga Flood Control Commission¹ (GFCC), is a subordinate office of Ministry of Water Resources, with its headquarter at Patna, GFCC was created in the year 1972 to deal with floods and its management in Ganga Basin States vide Govt. of India Resolution No. F.C. 47(3)/72 dated 18th April 1972, as secretariat and executive wing of Ganga Flood Control Board, headed by Union Minister of Water Resources, Chief Ministers of basin States or their representative and Members, Planning Commission, are the members of the Board. Chairman, GFCC acts as the Member-Secretary of the Board.

The Commission is headed by a Chairman; assisted by two full time Members; four Directors and 94 supporting staff. The representatives of the concerned Central Ministries as well as Chief Engineers of the basin States are either part-time Members or permanent invitees of the Commission.

Ganga Basin States are Bihar, Chhattisgarh, Haryana, Himachal Pradesh, Jharkhand, Madhya Pradesh, NCT of Delhi, Rajasthan, Uttarakhand, Uttar Pradesh and West Bengal. GFCC carries out several activities as outlined below:

- Preparation and updating of comprehensive plan of flood management.
- Techno-Economic Appraisal of Flood Management Schemes.
- Assessment of adequacy of waterways under road and rail bridges.
- Programming of implementation of flood management works.
- Framing of guidelines for quality control and maintenance.²
- Monitoring of all flood management schemes funded by Central Govt. and important flood management schemes funded by State Government.
- Documentation and Dissemination of recommendations of special studies.
- Performance evaluation of completed Flood Management Schemes.

¹ Website: <http://gfcc.bih.nic.in>

² Guidelines Website: http://www.uttarakhandirrigation.com/popup_ganga_river.html

(2) Central Water Commission

Central Water Commission³ is a premier technical organization in the field of Water Resources and is presently functioning as an attached office of the Ministry of Water Resources, Government of India. The Commission is entrusted with the general responsibilities of initiating, coordinating and furthering in consultation of the State Governments concerned, schemes for control, conservation and utilization of water resources throughout the country, for purpose of Flood Control, Irrigation, Navigation, Drinking Water Supply and Water Power Development. It also undertakes the investigations, construction and execution of any such schemes as required.

Central Water Commission is headed by a Chairman, with the status of Ex-Officio Secretary to the Government of India. The work of the Commission is divided among 3 wings namely, Designs and Research Wing, River Management Wing and Water Planning and Projects Wing. Each wing is placed under the charge of a full-time Member with the status of Ex-Officio Additional Secretary to the Government of India and comprising of a number of organizations responsible for the disposal of tasks and duties falling within their assigned scope of functions.

River Management Wing⁴ is responsible for, collection, compilation, storage and retrieval of hydrological and hydro-meteorological data including water quality monitoring, formulation and issue of flood forecast⁵ on all major flood prone rivers and inflow forecasts for selected important reservoirs, providing guidance to States in technical matters on different aspects of river and flood management in the country and regulation of multipurpose reservoirs, river morphology studies, techno-economic appraisal of various flood management schemes received from the State Governments, providing advice to coastal states on issues related to coastal erosion problems including preparation of National Coastal Protection Project for Coastal Protection works, survey and investigation of water resources development projects in India and neighboring countries, monitoring of schemes under Centrally Sponsored Command Area Development Program, Accelerated Irrigation Benefit Program, Revival and Restoration of Water Bodies etc. through field units of Risk Management Wing and international co-operation with neighboring countries in the field of flood forecasting.

(3) Upper Yamuna River Board

Upper Yamuna River Board⁶ is a subordinate office of the Union Ministry of Water Resources, Government of India. A Memorandum of Understanding signed in 1994, amongst the party basin states, for the sharing of the waters of river Yamuna up to and including Okhala barrage provides for creation of the Board.

The mandate of the Board is to regulate the allocation of available flows amongst the beneficiary states and for monitoring the return flows; monitoring conserving and upgrading the quality of surface and ground water; maintaining hydro-meteorological data for the basin; Framing of rules and regulations for water accounting and determination of the shares of water for each State, keeping concurrent records of the flow of the Yamuna at all stations considered necessary by the Board, consideration/completion of the records and determination of the volume of water flowing in river Yamuna in a water year, overviewing plans for watershed management; monitoring and reviewing the progress of all projects; and other similar functions.

3.1.4 Key Policies, Laws and Regulations

(1) National Water Policy, 2002

It emphasizes an appropriate reorientation/re-organization of institutional structures and mechanisms to initiate a participatory approach to water resource management by involving beneficiaries and other

³ Website: <http://www.cwc.nic.in>

⁴ Website: <http://www.cwc.nic.in/main/webpages/m/welcome.html>

⁵ CWC Flood Forecasting Website: <http://www.india-water.com/ffs/index.htm>

⁶ Website: <http://uyrb.nic.in>

stakeholders in the project planning stage itself. It categorically states that appropriate river basin organizations should be established for the planned development and management of a river basin as a whole or sub-basins, wherever necessary. Special multi-disciplinary units should be set up to prepare comprehensive plans taking into account not only the needs of irrigation but also harmonizing various other water uses, so that the available water resources are determined and put to optimum use with reference to the existing agreements or awards of Tribunals under the relevant laws. The scope and powers of the river basin organizations shall be decided by the basin states themselves.

The policy states that there should be an integrated and multi-disciplinary approach to planning, formulation, clearance and implementation of projects, including catchment area treatment and management, environmental and ecological aspects, the rehabilitation of affected people and command area development. The drainage system should form an integral part of any irrigation project right from the planning stage.

Section 17.3 of the policy states that, 'While physical flood protection works like embankments and dykes will continue to be necessary, increased emphasis should be laid on non-structural measures such as flood forecasting and warning, flood plain zoning and flood proofing for the minimization of losses and to reduce the recurring expenditure on flood relief.'

However, the policy does not indicate how such participation and local water initiatives could be put into practice and is weak on conceptualization of community involvement and management.

(2) Flood Risk Assessment Guideline

Prescribed methods, for example, those suggested by the Ganga Flood Control Commission, for estimating extreme floods in the basins, for the purposes of project planning and design, are not always consistently adapted and applied.

The guidelines do not necessarily account for circumstances specific to the area, such as the flood runoff caused by extreme monsoon rains falling on snow-covered areas. Nor does it appear that any of the project developers have considered the combined probability of reservoir failure in a cascade of dams within a river basin. Thus both the methods of assessing the level and risk of floods and the application of these methods need improvement.⁷

The Guidelines as issued by the Centre need to be customized as per the needs of the hilly State. This is possibly the role of agencies such as the Disaster Mitigation and Management Centre.

Based on the description provided above, the table below focuses on a summary of key laws, policies and regulations.

(3) Water Policy of Uttarakhand, 2005 (Draft)

Given the national context, the draft state water policy of Uttarakhand in its vision statement declares water as a basic human right; emphasizes on the need for conservation and development of water resources to achieve developmental goals (sustainable agriculture development, harnessing potential hydropower and industrial development); and envisages the participation of all tiers of Government in management and use of water resource. The water allocation priorities in the state water policy are in sync with the National Water Policy 2002. However, the policy also states that the local self-government institutions could modify these priorities of water use as per actual needs. The draft water policy also asserts that priority shall be given to identification and rejuvenation of traditional water resources like Naula, Dhara, Guhls, Ponds, etc. in the state.

(4) Uttaranchal River Valley (Development and Management) Act, 2005⁸:

'Regulation of Rivers, in so far as Uttarakhand is concerned pre-dates its formation. One of the two major conditions for Union Ministry of Environment and Forests clearance given for Tehri Hydro

⁷ Website: <http://www.ppiaf.org/sites/ppiaf.org/files/publication/Gridlines-41-India%20River%20Basin%20-%20MHaney%20JPlummer.pdf>

⁸ Website: <http://www.lawsofindia.org/pdf/uttarakhand/2005/2005UK6.pdf>

Electric Project consisted of enactment of The Bhagirathi River Valley Development Authority Act⁹, which after formation of the State was re-notified as Uttaranchal River Valley (Development and Management) Act, thus covering all rivers and river-sheds, not just the Bhagirathi River valley'.¹⁰

The Act provides for the establishment and constitution of an Authority and executive Committee involving State Government Ministers, Secretaries of various Departments, and Technical Advisors from the field of Environment Management, Geology, Eco-panning, Integrated Energy, Planning, Social Sciences, Forest Ecology, Law and other as required.

The functions of the Authority, intra alia, include oversight of the 'formation and execution of development plans to achieve optimum utilization of natural resources for integrated and sustainable development of basin. The development plan shall include water resources, land use and development of agriculture, sector development and related matters'; 'setup and maintain water quality monitoring system and offer community facilities at various rural rehabilitation centers', 'setup and maintain disaster management cells/crisis groups, and disaster fund in the catchment area'.

The Authority has been, inter alia, given powers to call for information about any development scheme from an Agency executing it; to approve and disapprove any development scheme; define the various sectors into which the development schemes may be divided and indicate the manner in which each sector is proposed to be developed and the stages by which such development schemes be carried out.

(5) Hydropower Policy in Practice

Uttarakhand has total of 98 existing hydropower projects¹¹, with total installed capacity of close to 3,600 MW. There are different agencies: State, Central and Private, involved in proposing, sanctioning and executing these projects. At least eleven of these projects are in private sector with total capacity of over 503 MW. An additional 1,800 MW capacity is in Central sector.

As per the Union Ministry of New and Renewable Energy Sources, by March 2013, 98 small hydro schemes have been installed, in Uttarakhand, with total capacity of 170.82 MW.

Twenty-five projects with 2,376.3 MW capacities are under construction in Uttarakhand; 6 of them are large hydropower projects and rest 19 are small hydro projects. Of the 6 large hydropower projects, 3 are in private sector and 3 in central sector, none in state sector.

There are 83 Large Hydro Projects; 97 Small Hydro Projects; 17 Mini-micro Hydro Projects proposed for different river valleys in Uttarakhand. Uttarakhand government has plans to have total of 336 hydropower projects with total capacity of 27,189.56 MW. Largest number (122) of such projects is in Alaknanda basin, the largest capacity is proposed to be in Sharda basin at 1,2450.405 MW.¹²

⁹ Website: <http://ua.nic.in/brvda.uk.gov.in/pages/display/1-home>

¹⁰ Excerpt from Note by Dr. R.S Tolia, Former Chief Secretary, Uttarakhand

¹¹ For a comprehensive list of Hydro power projects in the State please refer to Website: http://sandrp.in/copy_of_Uttarakhand_Existing_under_construction_and_proposed_Hydropower_Projects_August2013.pdf

¹² Maps of Hydroelectric Projects in various sub basins of Uttarakhand are available at the following links. Please note that the maps are based on information available in 2011:

Website: http://sandrp.in/basin_maps/Hydropower_Projects_in_Ganga_Basin.pdf,

Website: http://sandrp.in/basin_maps/Bhagirathi%20150411.jpg,

Website: http://sandrp.in/basin_maps/Alaknanda%20150411.jpg,

Website: http://sandrp.in/basin_maps/Mandakini150411.jpg,

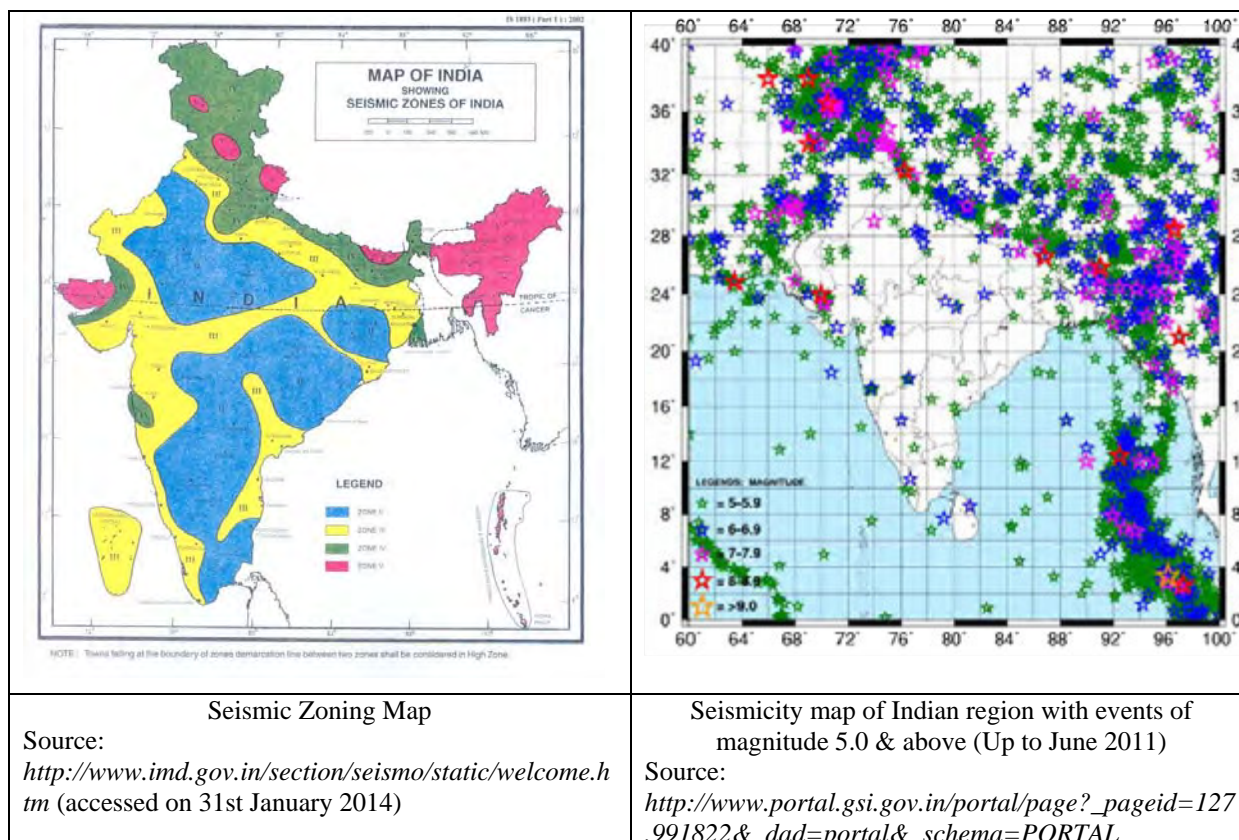
Website: http://sandrp.in/basin_maps/Goriganga150411.jpg,

Website: http://sandrp.in/basin_maps/Major_Hydro_Projects_in_Yamuna_Basin.pdf

3.2 Concrete Efforts by the Central Government

3.2.1 Earthquake

Earthquake monitoring is conducted by India meteorological department. And the analysis is also conducted by the Geological Survey in India.



Source by India Meteorological Department

Figure 3.2.1 Earthquake Monitoring and Seismic Distribution

3.2.2 Forecasting and Early Warning Systems

It is most essential to establish, upgrade and modernize the forecasting and early-warning systems for all types of disasters. The nodal agencies responsible for monitoring and carrying out surveillance, for specific natural disasters, will identify technological gaps and formulate projects for their upgradation, in a time bound manner.

All States should provide to India Meteorological Department the required infrastructure for upgradation/ establishment of meteorological observation systems. Partnership with the World Meteorological Organization (WMO), Pacific Tsunami Warning System and other regional and global institutions may also be considered. Information and Communication Technology (ICT) tools need to be used for data receptions, forecasting and timely dissemination.

The basic communications and Information Technology (IT) support requirements for disaster management correspond to the following three levels:

- 1) Decision makers and disaster managers at all levels.
- 2) Real time dissemination of advance warnings and information to the concerned authorities at various levels and threatened community. For dissemination of advance warning and information through broadcasting mediums such as television and radio shall be used

significantly as it has higher geographical reach. For coastal and hilly regions, network of meteorological department may be used.

- 3) Last mile connectivity at the disaster site for control and conduct of rescue and relief operations.

Communication and sharing of up-to-date information using state-of-the-art IT infrastructure remain at the heart of effective implementation of the disaster management strategy. Reliable, up-to-date and faster sharing of geo-spatial information acquired from the field or the affected areas is a prerequisite for effective implementation of disaster management strategies. Efforts should be made for setting up IT infrastructures consisting of required IT processes, architecture and skills for quick up-gradation and updation of data sets from the Panchayati Raj Institutions or the Urban Local Bodies. A National Emergency Communication Network, involving the contemporary space and terrestrial-based technologies in a highly synergistic configuration and with considerable redundancy, will be developed. This Network will ensure real time dissemination of warnings and information up to the affected community and local authorities.

3.2.3 Strengthening of the Emergency Operations Centres

The establishment of Emergency Operations Centres at the national, state, metros and district level and equipping them with the contemporary technologies and communication facilities and their periodic upgradation, will be accorded priority. For the last mile connectivity and control of the operations at the disaster hit areas, availability of portable platforms will be catered for. The integration of Ham radios and such other innovative facilities, into the DM communication system, will be advantageous.

Each state has a State Emergency Operation Centre (SEOC) or Control Room for Disaster Management established along with all the

State Emergency Operation Centre (SEOC) 1070 (Toll free) (code 0135 from outside Dehradun Phone No. 0135-2710334, Fax 0135-2710335).

3.3 Disaster Management Framework in Uttarakhand

3.3.1 Organization

(1) Department of Disaster Management and Disaster Mitigation and Management Centre

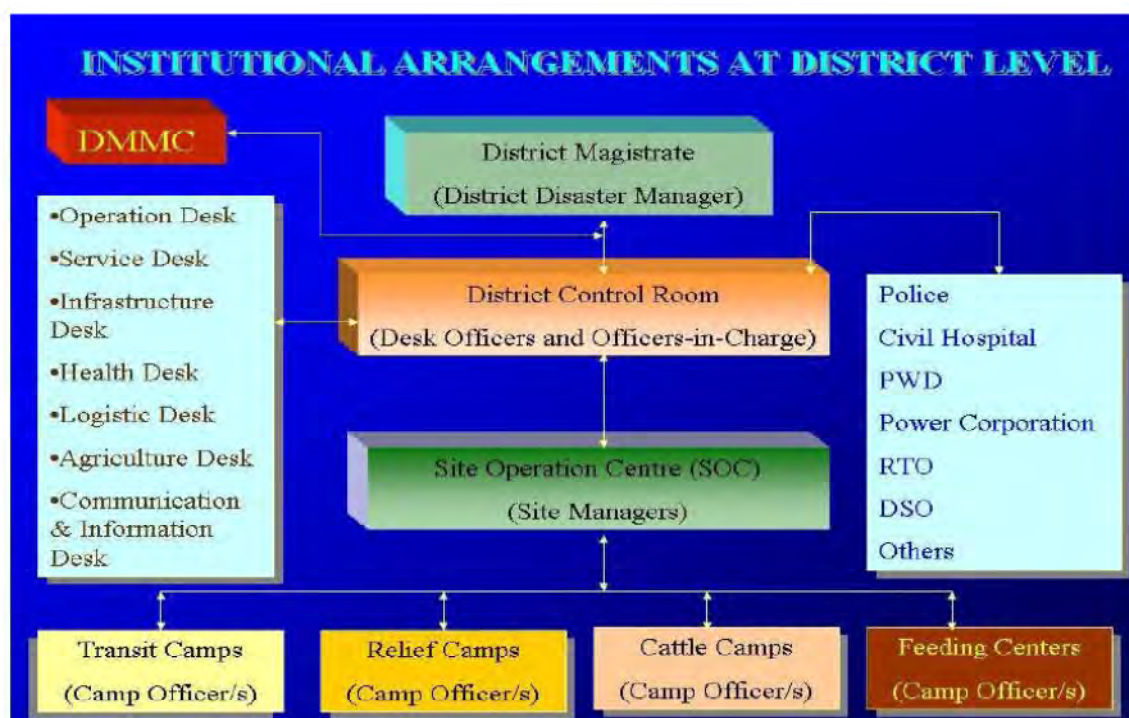
The Department of Disaster Management (formally known as State Disaster Management Authority) was created in Uttarakhand as an apex body for disaster management. However, the actual disaster management operations are undertaken by the Panchayat Raj Institutions at the field level.

Disaster Mitigation and Management Centre¹³ (DMMC) is an autonomous institute under aegis of Department of Disaster Management, Government of Uttarakhand. The mandate of DMMC is to work in the area of Disaster Risk Reduction, in the state, with the people and government authorities, in formulating appropriate plans, policies, standard operation procedures and strengthening their capabilities to cope up with all aspects of disaster management. DMMC is the technical center for DM in Uttarakhand, which gets certain support from the central government and donor agencies. The center is established for protection of the community and environment from the overwhelming obliteration caused by disasters. DMMC, located in the Uttarakhand secretariat compound, works for generating the sense of commitment amongst common people and government authorities in formulating appropriate policies and strengthening their capabilities to cope up with all aspects of disasters.

¹³ Website: <http://dmmc.uk.gov.in/pages/display/2-about-us>

Post June 2013 disaster, DMMC and the Department of Disaster Management has come in for a lot of criticism from the media and general population for its failure to rely an early warning in the state. The incident also showed limited capacities of the body.

The relationship between DMMC and each district is as shown below.



Source: page 62 in <http://chamoli.nic.in/pages/display/131-district-diasaster-management-action-plan> (n.d.)

Figure 3.3.1 Institutional Arrangement at District Level

(2) Public Works Department (PWD)

Public Works Department (PWD) is responsible for construction, maintenance and planning of roads, bridges and government buildings. In view of strategic location of Uttarakhand bordering China and Nepal, the responsibility of PWD becomes of much more important from the defense point of view as well. A portion of roads in Uttarakhand, especially the National Highways and State Highways in the hilly areas close to the international borders, is also being constructed and maintained by Border Road Organization (BRO). Some village roads are also constructed by the Rural Development Department (RDD) and maintained by the Panchayat Raj Institutions (PRIs) under certain centrally-sponsored schemes (CSS), such as Pradhan Mantri Gram Sadak Yojana (PMGSY).

Table 3.3.1 State-Wide Road Category and Length

	Category of Road	Road Length (2000)	Road Length (2012)
1	National Highway	526.00 km	1,375.76 km
2	State Highway	1,235.04 km	3,788.20 km
3	Major District Road	1,364.15 km	3,289.74 km
4	Other District Road	4,583.01 km	2,945.04 km
5	Village Road	7,446.23 km	14,543.89 km
6	Light Vehicle Road	315.77 km	858.22 km
7	Bridle Roads/Border Tracks	3,970.00 km	3,729.83 km

Source: Public Works Department, Uttarakhand

Total number of major bridges in state is more than 1,000. Various Buildings of other department are also constructed by the PWD as deposit work.

The setup of PWD includes one Chief Engineer Level 1 (Headquarters) responsible for monitoring and

managing the establishment of the department, one Chief Engineer Level 1 (Planning) responsible for planning, two zonal Chief Engineers Level 2 – one each at Pauri (for Garhwal region) and at Almora (for Kumaon region), one Chief Engineer Level 2 (National Highway) responsible for managing the network of National Highways in the state and one Chief Engineer Level 2 (ADB/IT) responsible for the Asian Development Bank funded Uttarakhand State Road Investment Program and Information Technology infrastructure in PWD.

PWD has implemented Uttarakhand State Roads Investment Program funded by ADB for the last several years.

There are 14 circles headed by Superintending Engineers and 72 divisions with Executive Engineers as head of office in addition to other supporting officers / staff spread out in the entire State.

The various road works are carried out as per the government specifications and standards.

(3) Boarder Road Organization (establishment of Government of India)

The Boarder Road Organization (BRO) is the largest single construction organization in the country today. It was established more than 50 years ago as an unarmed and non-combatant force integral to the Armed Forces with personnel both from the Army and the General Reserve Engineer Force (GREF). BRO provides close support in maintaining the vast road communication network, not only in the war zone, but also linking the logistic nodes of the Army in the rear to its forces in battle and works mostly in remote and often insurgent prone areas.

BRO is at present constructing approximately 15,000 km of roads. In addition, 20,071 km of roads including 3,760 km of National Highways are under maintenance by BRO. The annual budget of the BRO in 2010-11 was Rs. 56,200 million. To cope with the increased work load, the work is also being executed through contracts. In Uttarakhand, a part of National Highways and Major State Highways are constructed and maintained by BRO.

Over the years, BRO has transformed from a normal road construction agency to a multi-faceted, multi-dimensional, transnational, modern construction agency instrumental in constructing tunnels in addition to long span bridges airfields, National Highways etc. The BRO has diversified from road construction to construction of permanent bridges, airfields, major building projects and related civil works in the field of tunneling and hydro-electric projects.

Another major critical activity of the BRO is winter and summer snow clearance. This is carried out in high altitude/ snow bound areas to keep roads open for traffic during winter as well as open up those roads closed in winter, before the summer sets in. There are approximately 64 roads of a total length of 2,618 km in Uttarakhand, J&K, Himachal Pradesh, Sikkim and Arunachal Pradesh, where the BRO carries out snow clearance. This is essential, not only to ensure the provision of logistic support for the Army, but also to provide road connectivity to the local population in these far flung areas. BRO also works for clearance of roads during the disasters.

(4) Uttarakhand Rural Development Department (RDD)

Uttarakhand Rural Development Department (RDD) implements a flagship program of GoI, namely Pradhan Mantri Gram Sadak Yojana (PMGSY). The program started in 2000 with the financial assistance of the World Bank, and the primary objective of the PMGSY is to provide connectivity, by way of an All-weather Road (with necessary culverts and cross-drainage structures to the eligible unconnected habitations in the rural areas with a population of 500 persons and above in Plain areas. In respect of the Hill States (North-East, Sikkim, Himachal Pradesh, Jammu & Kashmir and Uttarakhand), the Desert Areas (as identified in the Desert Development Program), the Tribal (Schedule V) areas and Selected Tribal and Backward Districts (as identified by the Ministry of Home Affairs and Planning Commission), the objective would be to connect eligible unconnected Habitations with a population of 250 persons and above.

The PMGSY will permit the upgradation (to prescribed standards) of the existing roads in those Districts, where all the eligible habitations of the designated population size have been provided all-weather road connectivity. However, it must be noted that upgradation is not central to the program.

In upgradation works, priority should be given to through routes of the rural core network, which carry more traffic.

(5) Uttarakhand Irrigation Department

The Uttarakhand Irrigation Department is the agency responsible for river training in the state. It is involved in the construction and maintenance of irrigation channels and tube wells and runs a number of Hydro Power Projects. In addition, it is also involved in flood protection and drainage works, including anti-erosion works of rivers and riverbeds.¹⁴

To support irrigation, the department has constructed and is managing 2,740 canals (small and big), 1248 tube wells and 166 lift canals. The department has also constructed 891 flood protection walls with a length of 394 km. Simultaneously it also manages 9 lakes and 2 barrages. The total command area under irrigation is 333,800 ha.

In addition, the irrigation department has undertaken avalanche resistant work in Badrinath; soil erosion works in Kedarnath and Gangotri.¹⁵ The department is the largest body for civic works in the state when it comes to river training.

The Department of Irrigation submits proposals to the Ganga Flood Control Commission, which after vetting and approving further submits it to the Ministry of Water Resources, Government of India. Since Uttarakhand is a special category state, the money from Government of India is in the nature of 90% grant. 10% of the costs need to be borne by the state government.

(6) Watershed Management Directorate

The Watershed Development Directorate¹⁶ (WMD) has been established as a nodal agency for coordination, monitoring and implementation of integrated watershed management programs in the state. With this objective in mind the State Level Nodal Agency has been formulated according to the Common Guidelines for watershed development project 2008 and has been anchored with WMD.

WMD has the mandate and expertise to prepare watershed-based projects and has a repository of watershed related information. A total of 8 watersheds, 116 sub watersheds and 1110 Micro Watersheds have been identified in the state which are being taken up for regeneration and sustainable development, in a phased manner. In the state, thrust has been given to Integrated Watershed Development Programs¹⁷.

(7) Uttarakhand Jal Vidyut Nigam Limited

Uttarakhand Jal Vidyut Nigam Limited¹⁸ (UJVNL) is a wholly owned Corporation of the Government of Uttarakhand set up for managing hydro power generation at existing power stations and development, promotions of new hydro projects¹⁹ with the purpose of harnessing, the known, and yet to be known, hydro power resources of the State. UJVNL operates hydropower plants ranging in capacity from 0.2 MW to 376 MW, totaling up to 1306 MW. In Uttarakhand, the Uttarakhand Jal Vidyut Nigam Limited is associated with the Upper Yamuna River Board._

(8) Uttarakhand Renewable Energy Development Agency

In Uttarakhand, operation and execution of various schemes based on non - conventional energy resources is handled by Uttarakhand Renewable Energy Development Agency²⁰ (UREDA) through local Panchayat, volunteer organizations and district administration.

UREDA is constructing Micro & Mini Hydro Projects²¹(MHPs) for remote village electrification as well as for grid feeding. So far 44 MHPs of composite capacity 4.29 MW have been commissioned

¹⁴ Website: <http://www.uttarakhandirrigation.com/fabrication.html>

¹⁵ Website: http://www.uttarakhandirrigation.com/flood_protection.html

¹⁶ Website: <http://gramya.in>

¹⁷ Website: <http://www.iwmp-uttarakhand.in>

¹⁸ Website: <http://www.uttarakhandjalvidyut.com>

¹⁹ List of Hydro Project being developed by UJVNL Website: <http://uttarakhandjalvidyut.com/bd2.pdf>

²⁰ Website: <http://ureda.uk.gov.in>

and more than 300 Villages & Hamlets have been electrified through these projects. Earlier the projects were constructing on turnkey basis but from year 2005, Govt. of Uttarakhand has decided to construct MHPs for village electrification on community participation.

For construction of MHPs, tripartite Agreements have been signed between UREDA, Alternate Hydro Energy Center (AHEC), Indian Institute of Technology (IIT) - Roorkee and Concern User Energy Committee (UEC). As per the Agreement AHEC and IIT- Roorkee are providing technical services for construction of MHPs; and UREDA is monitoring, funding and providing guidance to UECs. MHPs are being constructed with the financial support from Ministry of New and Renewable Energy Govt. of India.

(9) Uttarakhand Forest Department

Forest Department in Uttarakhand²² is responsible for managing some of the richest forests and biodiversity in India. It is also involved in the following aspects of River Training and Management:

Catchment Area Treatment plans (CAT): The Forest Department is also implementing CAT plans in the areas forming catchment areas of the various Micro Hydro Projects which are under construction on various rivers of the State. These CAT plans are a part of the Compensatory Afforestation Plan of the various Land transfer proposals for these Micro Hydro Projects. These plans are mainly being implemented in the forests areas of the catchments concerned. The major works being carried out are Drainage Line Treatment, Afforestation, Soil and Moisture Conservation Works.

Ram Ganga River Valley Project (RVP) and Flood Prone Area Project (FPAP) are the schemes being implemented by the State Forest Department. The Union Ministry of Agriculture sponsors them in macro mode. Ram Ganga Valley project was started in the year 1962. The main aim of the scheme was to protect the Dam constructed on the Ram Ganga River near Kalagarh from excessive siltation and to increase the life of the reservoir. The main works under the scheme are afforestation; pasture development treatment of the arable land, plantation of horticulture tree species, Drainage Line Treatment and Soil and Moisture Conservation works.²³

Flood Prone Area Project is being implemented since 1981. Under the scheme the Upper Ganga and Upper Yamuna basin, above Tajewala, has been taken up for treatment of Flood Prone areas. In this scheme plantation, soil and moisture conservation works, Drainage Line Treatment, Agro Forestry and Afforestation are the major works being carried out.

(10) Uttarakhand Environment Protection and Pollution Control Board

Uttarakhand Environment Protection and Pollution Control Board²⁴ (UEPPCB) is a statutory Organization constituted under the section 4 of Water (Prevention and Control of Pollution) Act, 1974 to implement Environmental laws and rules within the jurisdiction of Uttarakhand.

The UEPPCB came into existence in 2002 and functions through its Head Office at Dehradun along with its 4 Regional Offices, Dehradun, Roorkee, Haldwani & Kashipur. UEPPCB has a mandate is to 'strike a rational balance between economic growth and environmental conservation'. The Board has been entrusted with the powers and functions under the Water (Prevention and Control of Pollution) Act 1974. Subsequently the implementation of Water (Prevention and Control of Pollution) Cess Act, 1977; Air (Prevention and Control Of Pollution) Act, 1981; Environment Protection Act (1986) and the Public Liability Insurance Act, 1991 was also entrusted to the State Board.

The role UEPPCB is limited when it comes to inspection of environmental impact of masonry river training, but can be potentially exercised in the case of river basin management.

²¹ Website: <http://ureda.uk.gov.in/pages/display/131-micro-hydro-projects>

²² Website: <http://www.uttarakhandforest.org>

²³ *Infra* 1, P. 83

²⁴ Website: <http://ueppcb.uk.gov.in>

(11) Uttarakhand Space Application Centre

Uttarakhand Space Application Centre²⁵ (USAC) was commissioned by Government of Uttarakhand, which works closely with the Indian Space Research Organization (ISRO) and its affiliate institutions as Space Application Centre (SAC) and National Remote Sensing Centre (NRSC). USAC is an autonomous organization of Department of Science and Technology in 2005. Besides being notified as nodal point for creation of the State Natural Resources Management Centre, the center acts as the hub for data repository for all primary and derived layers based on digital interpretation of remote sensing data, vectorization and interpretation of other ancillary data.

USAC is mandated to provide scientific and technical support to the user departments in their programs and activities. The center is supposed to carry out its programs in active collaboration with line departments to create a decision support system for developmental planning. This would include forest resource management, water resources, agriculture and horticulture, developmental communications in the form of telemedicine and tele-education, disaster forewarning system, rural development through micro-watershed development programmes and several other programs.

3.3.2 State Disaster Management Plan

Disaster Management Plan in Uttarakhand state and District is as shown in Table below.

Table 3.3.2 Existing Plan and Manual for Disaster Management

Plan		Status	Individual Plan
State	Disaster Mitigation and Management Center (DMMC)	Draft in preparation (unapproved)	None
Districts	Chamoli, Haridwar, Udham Singh Nagar, Champawat, Dehradun, Uttarkashi, Bageswar, Almora, Nainital	Approved	Almora District: DDMP 2013-14 for Landslides

Source: DMMC, Government of Uttarakhand

As shown, the State Plan is yet to be approved. 9 districts out of 13 have already drawn up the disaster management plan.

3.3.3 Concrete Effort by the State Government

(1) Early Warning Systems

The State of Uttarakhand has been putting its effort to establish early warning systems, focusing on the followings aspects:

- i) Establish coordination with the local technical agencies responsible for forecasting different hazards,
- ii) Establish a reliable communication system (Telephones, Radio Communication etc.) from technical agencies to the State Emergency Operating Centre (SEOC) and to Provincial / District Control Rooms directly or through (DEOC). Ensure redundancy by having alternative communication systems in place in case of breakdowns in the main system.
- iii) Have the system established with media and ensure dissemination of information through same.

The Disaster Mitigation and Management Centre (DMMC) is the key focal point responsible for coordinating early warning, along with the relevant technical agencies and Technical Committees, its dissemination and for ensuring last mile dissemination of same. The State Emergency Operation Centre of the DMMC will be in constant coordination with all technical agencies responsible for

²⁵ Website: <http://www.u-sac.in/index.html>

natural and man-made hazards, and in instances of any imminent disaster, it will take action to inform the responsible officers for onward communication to the sub-levels and communities.

DMMC also creates awareness among communities and all concerned including police on the communication system in use for early warning and what immediate actions to be taken, especially on rapid onset disasters.

In the case of a natural calamity/ incident, the preliminary information is received from the police wireless sets. Immediately after the initial action taken report is prepared based on wireless/ telecommunication opinion, it will be sent to all the concerned officers including Honorable Chief Minister, Secretaries, Information Directorate, Commissioners, Departmental Nodal Officers, Ministry of Home Affairs, NIDM, Geological Survey of India (GSI), and Media also.

The state also developed the Alert and Information System (SMS Software). It is an effective tool during the incident. This system plays a vital role in dissemination of information with respect to incident in detail; it includes the following format of reporting:

- Type of incident - road accident/ natural calamity/ earthquake
- Place of occurrence/ Block/ Tehsil/ District
- Time and date of occurrence
- Total persons affected, expected casualties, persons injured/ seriously injured

In some cases, dissemination of detailed information on the incidence is done through SMS. All messages are communicated to print media and electronic media.

DMMC also has a well-established, adequately equipped GIS laboratory supported by the donor agency and central government.

Database on the various critical infrastructure is an important resource for quick decision making so as to better manage the disaster situation. DMMC has prepared a detailed database of all critical resources for the entire state of Uttarakhand under the GIS environment. DMMC is utilising the satellite data for preparing input theme maps into the GIS environment. The following layers are presently available with DMMC for the entire state:

- a) Drainage
- b) Habitation
- c) Roads
- d) Irrigation
- e) Health infrastructure
- f) Police and Revenue Police infrastructure
- g) Wireless communication facilities
- h) FCI [Forest Cooperation of India] godowns
- i) Landslide hazard map

(<http://dmmc.uk.gov.in/pages/display/78-g.i.s.-database>).



Figure 3.3.2 Landslide Map and Landslide Hazard Map

(2) Emergency Contact Numbers:

Emergency contact numbers in the state are as below: State Emergency Operation Centre (SEOC) 1070 (Toll free) (code 0135 from outside Dehradun Phone No. 0135-2710334 , Fax 0135-2710335; and District Emergency Operation Centre (DEOC) 1077 (Toll free) (Callers from outside district: dial code of district and then toll free number).

(3) Communication

Effective communication is a must for effective management of the disaster situation and therefore DMMC is emphasizing upon strengthening normal communication network as also erecting alternative backup communication infrastructure DMMC has police wireless connectivity at State Emergency Operation Centre, video conferencing facility with all the 13 districts and 22 state headquarters and MHA. Satellite phones have been set up in ten districts as also in the DMMC and SEOC for providing alternative communication. DMMC is currently using SMS gateway service for emergency alerts. A HAM radio club has been formed in DMMC for providing alternative communication as also for promoting this hobby.

(4) Value Added Services

DMMC is providing various advisory technical inputs to the various state government departments. DMMC has completed the projects for demarcating landslide prone areas in the reservoir rim of Tehri dam and Road Master Plan of Uttarakhand, GIS based health infrastructure mapping, besides preparing district disaster management plans for the downstream districts of Tehri dam. (Source: <http://dmmc.uk.gov.in/pages/display/80-communication>)

The State Government had yet to frame the guidelines, policies and rules as envisaged in the Disaster Management Act, 2005. Further, the State Disaster Management Authority was virtually non-functional since its inception in October 2007. The State Disaster Management Authority

formed in October 2007 was virtually non-functional as it met only once (January 2008). (Source: <http://agua.cag.gov.in/upload/contents/File-2.pdf>)

Government of Uttarakhand has initiated a website for relief and rescue operation in the affected areas of the state. Where list of missing persons, list of persons admitted into the hospital and the details, Appeal from the Government to the people, the government circulars, online contributors/ donations received etc., control room telephone numbers, etc. under the Uttarakhand Disaster Management and Rescue Centre, Uttarakhand Secretariat, Dehradun. (Source: <http://dms.uk.gov.in/>)

At the time of the Survey, the Government of Uttarakhand was assessing/ calculating the actual damage/ loss due to recent disasters from the field level data collected from each village coordinating with the respective departments. The Revenue Department personnel have conducted the survey and finalization of report of entire damage assessment, compensation will be disbursed as per the data. The Government of Uttarakhand has been involved in the emergency relief and recovery operations.

Chapter 4 RESPONSE TO RECENT DISASTER

4.1 Rescue and Emergency Relief

The Army, Air Force, Indo-Tibetan Border Police (ITBP), National Disaster Response Force (NDRF), Border Roads Organization (BRO) Public Works Department and local administration worked together for quick rescue operations. Several thousand personnel were deployed for the rescue missions. Activists from political and social organizations were also involved in the rescue and management of relief centres. The national highways and other important roads were closed to regular traffic. Helicopters and various other modes of transport were used to rescue people, but due to the rough terrain, heavy fog and rainfall, maneuvering them was a challenge. About 150,000 pilgrims, tourists and 40-50 thousands local residents trapped in the valleys were rescued.

On 25 June, 2013 one Indian Air Force (Mi-17V5) rescue helicopters returning from Kedarnath, carrying 5 Air Force, 9 NDRF, and 6 ITBP officers crashed on a mountainous slope near Gauri Kund, killing all on board.

The Government of India has immediately allotted INR 200 billion for rebuilding the state and that can be utilized for disaster management purposes. (Source: <http://nidm.gov.in/default.asp> NIDM workshop on lessons learnt uk-13)

NGOs have started working in the relief distribution in the affected areas through the district administration. These NGOs are planning for rehabilitation and reconstruction work as per the government rules and regulations which will vary from time to time.

4.1.1 Damage Assessment by Donors

There are many agencies working on damage assessment in the aftermath of the recent disasters in the state of Uttarakhand including the World Bank, Asian Development Bank, UN Team for Damage Assessment, Sphere India network, Save the Children and many more organizations at local level also.

The World Bank (WB) and ADB jointly undertook the disaster damage assessment through a team of more than 20 consultants. The report has been prepared, and the State Government is scrutinizing. During the assessment, the team was unable to access the disaster-affected areas or collect primary data/ information. The assessment, therefore, is done based on the existing data and information provided by the concerned authorities.

4.2 Assistance from the World Bank

WB pledged USD 150 million from its regular financial facility, and another USD 100 million may be provided from its regular program, though the plan for the regular program portion may change later on. WB has a “guideline for situation of urgent needs”, which has been applied to this project. That is the reason that the project formulation process is moving faster than usual, though there has been criticism that the WB is moving too slow, compared to ADB.

The Project Document (PD) was prepared by the State Government, and the WB was scrutinizing it. Overall, the original PD lacks critical details in a great extent, and WB requested the State Government to provide additional information and details. In other words, there was no concrete plan for project implementation that has been accepted by WB, and the timeframe for the preparatory works is indefinite. The Project Document (PD) was at the final stage of finalization process, and the negotiation with the Government of India (GOI) was scheduled in early October 2013. Based on the negotiation, the PD will be finalized and expected to be approved shortly .

WB will focus on 5 areas: 1) Rural roads (ADB is in charge of main roads/ highways, 2) Study/ planning, 3) Shelters/ housing, 4) Public offices and facilities, and 5) Capacity building State Disaster

Response Force (SDRF), while ADB will focus on 1) Main roads/ highways, 2) Tourism infrastructures, 3) Heliports and 4) Water facilities (**Attachment 4.2.1**).

For the rehabilitation of rural roads, WB has already been implementing a rural road development project (PMGSY) in Uttarakhand before the disaster. The new project will cover the rehabilitation of damaged roads, which were not covered by PMGYS. The project will cover mainly the 5 most affected districts (Bageshwar, Chamoli, Pithoragarh, Rudraprayag and Uttarkashi districts), and may cover other districts which were affected by the disaster. No specific target sites/ routes have been indicated by the government, and total work quantities with basis are still unclear. WB has committed USD 65 million for this component and requested the State Government to submit detailed plan shortly.

Even though WB pledged the financial assistance, it has given certain conditions for implementation, such as securing environmental clearance, securing available land for construction, etc. The Bank also specified that the road alignments must be done by the State Government using the government fund.

A study would be undertaken through the support of WB once the detailed plan is submitted for road rehabilitation. The study would include the geological survey, geotechnical survey, study on alternative technologies to alleviate the use of dynamites for construction, etc.

WB is largely concerned by the capability of State Government to handle large funds inflow. In addition to the financial assistance from the donor agencies, the GoI has committed to provide the State with large amount of financial assistance, much larger than the WB assistance. How much workloads the State Government can take is uncertain. For example, the Public Works Department (PWD) is already overburdened with massive emergency and recovery works, and their response to the WB's request to submit necessary information and documents is very slow due to the excessive workload. WB plans to undertake a quick implementation capacity assessment, but it has been hindered because the State Government has not yet specified to the WB which agencies will undertake which works.

For the rehabilitation of shelters/ housings, WB committed USD 25 million for the construction of 2,000-3,000 houses in 700 clusters in 5 districts. However, the State is proposing to build temporary shelters, and WB would only agree on permanent housings. WB gave rigid conditions to the State Government, as the beneficiaries must have their own lands. For this, certain government lands must be converted into private lands and distributed to individual beneficiaries/ victims. WB set a deadline for this work to be completed by the end of October 2013, which would be difficult to meet because it requires a number of clearances. Also, WB made a condition that if the victims will resettle at new resettlement areas, the basic infrastructure and livelihood must be ensured for the re-settlers by the State Government. ADB would assist the construction of drinking water facilities, and WB would support the rural roads. But other infrastructure must be developed by the State Government using its own fund. As PWD is overburdened by many works, the housing component may be implemented by the State Disaster Management Authority. But the interviewee believes that it would be very difficult because SDMA may not have technical expertise and other capabilities to undertake such works.

For the rehabilitation of damaged public buildings, the project would cover Gram Panchayat office buildings, village healthcare centers, Anganwadi centers, Community Development Block office buildings, etc. This work would be undertaken by PWD.

The project will have a very strong capacity building component as the WB finds that the technical expertise of concerned agencies was very weak relating to disaster risk management in the state. The capacity building of SDRF has been identified as one of the important areas but has been a low priority because there are many other urgent needs. The National Disaster Response Force (NDRF) has been established for years, and SDRF would be established and strengthened through the support of NDRF.

Remote sensing, weather forecasting and other "soft" components would be supported by WB, although the detailed plan that is yet to be finalized. The WB will also support the slope stabilization and other geo- and hydro-morphologic interventions and technologies necessary for the infrastructure protection (especially the roads) from disasters. WB will also support the development/ improvement

of early warning system, especially with regards to the utilization of remote sensing technologies by the State Space Application Centre. The project will also support the strengthening of Meteorological Department for weather forecasting by providing more weather stations and introduction of advanced technologies for forecasting.

After the approval of PD, the project will start immediately. The expenditures incurred since June 2013 will be paid by the project retroactively, so the project has already started in that sense.

4.3 Assistance from Asian Development Bank

Asian Development Bank (ADB) have pledged USD 10 million for repair/reconstruction of bridge paths which connect remote villages. ADB will focus on 1) Main roads/ highways, 2) Tourism infrastructures, 3) Heliports and 4) Water facilities. For the roads, ADB has provided funding for repair/reconstruction of some state highways and major district roads, where the WB will not finance.

DPR will be made in a staggered manner for particular routes and locations to expedite the funding procedures. ADB has already sent a Fact Finding Mission and drafted Aide Memoire which has to be finalized by 13th September, 2013. DPRs are being made and consultants are being hired. The loan agreement would be signed by October 2013. The loan would become effective from 1st January, 2014. ADB will retroactively reimburse the expenditures that occurred after June 14, 2013.

This is an emergency loan which is being speedily processed by ADB and attractive finance terms are being given. The process is further expedited because ADB has been working in the road sector in the state for years and knows the roads in the states through consultants and engineers. This also applies to the World Bank.

4.4 Assistance from GoI

Ministry of Roads, Transport and Highway, GOI decided that a funding of Rs. 10,000 million will be made available for the repair/reconstruction of Border Roads and part of state highways by the ministry. The Border Road Organization (BRO) is repairing the national highways and other security-related roads under the control of the central government, while the state government is in charge of all other roads.

4.5 Other Supports

(1) United Nations Disaster Management Team (UNDMT) India

UNDMT team is coordinating with the Government on distribution of relief and rescue works in the affected districts. They will continue to support the affected districts authorities to prepare their reconstruction plans and getting resources for implementation.

(2) Save the Children

Save the Children will work on the child protection from wide spread psycho-social distress, lack of birth registration certificates, community based child protection systems, children without appropriate care. It will also support the health and nutrition sector and education sector, as the construction of alternate schools, rehabilitation of unsafe or damaged schools, Anganwadi centers, disaster impacts on school attendance and child labor. It will also support the re-issuance of lost education certificates and school records, reduction of corporal punishment after disaster.

(3) NGO Interagency Network

During the emergency relief works, an NGO interagency network was established to improve the effectiveness and efficiency of relief works by a large number of organizations and agencies. The network may decide to continue operating the recovery works also.

(4) British High Commission

Though no concrete plan has been prepared, but the Government of United Kingdom may extend its support for the rehabilitation of disaster damages.

Chapter 5 ISSUE OF DISASTER RISK MANAGEMENT

5.1 Current Issue regarding Risk Management Plan

The national disaster management plan has been already drawn by National Disaster Management Authority (NDMA), and some districts in Uttarakhand have prepared their district disaster management plans. However, the state disaster management plan is yet to be finalized and approved.

Also, after reviewing a few district plans, it was felt that appropriate risk management measures and considerations have not been taken care of under by the existing plans.

5.2 Implementation of Plans and Performance

The Comptroller and Auditor General (CAG) of India had undertaken a performance audit in 2013 (before the recent disaster in Uttarakhand) to assess the disaster preparedness of the country. The report by CAG illustrates its critical analysis of the situation and points out key issues as summarized in the table below:

Table 5.2.1 Key Observation of the Comptroller and Auditor General of India on Disaster Preparedness

Key issues	Assessment provided by the auditor	Reference
Planning of Disaster Preparedness	“The National Plan for Disaster Management had not been formulated even after six years of the enactment of the Disaster Management Act.”	Paragraph 3.1.1
	“There were no provisions to make the National Guidelines issued by National Disaster Management Authority, binding on states in preparation of the state plans.”	Paragraph 3.2
	“There were significant deviations from the prescribed roles and practice of Ministry of Home Affairs, National Executive committee and National disaster Management Authority.”	Paragraph 3.4
National Disaster Management Authority	“There was no Advisory Committee of NDMA, since June 2010.”	Paragraph 4.2
	“None of the major projects taken up by NDMA was completed. Due to improper planning either the projects were abandoned midway or were still incomplete after lapse of a considerable period.”	Paragraph 4.3
	“NDMA was not performing several functions as prescribed in the DM Act. These included recommending provision of funds for the purpose of mitigation and recommending relief in repayment of loans or for grant of fresh loans.”	Paragraph 4.4.2
	“NDMA had not started the work of systematic assessment of major national projects, to include structural requirements for disaster reduction.”	Paragraph 4.4.3
	“Several critical posts in NDMA were vacant and consultants were used for day to day working.”	Paragraph 4.4.3
Resources/ Funds	“There were delays and mismanagement in respect of State Disaster Response Fund (SDRF) in states. The states were not regular in sending the details of utilization and unspent balances under SDRF to MHA. States did not invest the unspent balances under SDRF as per guidelines. This resulted in potential loss of interest of [Rs.] 477.99 crore in test checked states.”	Paragraph 5.1
	“National Disaster Response Fund was utilized for various purposes other than those stated in the GOI guidelines. ‘On account’ releases of [Rs.] 654.04 crore in case of Gujarat, Assam and Goa, from NCCF (now NDRF) were lying unspent with these states.”	Paragraph 5.2
	“National Disaster Mitigation Fund was yet to be established. Most of the states had also not established state and district level Disaster Mitigation funds.”	Paragraph 5.3

Key issues	Assessment provided by the auditor	Reference
	“Due to delays by NDMA in finalizing the guidelines, National Disaster Response Reserve for maintaining inventory of items required for immediate relief after disasters was not operationalised.”	Paragraph 5.4
Communication System for Disaster Preparedness	“National Database for Emergency Management which was to be completed by August 2011, was yet to be operationalised.”	Paragraph 6.1.1
	“Investment of [Rs] 23.75 crore was made in procurement and operationalisation of ALTM Digital Camera since April 2003. However, less than 10 per cent of the flood prone areas of the country was covered to generate close contour and detailed topographic information.”	Paragraph 6.1.2
	“Support through Synthetic Aperture Radar by acquiring area radar data during national disasters could not materialize even after six years from the scheduled date of completion. The expenditure incurred so far was [Rs.] 28.99 crore. “	Paragraph 6.1.3
	“The satellite based Communication Network was not fully operational after more than six years of receipt of the communication equipment.”	Paragraph 6.1.4
	“The Doppler Weather Radars for surveillance and monitoring of severe weather system could not fructify after spending [Rs.] 35.64 crore.”	Paragraph 6.1.5
	“National Disaster Communication Network and National Disaster Management informatics System projects of NDMA were still at the planning stage after several years of conceptualization.”	Paragraph 6.2
Capacity Building for Disaster Preparedness	“The schemes for ensuring seismically safer habitats by training of practicing architects and engineers failed to achieve its targets. The schemes were shelved without analyzing the reasons for its failure.”	Paragraph 8.1.3.1
	“The scheme for extending financial assistance to the ATIs ended with huge shortfalls.”	Paragraph 8.1.3.2
	“India Disaster Resource Network project to build up organized information system of specialist equipment and expertise for disaster response was operational only on ad-hoc basis.”	Paragraph 8.1.4
	“Non filling up of critical posts at National Institute of Disaster Management had hampered the coverage of training programmes.”	Paragraph 8.1.6.2

Source: Source: Report of the Comptroller and Auditor General of India on Performance Audit of Disaster Preparedness in India, Report No.5 of 2013

(http://www.downtoearth.org.in/themes/DTE/images/cag-report_20130625.pdf), Excerpts prepared by JICA Preparatory Survey Team

Similarly, CAG undertook audit in the State of Uttarakhand and prepared “Report of the Comptroller and Auditor General of India for the Year Ended 31 March 2010: Report No.2 Government Uttarakhand (<http://agua.cag.gov.in/upload/contents/File-2.pdf>). The report touches on the Performance Reviews of Department of Disaster Management and illustrates its observations and issues regarding the disaster management in the state as summarized in the table below:

Table 5.2.2 Key Observations the Comptroller and Auditor General of India on Performance Reviews of Uttarakhand Department of Disaster Management

Assessment provided by the auditor	Reference
“The State Disaster Management Authority formed in October 2007 was virtually non-functional as it met only once (January 2008). The State Government also failed to ensure incorporation of disaster prevention into the development process as envisaged in the act.”	P.1 [Paragraph 1.1.6.2&1.1.8.1]
“In absence of critical infrastructure such as trauma centre, the affected population could not be given immediate medical attention.”	P.1 [Paragraph 1.1.8.5]
“Assessment of structural and non-structural safety of school buildings and identification of necessary mitigative action was not included in the school. Safety programme, leaving 39 per cent of school buildings unattended.”	P.1 [Paragraph 1.1.8.6]
“Reliable communication system was inadequate as the delay in sharing of disaster information ranged from one to more than 24 hours.	P.1 [Paragraph 1.1.9.3]

Assessment provided by the auditor	Reference
“Despite incurring an expenditure of [Rs] 22.55 crore, the construction works were incomplete for want of release of second installment. Restoration works undertaken under the CRF scheme were delayed by 12 to 24 months since the occurrence of disaster.”	P.1 [Paragraph 1.1.10.3&1.1.10.4]
“[Rs.] 41.77 crore was sanctioned from CRF for inadmissible construction works in violation of norms of the scheme.”	P.1 [Paragraph 1.1.10.5]
“In absence of Rehabilitation & Resettlement policy, 80 identified villages of selected districts could not be rehabilitated.”	P.1 [Paragraph 1.1.10.8]
As mentioned in paragraph 1.1.6.1 above, although the State Government had not framed its own State specific policy for disaster management as required by the DM Act, most of the important features of the DM Act were covered in the first meeting (January 2008) of SDMA. The status of implementation in respect of other important features of the Act, however, left much to be desired as discussed below:	P.9 [Paragraph 1.1.8 & 1.1.8.1]
The DM Act envisaged that each department of the State Government which had a role in prevention/mitigation should (i) take necessary measures for prevention of disaster, mitigation, preparedness and capacity-building in accordance with the guidelines laid down by the SDMA, (ii) integrate into its development plans and projects the measures for prevention of disaster and mitigation and (iii) allocate funds for prevention of disaster, mitigation, capacity-building and preparedness. Scrutiny revealed that none of the departments had taken any specific measures for prevention, mitigation and preparedness in their development plans and projects. Further, no funds were allocated for the same by any of the State departments and instead, they remained dependent on CRF which was confirmed by all the line departments audited including department of disaster management. Thus, the State Government could not ensure incorporation of disaster prevention measures into the development process.	

Source: “Report of the Comptroller and Auditor General of India for the Year Ended 31 March 2010: Report No.2 Government Uttarakhand (<http://agua.cag.gov.in/upload/contents/File-2.pdf>) Excerpts prepared by JICA Preparatory Survey Team

The observations and analysis are quite critical, and summarize the key problems of disaster management in the state.

5.3 Technical Issue

5.3.1 Technical Manual

The Uttarakhand Soil Conservation Department has been converted into Watershed Management Directorate and Agriculture Department. It produced a technical manual for soil and water conservation, and the table of contents was translated into English from Hindi by the JICA Survey Team as shown below:

Subjects	Page No.
Background	
Chapter -1 : Water and Soil Conservation Field Manual	1
1.1 Objectives	1
Chapter-2: Water Source and its conservation	2
2.1 Source of water	2
2.2 Effects of water source in Hydrological cycle	3
2.3 Sources of water contamination	4
Chapter -3: Water and soil conservation measures	5
3.1 Safety steps	5
3.2 Progressive works	6
3.2.1 Vegetative measures	6
3.2.2 Technological measures	9
Chapter-4: conservation of water sources	41
Treatment of dried natural water sources	41
4.1 Construction of Polythene tank	42
4.1.1 Construction of continuous Contour trenches	42
4.1.2 Construction of trenches	42
4.1.3 Gully plugging	43
4.1.4 Masonry check dams	43
4.2 Construction of	43
4.3 Series of gully control structures	44
4.4 Roof top rain water harvesting	45
4.5 Ground water recharge	45
4.6 Calculation of velocity and quantity of water	45
Chapter-5: Sample format for calculating the water sources and	50
List of plants as per the geographic locations	55

Source: Uttarakhand Soil Conservation Department translated by JICA Preparatory Survey Team

**Figure 5.3.1 Table of Contents of the Technical Manual on Soil and Water Conservation
Uttarakhand Soil Conservation Department**

First of all, the manual is too brief. It should provide a complete detailed technical guidelines, design procedures, basis for cost estimation, etc. for the soil and water conservation works, and a 55 page document seems to be inadequate. Also the countermeasures included in the manual appeared to be quite limited. It also appeared that the manual is outdated and requires updation so that new technologies can be included.

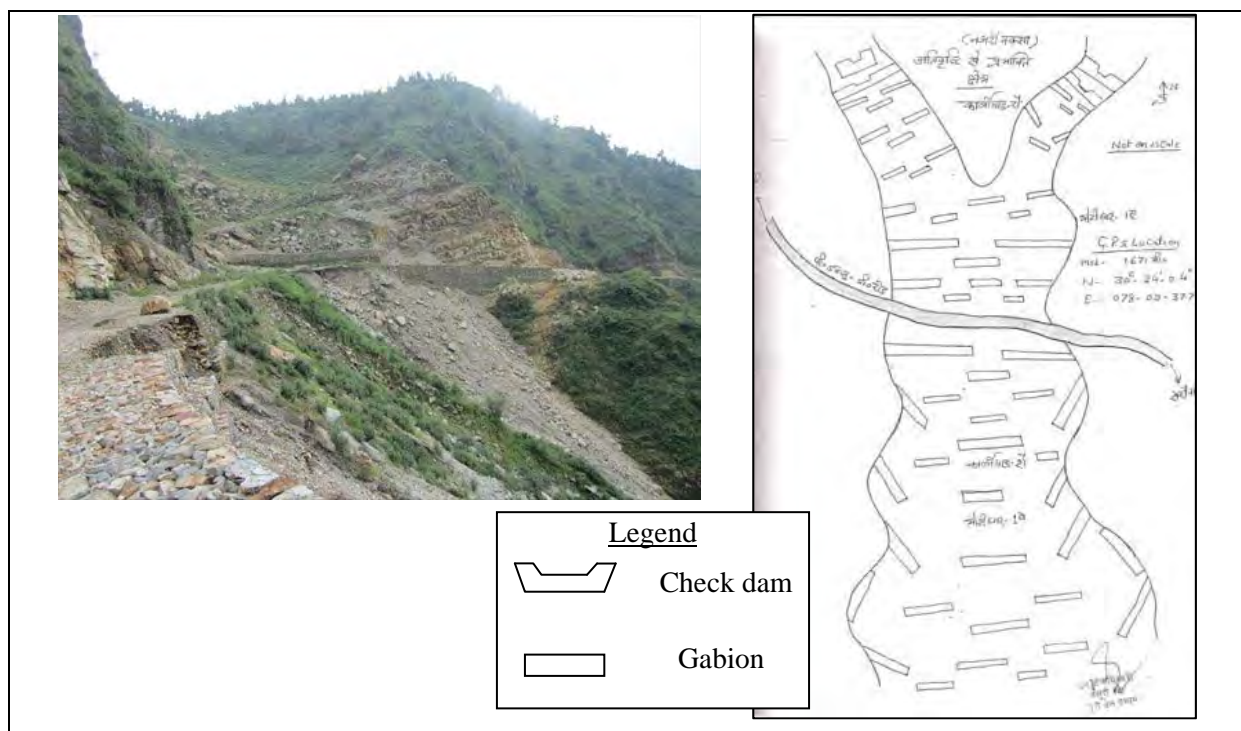
5.3.2 Erosion Control and Sediment Disaster Mitigation Techniques of UKFD

The JICA Preparatory Survey Team has undertaken intensive field visits and interactions with field officers, despite of difficulties in accessibility after the disaster and during the monsoon season.

During the field visit, a significant slope failure was observed at one place, and the UKFD plans to introduce certain countermeasures based on the technical manual. The countermeasures planned are mainly:

- To set the masonry on the top on slope.
- To arrange the gabions on the whole slope.

The photo of site and plan drawn by a forest officer are shown below:



Source: JICA Preparatory Survey Team

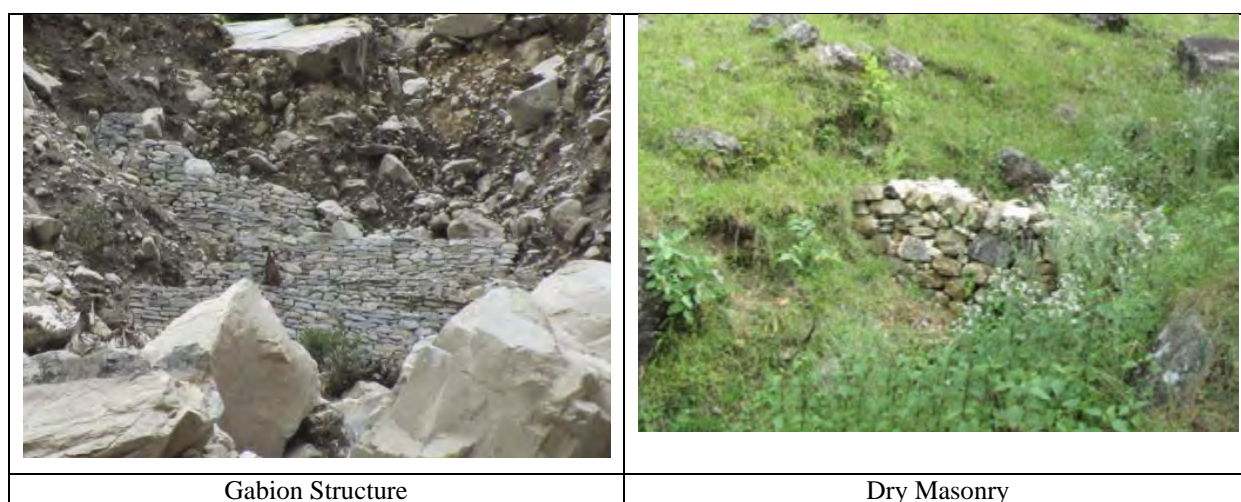
Figure 5.3.2 A Sample of Disaster Prevention Plan Prepared by the Forest Department

Technically, the plan has the following problems:

- The mechanism of disaster is not analyzed adequately and scientifically.
- The characteristics and specific functions of countermeasures are not considered properly for a particular phenomenon.
- The construction safety and workability of the site have not been studied properly.
- The specifications of each facility and elements of countermeasures are not elaborated (e.g., the size and type of wire for gabion, etc.)

5.3.3 Exceeding Focus on Dry Masonries and Gabion Structures

The intensive site visits and interactions with the officers of UKFD revealed that the department prefers the construction of structures of dry masonries and gabion, probably because of the budgetary limitations and lack of technical expertise. The samples of masonries (wet and dry) and gabion are constructed for gully plugging as shown below:



Source: JICA Preparatory Survey Team

Figure 5.3.3 Countermeasure for Gully

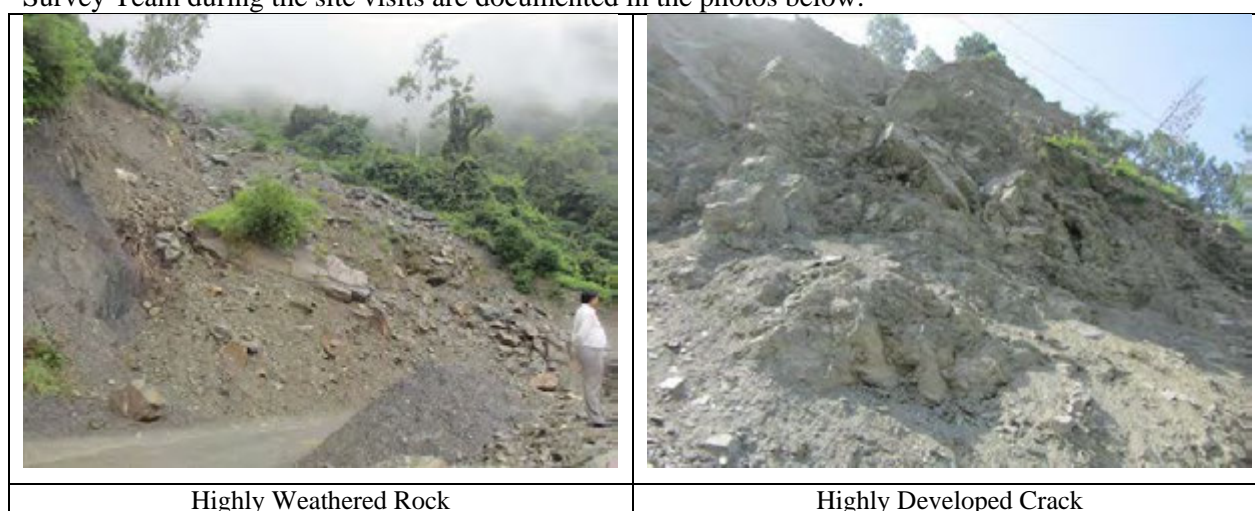
It appeared that these countermeasures are expected to have similar functions as a small check dam. However, dry masonries cannot function as a small check dam, and the materials would be washed away at the time of debris flow and become a “killing weapon”. Similarly, the gabion structures have limited durability and resistance toward the flow and should not be adopted for such a long, fragile, steep slope. The planner should scientifically study the site condition properly and understand the characteristics and limitations of each countermeasure before planning and executing the work.

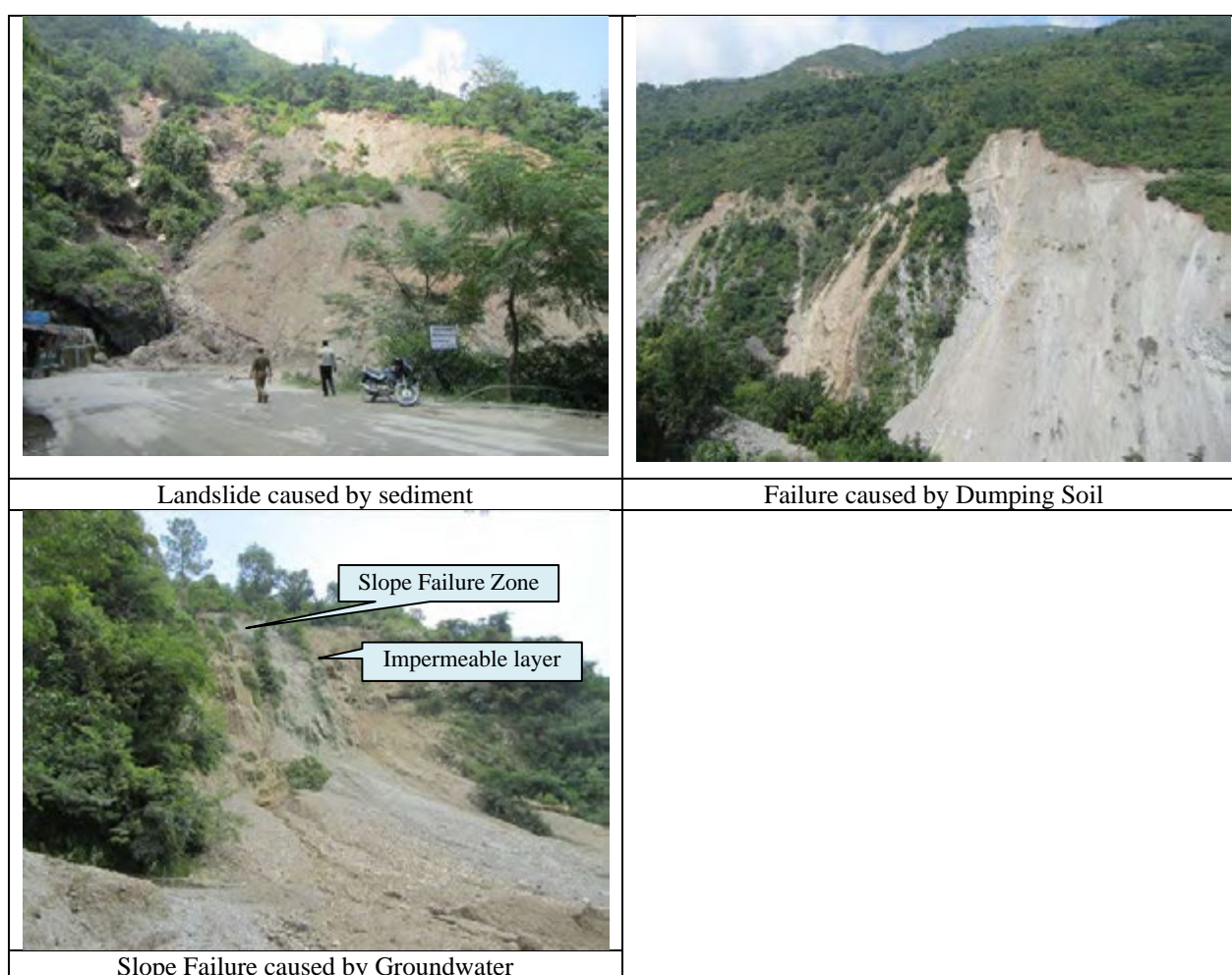
5.3.4 Unattended Problems of Road

The types of slope failure are classified as:

- Surface slope failure
- Rock fall
- Landslide
- River erosion

Certain observation and analysis on the types of slope failures and their mechanisms by the JICA Survey Team during the site visits are documented in the photos below:



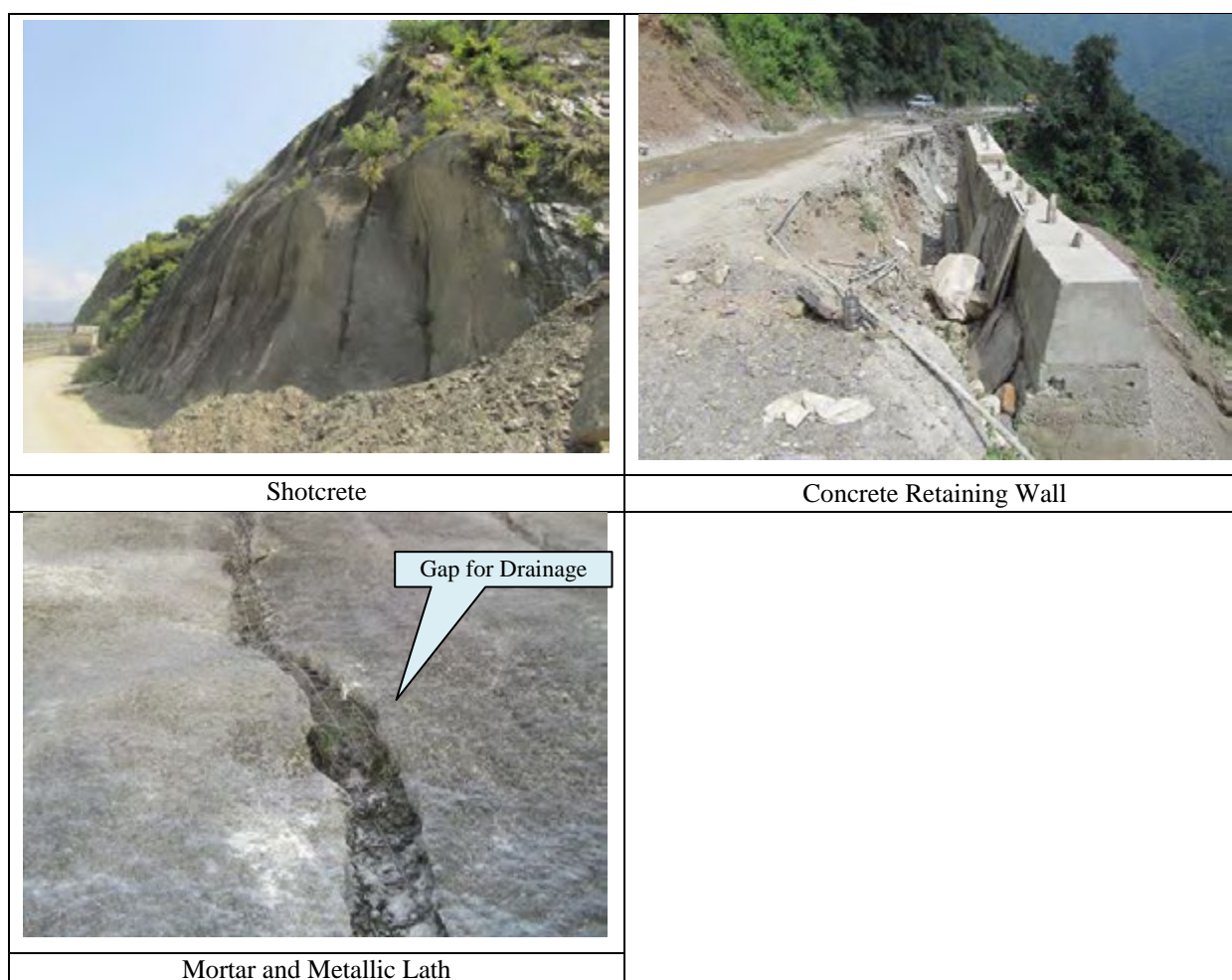


Source: JICA Preparatory Survey Team

Figure 5.3.4 Site Photographs of Landslide and Slope Failure induced by Various Causes

The countermeasure adopted in many cases in Uttarakhand is construction of a retaining wall by masonry, concrete and gabion, especially along the roads. In general, these kind of simple countermeasures are adequately undertaken. While shotcrete and crib works are also observed in the dam area or along the important roads, the training walls of masonry, concrete and gabion would not be sufficient countermeasures for any type of landslides indicated above.

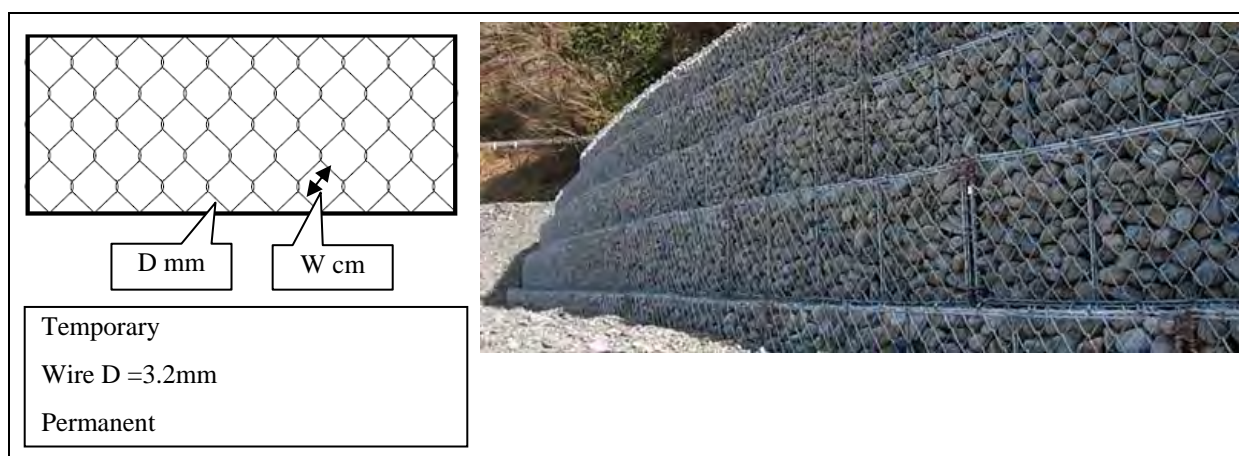




Source: JICA Preparatory Survey Team

Figure 5.3.5 Site Photographs showing Characteristics of Slope Failure Countermeasure

2 mm gauge wire is widely used in Uttarakhand, but it lacks strengths and durability. It is recommended to use at least 3.2 mm wire, preferably more than 4 mm in the conditions like Uttarakhand.



Source by Japan Jakago Association All Rights Reserved
http://jakago.jp/product.html#panelbox_jakago compiled by JICA Preparatory Survey Team

Figure 5.3.6 Sample Gabion Structure in Japan

The road construction and maintenance are executed by the BRO and PWD. Their technical expertise may have to be improved significantly, and the technologies of contractors and consultants also need to be improved, based on the field observation by the JICA Survey Team.

5.3.5 Unattended Problems of River Disasters

During the field visits, a number of river training interventions were observed, including riverbed protection, river bank protection, etc. However, the number of such works is limited, and it was observed that many key areas that require protection, e.g., rivers that are close to the highways and other major infrastructure, are largely unattended. Even if certain measures are introduced, such works are not adequate to address the issue of long-term protection of the sites.

Overall, the river training must be enhanced to a great extent in Uttarakhand in view of geographical features and present conditions in the state to protect public assets, habitations and human lives.

The rivers training works in the state have been undertaken by the Irrigation Department, PWD and power corporations. The experiences of UKFD are limited to a minor protection works for gullies and small creeks inside the forestlands.

	
Slope Failure caused by River Erosion	The river erosion is causing minor slope failure and appears to bring down large soil mass and road on the slope in future
	
Slope failure required river training to protect road	River training (spur) by concrete blocks and wet masonry but damaged by the strong current

Source: JICA Preparatory Survey Team

Figure 5.3.7 Site Photographs of Slope Failure caused by Inadequate River Training

Chapter 6 NEEDS FOR EXTERNAL SUPPORT

6.1 Potential Areas for Support and Gap between Requirements and Responses

As discussed in the previous sections, the damages created by the recent disaster have been assessed by various agencies, and a number of agencies and organizations, both internal and external, have planned and committed to extend their supports for the recovery.

The table below summarizes the areas that would require support and gap between the requirements and supports to be provided.

Table 6.1.1 Gap between Requirement and Planned Support for Recovering from Disaster

Area	Requirement	Planned Support and Gap	Needs	Japan's Technical Advantage
Slope Stabilization	A lot of slope failures occur within the forestlands under the control and management of UKFD, which are causing damages of public assets as roads and buildings. However, UKFD has very limited experiences and technical expertise in this aspect.	a. No plan to support UKFD from the perspective of disaster mitigation, except JICA. Financial as well as technical supports are required to a great extent in this sector. Japan has technological advantage in this sector.	High	High
	Slopes along the roads are stabilized mainly by PWD. However, many sites and areas are unattended due mainly to the budget constraints. Technical expertise of PWD in this aspect is quoted as limited.	b. The WB and ADB will support the State Government for the slope stabilization works along the damaged roads. However, the slopes that were not damaged this time but have high risk of problems in future will be unattended. Technical support by the donor agencies in this aspect is uncertain. Japan has technological advantage in this sector.	Medium	High
Roads and Other Infrastructure for Access	As discussed in the earlier part of this report, the road infrastructure was damaged to a great extent by the recent disaster.	c. The WB and ADB will support the State Government for the rehabilitation of damaged roads. However, the roads that were not damaged this time but have high risk of future damages will be unattended. d. During the recent disaster, the forest roads under the management of UKFD served as alternative escape routes for the affected population. Except JICA, no other donor agencies have committed to supporting the rehabilitation and further development of forest roads networks.	Medium	Medium

Area	Requirement	Planned Support and Gap	Needs	Japan's Technical Advantage
River Training	River training is largely unattended to protect roads, villages and other important public assets. Erosion and slope failures occur because of unprotected rivers. The technical expertise of PWD and Irrigation Department appeared to be inadequate.	e. The WB and ADB may support certain river training works close to the roads that they will rehabilitate. While the implementing agencies of WB/ADB projects will be PWD, the river training supposed to be undertaken by the Irrigation Department may not be supported. Technical support by the donor agencies in this aspect is uncertain. Japan has technological advantage in this sector.	High	High
Early Warning System and Associated Supports	The recent disaster revealed that the DRR planning and early warning system in place did not function properly. The technologies for remote sensing and GIS mapping are developed, but application and utilization of those technologies for actual DRR are found to be inappropriate.	f. The WB and GoI will support the further development of GIS laboratories of DMMC and Uttarakhand Space Application Centre for DRR planning and early warning system. However, the scale of such support is still unknown. Japan has technological advantage in this sector. The supports are also uncertain for the research on the disaster mechanisms (Climate Change, glacier melting, etc.), development of wireless communication networks to the rural areas, community education, community-based DRR, etc.	Uncertain	Medium
	While Uttarakhand sits on the high earthquake risk areas, the DRR and warning system for the seismic disaster are also required.	g. The supports to date focus on the recovery and mitigation of sediment disasters. The technologies for the early warning system for seismic disasters are still developing.	Uncertain	Uncertain
Capacity Building	There are great needs for capacity building of all the aspects of Disaster Risk Reduction in the state. One key areas identified was the development of access points (heliports) for rescue operations. Also the emergency shelters for survival during the most critical time (the first several days after the disaster) are identified as critical.	h. No donor agencies so far has committed to support the constructions of emergency shelters and heliports at strategic locations. Apart from the capacity building for the rescue operations, the needs for other areas for recovery may not be addressed adequately.	High	Medium

Area	Requirement	Planned Support and Gap	Needs	Japan's Technical Advantage
Housing, Resettlement and Other Community Infrastructure	Large number of people lost their houses, and village infrastructure were damaged. Some villages were completely washed away, and people need to be replaced to resettlement areas.	i. The WB, ADB and GOI will support the State government. UKFD may have to avail a part of forestlands and convert some areas to non-forests. These are political decisions that a bilateral donor would not be able to support.	Low	Low
Livelihood Improvement and Tourism Development	People are heavily dependent on the farming, livestock and businesses associated with those primary industries. Many people lost the means and opportunities for their livelihoods, which need to be rebuilt.	j. ADB plans to support the rehabilitation of tourism infrastructure, especially the major pilgrimage sites, in the most affected areas. Donors' supports so far focus on the rehabilitation of major infrastructure, such as roads and bridges, which are vital to the livelihood development. However, non-infrastructure support, such as credit facilities, re-development of small livelihood resources, enterprise re-building, skill upgradation, marketing support, etc. are not yet addressed.	High	Medium
Basic Human Needs	Recovery of damaged health facilities, educational infrastructure, personnel, food security, etc. is another area that requires great investment.	k. International and local NGOs and GoI and State Government will support this sector. The scale of their supports is uncertain.	Uncertain	Low

Source: JICA Preparatory Survey Team

6.2 Slope Stabilization, River Training and Capacity Building

Overall recommendations on slope stabilization, river training and capacity building indicated in the table above are summarized in **Chapter 6 of Volume I** of this report as **Project Component 4: Erosion Control and Sediment Disaster Mitigation**.

In the irrigation sector, all damaged schemes and infrastructure identified were public investments. During the upcoming season, the flood protection structures and diversion bunds should be rehabilitated on a priority basis to avert further losses and damages.

It was stated at a national workshop that toe erosion by untrained rivers has been more devastating than landslides. Reservoir area of hydropower projects must be protected and the roads must be aligned.¹

The Department of Irrigation is formulating policies and guidelines on the restoration work and to deal with the issue of training on two fronts, 1) restrict the changing course of the river, 2) prevent further landslides. It has prioritized five rivers for training, namely; Bhagirathi, Alaknanda, Mandakini, Kali Ganga, Assiganga, which essentially flow along populated towns in the mountains. They would be customizing the guidelines as per the requirements of the geographic area of intervention.

¹ Shri K.K Razdan, Chief Engineer, Border Roads Organization, Proceedings of the National Workshop on Uttarakhand Disaster 2013: Lessons Learnt, P.14.

The Irrigation Department is also in the process of drafting proposals for the Ganga Flood Control Commission², which would further submit it to the Government of India. Since Uttarakhand is a special category state, the money from Government of India would be in the nature of 90% grant. 10% of the costs need to be borne by the state government.

The work would be done in a phased manner and similarly any grants requested would follow the phases. The irrigation department has a two-tiered Technical Advisory Committee to vet and approve projects. The total preliminary estimate of damages for the State is estimated to be around INR 244 crores (INR 2440 million) or USD 41 million. The contracts issued by the irrigation department are based on the cost of work and prior experience of the bidder, who are categorized as per an internal scale.

The Irrigation Department is in the process of restoring the irrigation network with temporary measures such as stacking of sand bags and connecting the damaged stretches with pipes, but given the nature of the disaster, it has been rather challenging. The continued rains and difficult terrain has hindered the immediate restoration work and a detailed investigation of the damages in order to design the recovery interventions. The total estimated cost of rehabilitation of irrigation infrastructure in the five districts of Bageshwar, Chamoli, Pithoragarh, Rudrapur and Uttarkashi is INR 1,393 million (USD 23.22 million). The rehabilitation cost for the district of Uttarkashi alone, which sustained the highest damage, is estimated at INR 690 million (USD 11.5 million).

Further analysis of the implementation process on the ground needs to be conducted in order to ensure high quality last mile implementation by applying design sense and integrating plans with those of the other sectors. The plans of the Department of Irrigation ought to be integrated/ triangulated with data, maps or images available with the Space Application Centre, Watershed Directorate and the Disaster Mitigation and Management Centre, in Uttarakhand. Some of the departments which needs to be a partner in the implementation are Department of Irrigation, Watershed Management Directorate, Department of Forests, Uttarakhand Space Application Center and Disaster Mitigation and Management Center.

The Department of Irrigation could be the nodal agency for the program, however, has no past experience of working with external funders. The Disaster Mitigation and Management Center could play an advisory role to the project, helping it in formulating policies and guidelines where needed and Uttarakhand Space Application Center could be the agency providing technical support to the project with maps and data.

During the high peak during disasters, only UKFD's wireless networks were functioning to get the information, as experienced by the state. This activity can be expanded to the large extent in addition to the suggestions by the JICA Survey Team.

In the villages there is availability of personnel retired from Army/ Central Reserve Police Force/ Indo-Tibetan Border Police/ physically fit/ young/ etc. These personnel's will form a task force, will get trained from time to time and can be utilized themselves during emergencies on daily wages. This may be linked into our watershed wise/ micro watershed wise/ etc. These task forces will be having the rescue vans, ambulance services, cluster level equipment, umbrella, clothes etc.

6.3 Road Development of and Other Infrastructure for Access

The WB and ADB will finance the rehabilitation of damaged roads. All concerned interviewees confirmed that there will be not further needs/ scope for the Japanese Government to support this.

² Ganga Flood Control Commission (GFCC), a subordinate office of Ministry of Water Resources, with its headquarter at Patna, was created in the year 1972 to deal with floods and its management in Ganga Basin States vide Govt. of India Resolution No. F.C. 47(3)/72 dated 18th April 1972, as secretariat and executive wing of Ganga Flood Control Board, headed by Union Minister of Water Resources, Chief Ministers of basin States or their representative and Members, Planning Commission, are the members of the Board. Chairman, GFCC acts as the Member-Secretary of the Board. Website: <http://gfcc.bih.nic.in>

However, there are certain routes/ areas that the rehabilitation of damaged roads is not feasible or desirable in view of extent of damages and terrains. In such cases, alternative routes need to be developed, and re-alignment of such roads needs to be completed.

Also, there are roads and routes that were not damaged heavily this time but have high disaster risks. Those roads need to be improved.

The State Government prepared a proposal for this to avail the funding from the Central Government (**Attachment 6.3.1**). A tentative list of 20 such routes has been drawn by the PWD and is being sent to the Central Government under “Special Central Assistance”. The tentative total budget under this proposal is INR 8,365 million. The high officials interviewed during the JICA Survey mentioned that it is expected that the Central Government would contribute around INR 5,000 million for this. A shortage of INR 3,365 million would have to come from other sources. However, the situation appeared to change daily.

The high officials interviewed also said that there is a huge need for village roads which approximate length is 15,000 km (nearly half the total length of the road in the state). They said the WB is approximately funding 4,000 km damaged roads. The World Bank officials interviewed indicated that the WB will cover all the damaged village roads for rehabilitation. PWD, however, appeared to require the improvement of undamaged village roads. The PWD high officials also underlined the importance of village roads as they are directly connected to the livelihoods of people in terms of tourism, horticulture, floriculture, access to markets, etc.

6.4 Support for Livelihood Development

The Government of India, through the Planning Commission is one of the major promoters of livelihoods initiatives post disaster. They are initiating some of the works like skill upgradation, employment diversification and horizontal expansion of the existing employment options. The total funding allocation for the same is around INR 60,000 to 70,000 million.

Selection of the community could be one of the critical issues owing to limited resources available with JICA. The targeting of the community needs to be carried out in a scientific and rational way.

Since this is a post disaster livelihoods reconstruction program, the target community for the program should be the community who has been impacted by the disaster in one way or the other. The impact can be assessed in the following aspects:

- Loss of life in the family;
- Permanent or semi-permanent injury to the person within the family involved in livelihood generation for the family;
- Loss of shelter;
- Loss of productive land;
- Loss of standing crop; and
- Loss of other sources of livelihoods like cattle, poultry etc.

Agriculture has been practiced at a subsistence level and has been providing food to the family for around three months after the harvest of the crop. Efforts should be made to convert it from subsistence economy to income generating activity. The food products of Uttarakhand have been traditionally known to be organic in nature which fetches a high market price for the product which is marketed. While focusing on agriculture as a marketable commodity, its identity as an organic produce should be enhanced further.

Apart from the damage to the standing crop, agriculture land has also been washed off at some places, efforts should be made to provide the lost land to the community. Since Uttarakhand has huge land problem because of its topography, the focus should also be in providing alternative livelihood options.

Various types of alternative livelihoods have been provided to the community under the Ajeevika Program and other schemes. These livelihood options should be extended to the community on a priority basis which has lost the land and does not have other options.

The road network and other tourism related infrastructure has been damaged to such an extent that according to some of the government estimates, it might take more than 4-5 years for the religious tourism to revive and operate in its full capacity. There is an immediate need to rehabilitate the community dependent on tourism through some other livelihood sources.

One of the options which could be experimented and taken up on a large scale later is the introduction and promotion of ropeways which would connect the community to the market.

There is a discussion going around amongst the policy makers regarding reviving the tourism sector. The policy makers are in a process of defining the carrying capacity of the infrastructure associated with the tourism. This might lead to regulated reduction in tourists. If the tourists are regulated and reduced, this might lead to retrenchment of several communities dependent on tourism. Alternative livelihood option needs to be provided to the communities who will bear the brunt of retrenchment.

Attachment 4.2.1 World Bank and Asian Development Bank Funding Pattern: Disaster Relief Emergency Loan 2013-14 Conversion Rate:

1 USD=INR 65

S.No	Sector/Area	Total	World Bank New		ADB New Project		World Bank		ADB Existing		Other Go & GO		Total		
		USD Million	INR 10	USD Million	INR 10	USD Million	INR 10	USD Million	INR 10	USD Million	INR 10	USD Million	INR 10	USD Million	INR 10 Million
1	Housing	25.00	162.50	25.00	162.50	—	—	—	—	—	—	—	—	25.00	162.50
2	Public Buildings	17.00	110.50	17.00	110.50	—	—	—	—	—	—	—	—	17.00	110.50
3	Roads and Bridges														
(a)	Border Road Organization	112.13	728.85	—	—	—	—	—	—	—	—	97.50	633.75	97.50	633.75
(b)	National Highways	79.99	519.94	—	—	—	—	—	—	—	—	69.56	452.14	69.56	452.14
(c)	State Highways, Major District Roads	92.78	603.07	—	—	92.78	603.07	—	—	—	—	—	—	92.78	603.07
(d)	Other District Roads	12.86	83.59	12.86	83.59	—	—	—	—	—	—	—	—	12.86	83.59
(e)	Village Roads PMGSY	20.86	135.59	—	—	—	—	20.86	135.59	—	—	—	—	20.86	135.59
(f)	Village Roads (non PMGSY)	104.68	680.42	30.00	195.00	—	—	74.68	485.42	—	—	—	—	104.68	680.42
(g)	Bridle Roads	3.28	21.32	3.28	21.32	—	—	—	—	—	—	—	—	3.28	21.32
(h)	Motor Bridges	5.21	33.87	—	—	5.21	33.87	—	—	—	—	—	—	5.21	33.87
(i)	Bridle Bridges	19.22	124.93	19.22	124.93	—	—	—	—	—	—	—	—	19.22	124.93
(j)	Trek Routes—places pf tourism	NA	—	—	—	10.00	65.00	—	—	—	—	—	—	10.00	65.00
4	Urban	21.00	136.00	—	—	21.00	136.50	—	—	—	—	—	—	21.00	136.50
5	Rural Water Supply	24.00	156.00	—	—	—	—	24.00	156.00	—	—	—	—	24.00	156.00
6	Livelihood	28.00	182.00	—	—	—	—	—	—	—	—	28.00	182.00	28.00	182.00
7	Irrigation/ Flood Protection	23.00	149.50	—	—	—	—	—	—	—	—	—	—	—	—
8	Tourism	19.50	126.75	—	—	30.00	195.00	—	—	—	—	—	—	30.00	195.00
9	Energy/Power	44.00	286.00	—	—	—	—	—	—	15.00	97.50	29.00	188.50	44.00	286.00
10	Forest and Bio Diversity	9.00	58.50	—	—	—	—	—	—	—	—	9.00	58.50	9.00	58.50
SUB-TOTAL		661.51	4,299.82	107.36	697.84	158.99	1,033.54	119.54	777.01	15.00	97.50	233.06	1,514.89	633.95	4,120.68
	Others	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	TA Support/TAC etc	—	—	—	—	20.00	130.00	—	—	—	—	—	—	20.00	130.00
	Contingencies	—	—	—	—	21.00	136.50	—	—	—	—	—	—	21.00	136.50
	TA	—	—	20.00	130.00	—	—	—	—	—	—	—	—	20.00	130.00
	DRS	—	—	15.00	97.50	—	—	—	—	—	—	—	—	15.00	97.50
	IAC	—	—	8.00	52.00	—	—	—	—	—	—	—	—	8.00	52.00
Grand Total		661.51	4,299.82	150.36	977.34	199.99	1,299.94	119.54	777.01	15.00	97.50	233.06	1,514.89	717.95	4,666.68

Attachment 6.3.1 Project Proposed for Road Improvement under Special Central Assistance (SCA)

S. No.	Name of Damaged Motor Road	Name of Division	Total length of existing road (In Km.)	Construction & Improvement of Proposed Alternate Route		Conversion of existing road from Single lane to 1.50 lane and Improvement		Total		Remarks
				Length (Km)	Amount Req (10 Million)	Length (Km)	Amount Req (INR 10 Million)	Length (Km)	Amount Req (INR 10 Million)	
1	Conversion of Mothrowal- Dudhlee- Diowala Motor Road upto 2 lane & Improvement	T. D. Rishikesh	16.37	0	0	16.37	10.57	16.37	10.57	This road is a useful road from Dehradun to Doiwala. Once this road is converted into a two lane road, it would reduce the traffic pressure on the Rishikesh-Dehradun route and in future will also serve as a ring road
2	Upgradation & Decking work of Railway Bridge over River Ganga at Balawali in Haridwar between Iaksar & Najibabad	P. D. Haridwar	1 No.	0	0	1 No.	8.71	1 No.	8.71	This upgraded and decked bridge would connect Uttarakhand and Uttar Pradesh effectively and would ease the pressure of traffic on the other states
3	Construction of 13 No. Bridges on Roshnabad-Biharigarh Motor Road in District Haridwar	P. D. Haridwar	13 No.	0	0	13 No.	1.85	13 No.	1.85	This would be a shorter route between Haridwar and Dehradun and would also lead to collaboration between Uttarakhand and Uttar Pradesh
4	Widening and Improvement of Gadarpur-Dineshpur-Matkota-Haldwani Motor Road in	P. D. Rudrapur	15	0	0	15	25.31	15	25.31	This road is meant for the industrial zone and is necessary to carry the heavy vehicles
5	Improvement & reconstruction of Suvakholi-Almas-Bhavan-Nagun Motor Road including Supply and fixing of Crash Barrier	T. D. Thatyur	32.85	0	0	32.85	59.13	32.85	59.13	This would be a shorter route between Uttarkashi and Dehradun
6	Improvement & reconstruction of Gadoliya- Tepri Motor road	P. D. New Tehri	12	0	0	12	21.6	12	21.6	This is part of the main route between Tehri and Kedarnath
7	Improvement & reconstruction of Tehi-Kirtinagar Motor road from Km 18 to 29 (Bhagirathipuram to	P. D. New Tehri	12	0	0	12	21.6	12	21.6	This is part of the main route between Tehri and Kedarnath
8	Conversion of Roddhar-devprayag Motor road from single lane to 1.50 lane & Improvement	T. D. Kirtinagar	26	0	0	26	46.8	26	46.8	This is an important oute between Devprayag and Tehri. It would be used as an alternate route for NH 8
9	Conversion of Ghansali- Kaimundkhal Motor road from single lane to 1.50 lane & Improvement	T. D. Ghansali	33	0	0	33	59.4	33	59.4	This route is used as a religious route between Uttarkashi and Kedarnath
10	Conversion of Uttarkashi- Ghansali- Tilwara Motor road from single lane to 1.50 lane & Improvement	T. D. Ghansali	55	0	0	55	99	55	99	This route is used as a religious route between Uttarkashi and Kedarnath
11	Conversion of Tyuni- Naugaon- Purola Motor road (Km 21 to 66) from single lane to 1.50 lane	C. D. Purola T. D. Chakrata	46	0	0	46	82.8	46	82.8	This route connects a horticulture zone and would also provide a good route to go from Himachal Pradesh to
12	Improvement & reconstruction of Bageshwar-Kapkot Motor road	P. D. Bageshwar C.	26	0	0	26	46.8	26	46.8	This route connect Districts Bageshwar and Pithoragarh and is a shorter one
13	Improvement & reconstruction of Kapkot- Shama Motor road	C. D. Kapkot	54	0	0	54	97.2	54	97.2	This route connect Districts Bageshwar and Pithoragarh and is a shorter one
14	Govindghat- Ghangariya- Hemkund Bridle road (DoubleTrack)	P.D. Gopeshwar	19	0	0	19	17.1	19	17.1	This is the only route to the holy Sikh shrine of Shri Hemkund Sahab
15	Reconstruction and Improvement of Sonprayag-Gaurikund Bridle Road	C. D. Ukhimath	5	5	2.25	0	0	5	2.25	This route is necessary to make available a Bridle path on the Rudraprayag-Gaurikund road
16	Gaurikund to Kedarnath Bridle Road (Doble Track)	C. D. Ukhimath	17	17	15.3	0	0	17	15.3	This is part of the main route to Kedarnath
17	Construction of Bridle road from Chaumassi to Kedarnath via Kham Bugyaal (Double Track)	C. D. Ukhimath	24	24	21.6	0	0	24	21.6	This is a proposed alternative bridle route to Kedarnath

S. No.	Name of Damaged Motor Road	Name of Division	Total length of existing road (In Km.)	Construction & Improvement of Proposed Alternate Route		Conversion of existing road from Single lane to 1.50 lane and Improvement		Total		Remarks
				Length (Km)	Amount Req (10 Million)	Length (Km)	Amount Req (INR 10 Million)	Length (Km)	Amount Req (INR 10 Million)	
18	Conversion of Kirtinagr- Badiyargarh- Dhaurangee Bhardar- Saurakhal- Tilwara Motor road	P. D. Rudraprayag T. D. Kirtinagar	85.7	0	0	85.7	154.26	85.7	154.26	This is meant for Srinagar to Kedarnath, an alternative to the Rishikesh-Badrinath National Highway
19	Aungi- Jakhol- Raithal- Barsu- Bhukki Motor road	P. D. Bhatwari	21.5	23	12.06	21.5	9.56	44.5	21.62	This is an alternative route from Gangotri to Uttarkashi. There is a 2.5 km road constructed till Aungi. The section from Aungi to Jakhol 12 kms is proposed, Jakhol to Raithal 14 kms is constructed, Raithal to Barsu Bhukki 11 kms is proposed. Bhukki to NH 5 kms is constructed.
20	Tekhla- Gangnani Motor road	P. D. Bhatwari	0	45	23.6	0	0	45	23.6	There is a DGBR road constructed uptill Tekhla. The proposed alternative route would meet the NH at Gagnani
	Total		500.42	114	74.81	454.42	761.69	568.42	836.5	
			+ 14 No.			+ 14 No.		+ 14 No.		