Uttarakhand
Decentralized Watershed Development II Project

Environmental and Social Management Framework

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LIST OF ABBREVIATIONS

ABSO	Agribusiness Support Organisation
DPD	Deputy Project Director
ESA	Environment and Social Assessment
FF	Farmer's Federation
FGD	Focused Group Discussion
FIG	Farmer's Intrest Group
FNGO	Field NGO
GP	Gram Panchayat
GPWDP	Gram Panchayat Watershed Development Plan
IEC	Information, Education and Communication
MDT	Multi Disciplinary Team
PD	Project Director
PME	Participatory Monitoring & Evaluation
PMU	Project Management Unit
PNGO	Partner NGO
RVC	Revenue Village Committee (Informal body at Revenue Village of suggestive/consultative nature)
RVC Proposals	Proposals made by RVC at level of revenue village
SHG	Self Help Group
UG	User Group
VLI	Village Level Institutions
VP	Van Panchayat
WAS	Women Aam Sabha
WMD	Watershed Management Directorate, Dehradun, Uttarakhand.
WWMC	Water &Watershed Management Committee

ICM- IPM

FFS	Farmer's Field School
FSI	Farming System Intensification
FYM	Farm Yard Manure
ICM	Integrated Crop Management
IPDM	Integrated Pest and Disease Management
IPM	Integrated Pest Management
IPNM	Integrated Plant Nutrient Management
IWM	Integrated Weed Management
STCR	Soil Test Crop Response
WHO	World Health Organisations
EFC	Environment Friendly Chemicals
TOT	Training of Trainers
NPM	Non- Pesticidal Management

Chapter-1
INTRODUCTION

1.1 BACKGROUND

The state of Uttarakhand, embodying the Kumaon and Garhwal Himalayas with a geographical area of about 53,485 sq. km, has human population of 1,01,16752 persons. The state, has two administrative divisions - Garhwal and Kumaon, which consists of 13 districts – Dehradun, Uttarkashi, Chamoli, Pauri Garhwal, Tehri Garhwal, Rudraprayag, Haridwar (in Garhwal Division), Almora, Pithoragarh, Nainital, Bageshwar, Champawat and Udham Singh Nagar (in Kumaon Division). It is further divided into 95 development blocks, 670 Nyay Panchayats, 7708 Gram Sabhas and 15751 inhabited villages. The population constitutes 0.84% of the total population of Indian Republic.

Within an altitudinal variation ranging from 200 m to more than 8000 m above msl, the state comprises five lithotectonically and physiographically distinct subdivisions namely, the Outer Himalaya comprising the Tarai and Bhabhar, Sub-Himalayan belt of the Siwalik, the Lesser Himalaya, the Great Himalaya and the Trans-Himalaya or Tethys. Human habitation is found up to an altitude of 3500 m asl; however, the zone between 1200 - 2000 m, largely falling in the Lesser Himalaya (1500 - 2500 msl), is densely populated. In this region the human population is continually increasing and the region is experiencing major difficulties in sustaining its growing population on its squeezing environmental resources - land availability, forests and grasslands, water resource, etc. Much of the environmental resource degradation is governed by mountain specificities, viz., inaccessibility, fragility, marginality, diversity (heterogeneity), niche (natural suitability) and adaptability (human adaptation) apart from the growing population.

Table 1: Altitude zone wise forest cover and distribution of geographical areas of the state

Altitudinal Zone	**Percentage of area**	**Forest cover** (% of total area)*
Below 1000 meter	26.00	13.02
1000 - 2000 meter	33.00	18.40
2000 - 3000 meter	13.00	10.95
Above 3000 meter	28.00	3.43
Uttarakhand State	100.00	45.80

* *The State of Forests Reports, 2011, MoE&F GoI*

The economy and livelihood patterns of the people of the state are primarily built around the forests. The State of Forests Reports, 2011 of Ministry of Environment and Forests, Government of India estimated the recorded forest area of the state as 64.79% of the total area. Further, a 5.14 million livestock population in the state (according to the Livestock Census of 2007) is dependent on forests for fodder.

The population of the state primarily depends on agriculture for livelihood; about 70% of the population is engaged in agriculture. Out of total reported area, only 14.09% is under cultivation. More than 81.0% of the cultivated land in the Hills is rain fed. The cropping intensity for hill agriculture is 152.7%. The landholdings are small and scattered. The average land holding is around 0.68 ha (that too is divided into many patches) in the hills and 1.77 ha in the plains.

Because of the extraction of natural resources by the inhabitants for subsistence living far beyond their capacity to regenerate, many areas of the state are facing degradation of natural resources. For example, against the requirement of 18 ha of forests land including 5-12 ha of well-stocked forests, per ha of cultivated land, the ratio of forest to agriculture is only 1.33:1 and the ratio of well-stocked forests to agricultural land is only 0.84:1. Further, soil erosion from the different land use systems in the watersheds has increased many-fold and land productivity has been declining. The water retention capacity of the fragile watersheds has reduced and people are now facing acute shortage of water. Grazing intensity is high; each ha supports about 7.99 units of livestock against the appropriate 2 livestock units. The green fodder requirement has been estimated as 259 lakh mt per annum, but present production is only 52 lakh mt. both from the forests and agriculture.

To reverse this order of deterioration of natural resources and support livelihood activities for the inhabitants' watershed management has been taken up as the functional and planning tool for conservation and sustainable development of natural resources. Government of Uttarakhand has implemented a number of watershed projects through its Watershed Management Directorate (WMD). Uttarakhand Decentralized Watershed Development Project, UDWDP, Phase-I (2004-2012) was a successful project and World Bank approval is being sought for UDWDP Phase-II to be implemented from 2014 to 2021.

1.2 PROJECT OBJECTIVE

The PDO is to increase the efficiency of natural resource use and productivity of rainfed agriculture by participating communities in selected micro watersheds of the State of Uttarakhand.

1.3 PROJECT COMPONENTS

The proposed Uttarakhand Decentralized Watershed Management Project II would focus on catchment treatment of 220,000 ha of non-arable lands, which would enhance agriculture productivity on 40,000 ha of adjacent arable land. The proposed project will have four components: (a) Social Mobilization and Participatory Watershed Planning; (b) Watershed Treatment and Rainfed Area Development; (c) Enhanced Livelihood Opportunities; (d) Knowledge Management and Project Coordination

The components and their costing are as follows:-

1. **Social Mobilization and Participatory Watershed Planning (US $ 30 Million)**
   - Social Mobilization (US $ 28.7 Million)
   - Preparation of GPWDP/MWS Plans (US $ 1.3 Million)

2. **Watershed Treatment and Rain-fed Area Development (US $ 90.3 Million)**
   a. **Watershed Treatment and Source Sustainability (US$78.5 Million)**
   - Watershed Treatment (US $ 78.3 Million)
   - NRM Demonstrations (US $ 0.2 Million)

   b. **Rain-fed Agriculture Development (US$11.8 Million)**
   - Agriculture and Horticulture (US $ 7.8Million)
   - Animal Husbandry (US $ 3.2Million)
   - Fodder Production (US $ 0.8 Million)

3. **Enhancing Livelihood Opportunities (US$18.7 Million)**
   a. Agribusiness Support (US$9.1 Million)
   b. Support for Vulnerable Groups (US$7.2 Million)
   c. Consolidation of Gramya I Activities (US$2.4 Million)

4. **Knowledge Management and Project Coordination (US $ 31 Million)**
   a. **Knowledge Management (US$11.7 Million)**

- Capacity Building of Stakeholders (US $ 7.3 Million)
- Centre of Excellence for Watershed Management (US $ 0.8 Million)
- Information Education and Communication (US $ 1.0 Million)
- Monitoring, Evaluation and Learning (US $ 2.5 Million)

b. Project Coordination (US$19.3 Million)

1.4 PROJECT AREA

The proposed project area is spread over 263837 Ha. in 82 MWS (including 1 model MWS) belonging to 509 Gram Panchayats in 18 Developmental Blocks, of 8 hilly Districts in Uttarakhand. The project is likely to benefit 55,600 households, with a total population of 3.18 lakh which include small and marginal farmers, landless and transhumant communities. The project will be implemented through Panchayati Raj institutions with Gram Panchayat as the project implementing agency. The details about geographical area and population are given below in **Table 2 Details of Project Area Selected for UDWDP – II**

Table 2 Details of Project Area Selected for UDWDP – II

DISTRICT	Development Blocks	SWS	No. of MWS	Area (Ha.)	Forest Area (Ha.)	Agriculture Area (Ha.)	Blank (Ha.)	Gram Panchayat		Revenue Villages	
								No.	Aera (Ha.)	No.	Area (Ha.)
Almora	Dhauladevi, Bhasiyanchana	2	9	28396	14987	12303	1106	**85**	24340.64	186	23835.00
Uttarkashi	Mori, Naugaon, Purola	3	17	45103	31233	9727	4143	67	10268.67	119	10012.56
Dehradun	Kalsi, Chakrata	4	9	29242	8778	8270	12194	49	23012.69	74	21925.85
Tehri	Jaunpur	2	13	31730	11977	8306	11447	72	18641.86	151	18553.44
Rudraprayag	Ukhimath, Jakholi, Augustmuni	2	6	19201	11609	7449	143	65	8572.05	119	8429.67
Pithoragarh	Munsiyari, Didihat, Berinag	1	9	25739	17206	6350	2383	59	22069.89	137	20568.19
Bageshwar	Kapkot	2	11	55296	35666	6672	12920	48	33328.47	82	33964.28
Pauri	Pokhara, Ekeshwar	4	7	26713	9373	10980	6360	57	10549.00	185	10451.14
Model MWS	Raipur	1	1	2417	1365	789	95	7	2232.85	13	2232.85
	18	**21**	**82**	**263837**	**142194**	**70846**	**50791**	**509**	**153016.11**	**1066**	**149973**

1.5 CRITERIA FOR PROJECT AREA SELECTION

The project area selection was done using spatial data base using the following parameters:

i. **Erosion Intensity** (on the basis of data available at MWS level) E1, E2,E3 and E4 with land use as forest, agriculture and blank areas were demarcated. 50% weight-age was given to this parameter.

   To factor-in the prevalence (area) of the problem in absolute terms along with intensity of erosion, relative weights were assigned to each category within a micro-watershed (Annexure-I).

Category of Erosion Intensity	Relative weight
E1 – Slight	2
E2 – Moderate	4
E3 – Severe	8
E4 – Destroyed	10

To arrive at the total erosion intensity value, the formula used is:

$$\frac{(E1 \times 2) + (E2 \times 4) + (E3 \times 8) + (E4 \times 10)}{\text{Total Area of Micro-watershed}} = \text{Erosion intensity score.}$$

ii. **Socio-economic Status of communities** (at the sub- watershed level) SC/ST,BPL population poverty, prevalence of daily wage workers etc. were taken as the parameter and given 25% weight-age.

   Four indicators were combined to rank the socio-economic status of a block – (i) percentage of families below poverty line (BPL); (ii) Percentage of families from Scheduled Castes and Scheduled Tribes (government classification of population vulnerable to social and economic marginalization); (iii) percentage of families reliant on all forms of wage earning opportunities and, (iv) percentage of families from category (iii) that are reliant on agriculture labour opportunities. For computing the over-all socio-economic status of the block, equal weightage was given to all the four indicators.

iii. **Remoteness** (Status of available services and general facilities at block level) Due to the hilly terrain and poor network of access roads in Uttarakhand, remote villages have had limited opportunities to benefit from earlier development programs. To ensure that these villages were not ignored yet again, priority was given to those blocks that have more proportion of villages located at a distance greater than 5 kms from the nearest hospital/veterinary services, agriculture produce market, post office, fair price shops, commercial banks, block headquarters, agriculture input suppliers, etc. a 25% weight-age was assigned to these areas.

iv. Sub-Watershed already treated or under treatment through Externally Aided Projects (EAPs) and Government of India funded projects were excluded.

v. The areas falling in National Parks, Sanctuaries and watersheds in the command area (upstream and downstream of the Tehri dam) were also excluded.

1.6 NEED OF ESMF

Considering the fragile bio-physical and socio-economic fabrics of the region, an Environmental and Social Management Framework (ESMF) with mitigation based on experience from previous projects have been developed keeping in mind all levels - Government (facilitators) and local people (implementers), so that the impacts of the interventions made to watershed development are sustainable i.e environment-friendly, socially acceptable and economically feasible. Similarly, monitoring procedures need to be developed and followed in executing the interventions and monitoring their performance over a long term from an environment and social perspective. The role of local people as stakeholders need to be defined and fixed based on their skills, and capabilities, and responsibilities.

Considering that in the mountain state of Uttarakhand many of the components / sectors in a watershed (e.g., agriculture, forestry, livestock, horticulture, etc,) are interlinked with each other as resources flow from one component to other (Annexure-II), ESMF have taken care to develop such linkages between all watershed components in a sustainable manner.

The UDWDP-I ESMF has been expanded to include UDWDP-II concerns, in particular, inter-GP area treatment, and agribusiness strengthening, chance find procedures for physical and cultural properties and preparation of a transhumant action plan. A transhumant action plan has been developed specifically for transhumant groups which travel through the project target area, this

which will support livelihoods improvement, in particular, livestock health and extension services and facilitating linkages with public and private sector service providers.

The ESCP would include the environment and social assessment (ESA) as a tool for decision making to promote environmental and socially sound practices and also deliver the envisaged project objectives. The laws and acts applicable for the mountain ecosystem in general, and for Uttarakhand region in particular will also be kept in mind while developing the ESCPs.

1.7 METHODOLOGY ADOPTED

The Environmental and Social Code of Practices for UDWDP Phase II has been developed by the modifying the Environmental and Social Management Framework (ESMF) of UDWDP. The modifications have been done by incorporating the experience of first phase, feedbacks from project functionaries, community members and the suggestions from PRI members. To study the efficacy of the ESMF in the UDWDP-I, a study was conducted on its application in 40 GPs of UDWDP-I. The finding of this study and feedback from Consultation Workshop held with stakeholders on 5th Feb. 2013 has been incorporated.

1.7.1 Results of the study

UDWDP-I was successfully completed in 76 selected MWS in Middle Himalayas. About 468 Gram Panchayats identified in 18 Blocks of 11 Districts were participated in the project.

To assure that impacts of the interventions under UDWDP-1 would be environment-friendly, socially acceptable and economically feasible, the ESMF had been developed. The Environmental and Social Guidelines (ESG) of ESMF were made an integral part of the GPWDP and Sub-projects. Through these guidelines the objective was to minimize or mitigate the negative environmental and social impacts and to enhance the positive impacts. The environmental and social aspects were considered, implemented and monitored by all the project partners during GPWDP and Transhumant action plan preparation. This was a five stage process in which initially the capacity of the village community and project staff was build to apply environmental and social guidelines during the preparation of RVC proposals and Transhumant plans. As a result RVC proposals and action plans for transhumant followed the Environmental and Social Management Framework (ESMF) and conformed to the ESG. These ESG were applied to the draft GPWDPs and action plans for transhumant GPWDPs finalized in compliance with these ESG.

With a higher degree of participation, community members themselves planned and implemented the project activities. These watershed activities were in accordance with the ESMF criteria of the project.

Thus the objective of ESMF efficacy study was to find out the level of ESMF awareness, application of Environmental and Social Guidelines (ESG) guidelines and adoption of mitigation measures to reduce negative impacts.

Study area- A total of 40 GPs were randomly selected from 343 GPs treated under UDWDP-I (excluding 125 GPs belonging to 20 MWS under SLEM).

S N	Name of Division	Number of GPs	No of persons attain FGD
1	Bageshwar	6	138
2	Gangolihat	6	120
3	Lohaghat	6	135
4	Almora	4	109
5	Kotdwara	4	89
6	Chinyalisaur	2	41
7	Gairsain	6	125
8	Vikasnagar	6	161
	Total	**40**	**918**

Three watershed activities namely DLT, Irrigation Tanks and HYVs were chosen for the ESMF application study. To achieve the objective of the study, survey of one site for each activity in all selected GPs was done. A questionnaire (Annexure III) was also developed with relative questions and filled on the basis of focused group discussion. A total of 918 respondents in 40 GPs representing WWMC, RVC, UGs, VGs and UG were consulted for this study.

The major findings/responses from Community members present during FGD:

- 100% FGD participants are aware about ESMF through trainings and information provided by the project, prior to the formation of GPWDPS.
- 100% GPWDPs were formed by considering the ESMF safeguards.
- 100% participants expressed that such guideline was quite helpful for them to prioritise activities for planning and implementation.
- 100% FGD participants were aware about possible negative impacts of activities and necessity to take mitigation measures.
- 89% proposals for NRM activities proposed by womenfolk in Mahila Aam Sabhas, were considered in GPWDP.

- 5% proposed activities (mainly of big check dams) were changed/removed from GPWDPs according to ESMF safeguards.
- 2-3% proposal of activities, i.e. village ponds, Gabion structures and establishment of MUC were sent back to WWMC to review before appraisal from DPD office considering technical aspects especially selection of site.
- The IGA activity Goatry, which was supposed to be against the ESMF safeguards were taken up considering it to be an effective livelihood option. This activity was taken up after implementing all mitigation measures.

1.7.2 Stakeholder Consultation Workshop

A Consultation Workshop on ESMF for proposed UDWDP-II was held on 5th Feb 2013 at Watershed Management Directorate. The objective of the workshop was to deliberate on the ESCP proposed for UDWDP-II with the community members from the project area, technical experts, NGOs, scientist and PRI members. About 55 participants representing different stakeholders groups participated in the workshop. Out of these participants 10 (2 Female) Gram Pradhans,3 Van Panchayat Sarpanchs and 1 Ward Member along with 6 NGO representative, 2 Scientists and different level project staff were participated in the workshop. Feedback of participants is as follows:

- Preference should be given to Watershed Treatment Works along with livelihood activities.
- Long term policies/ solutions should be adopted, considering the climate change issue.
- Prevention measures should be adopted to check soil erosion by using stone riser technique for field bunding.
- In rainfed areas, the erosion intensity has higher due to steep slopes, so shoulder bonding should be encourage to preventing it.
- Use of micro sprinklers should be encouraged to enhance the irrigation potential.
- Diversified use of water harvesting structures constructed under projects should be ensured.
- Along with roof rain water harvesting, the water of small streams (gadhera) should also be properly used in agriculture and allied activities.
- Traditional knowledge of the local people should be conserved and documented also.

  Detailed report is annexed (Annexure-IV).

Chapter-2

ENVIRONMENTAL AND SOCIAL ISSUES TO BE ADDRESSED DURING THE PLANNING AND IMPLEMENTATION PHASES.

Based on recommendations of consultation workshops (Annexure-IV) and experiences from previous projects (Annexure - V & VI), following issues have been shortlisted which should be addressed during the planning and implementation phase of the project. The recommendations of the workshop held prior to formation of ESMF of UDWDP-I, have also been incorporated in it.

2.1 ENVIRONMENTAL ASPECTS

i Best indigenous practices should be taken for resources management to foster the local skill, employment generation and also to protect the aesthetic values.

ii To ensure the availability of water for domestic as well as irrigational use, source sustainability measures should be given top priority over any other resource development and management activity.

iii In traditional water sources (Naula), repairs should be done by using traditional wisdom (mud and stone) only. Using cement for this purpose should be prohibited, which seals the capillaries of water sources.

iv Multipurpose trees (fodder, fuel wood, fibre, fruits & fertilizer - the 5 Fs) should be planted instead of exotic species. Preference should be given to the local endemic species.

v To reduce man animal conflict, wild fruit plants, local shrubs and grasses should be preferred for plantation under forestry activities.

vi Any modern technological interventions (e.g. water lifting pumps, rope way etc.) must be installed only after proper assessment of environment friendliness of the intervention and cost benefit (effectiveness) study for its sustainability.

vii To increase income of local people, cultivation of high value plants, horticulture plantations, market linkages for agribusiness and other non-farm IGA should be promoted.

viii Organic cultivation should be promoted.

ix Use of alternative energy sources such as Bio-gas, solar devices, gharats etc. should be promoted to reduce dependence on forest for fuel wood.

x Drudgery reduction intervention should be promoted to help women folk.

For Drainage Line Treatment, the engineering structures should constructed through loose bolder/stones lying alongside the drainage line. Quarrying for stones prior to construction of any structure on a site should be strictly prohibited.

2.2 SOCIAL ASPECTS

i The weaker section and SC/ST groups should be consulted / informed about the project activities so that their livelihood opportunities are enhanced and safeguarded.

ii As women are the key persons in natural resource conservation and management in the region, their role should be pivotal in planning, decision making, and implementation and monitoring.

iii In each GP, the formation of Women Aam Sabhas and inclusion of their proposals in GPWDP should be ensured.

iv To ensure equity concerns the proposals where a large number of persons are benefited should encouraged instead where the proposals benefits a few only.

v For all types of asset creation, either individual or community land could be used for the construction purpose, with the consent & approval of the beneficiaries and Gram Panchayat. None of the lands should be donated to the project thus the right and ownership of the land will be with GP/beneficiary only.

vi Transhumant populations within the State encompass two nomadic groups Bhotiya/Anwal and Gujjars which travel through the project target area. A transhumant action plan has been developed, which will support livelihoods improvement, in particular, livestock health and extension services and assist them to improve their quality of life through project interventions. The institutional arrangement to implement the transhumant action plan includes the project staff with the support of social development facilitators. The plan also promotes cohesion with the target GPs by increasing project awareness.

2.3 BORROWER'S INSITITUIONAL CAPACITY AND SAFEGUARD IMPLIMENTATION

The Watershed Management Directorate (WMD) has built its experience of implementing environmental and social management measures in several watershed projects over the past years. Since this is a repeater project, the borrower is familiar with the Bank's social/environmental safeguards requirements having successfully implemented UDWDP I.

Under Phase I of the project the Directorate had recruited an environmental specialist at the Watershed Management Directorate, and field work was conducted by the Deputy Project

Directors based regional offices; a similar institutional arrangement is envisaged for Phase II of the project (See Figure 1 Institutional Structure of UDWDP II)

The environmental and social management measures were considered, implemented and monitored by all the project partners during preparation of the GPWDP. This was a five stage process in which initially the capacity of the village community and project staff was built to apply environmental and social guidelines during the preparation of RVC proposals and Transhumant plans. As a result RVC proposals and action plans for transhumant followed the Environmental and Social Management Framework (ESMF).

During UDWDP I the WMD supported village-level training and exposure visits for primary stakeholders. The project provided 55,500 orientation training at village and division levels, which included project's participatory approach and watershed concept, budget envelope, planning and implementation, project activities, ESMF, and financial management. In addition, more than 32,000 community members undertook exposure visits in and outside of the state. The sub-component also provided 31,465 target GP members and support staff with more technical training, including participatory rural appraisal, financial management, participatory monitoring and evaluation (PME). Key lessons learned from UDWDP 1 applicable to environment and social management planning for UDWDP II have been described in Annex VI.

2.4 APPLICABLE NATIONAL LAWS/REGULATIONS

The national, state and local environmental and social regulatory requirements that are applicable to the proposed sub projects under UDWDP II are given in this section. Table 3: Applicable Environmental and Social Laws and Regulations The implementation of the project would be in consistent with the existing legal and regulatory mechanisms specified below:

Table 3: Applicable Environmental and Social Laws and Regulations

S. No	Act / Rules	Purpose	Applicable Yes/ No	Authority
1	Environment Protection Act,1986	To protect and improve overall environment	Yes	MoEF, GoI, DoE, State Govt. CPCB, SPCBs
2	The Forest (Conservation) Act,1980	To check deforestation by restricting conversion of forested areas into non-forested areas	Yes	Forest Department, State Government and Ministry of Environment and Forests, Government of India
3	Wild Life (Protection) Act, 1972	To protect wildlife through National Parks and Sanctuaries	No	Chief Conservator Wildlife, Wildlife Wing, State Forest Department and Ministry of Environment and Forests, Government of India
4	Air (Prevention and Control of Pollution) Act, 1981	To control air pollution by controlling emission of air pollutants as per the prescribed standards.	Yes	Uttarakhand SPCB
5	Water Prevention and Control of Pollution) Act, 1974	To control water pollution by controlling discharge of pollutants as per the prescribed standards	Yes	Uttarakhand SPCB
6	Ancient Monuments and Archaeological Sites and Remains (Amendment and Validation) Act, 2010	Conservation of cultural and historical remains found in India	Yes	Archaeological Dept. GoI, Indian Heritage Society and Indian National Trust for Art and Culture Heritage (INTACH).
7	National Forest Policy, 1988	To maintain ecological stability through preservation and restoration of biological diversity.	No	Forest Department, State Government and Ministry of Environment and Forests, Government of India
8	Biodiversity Conservation Act, 2002	Federal legislation enacted by the Parliament of India for preservation of biological diversity in India, and provides mechanism for equitable sharing of benefits arising out use of traditional biological resources and knowledge.	Yes	Ministry of Environment an Forests
9	Uttarakhand Government Order #3408/X-2-2009-12(9)/2006 TC Involvement of Van Panchayat in Reserve Forest areas[1]	To involve Van Panchayat in soil and water conservation related activities within reserve forest areas.	Yes	Government of Uttarakhand

[1] Details of the Government Order are attached in Annexure XVI

Chapter-3
ENVIRONMENTAL AND SOCIAL GUIDELINES

The environmental and social guidelines would promote the ability of communities to select a package of sub-projects and activities which will not only minimize or mitigate the negative environmental and social impacts but also enhancing the positive impacts. To ensure an environmental friendly and socially acceptable watershed planning under the project, following steps should be taken

3.1 SCREENING GUIDELINES ON ENVIRONMENT AND SOCIAL SAFEGUARDS

Selection criteria for the project activities.

The Himalayan watersheds are under constant threat of mass wasting and erosion caused by depletion of forest cover, unscientific agronomic practices, hydrologic imbalance and natural calamities. So the thrust has been given to implement such activities which not only minimize the negative environmental and social impacts but also enhancing the positive impacts. To ensure it, an Environmental and Social code of Practices has been developed and annexed in this guideline (Annexure-VII). All the activities under the project should be in accordance to these codes of practices. The activities which causes negative impacts to the environment, can only be implemented after carrying out a limited Environmental Assessment (ESA) under project as listed in following Formats, 1(a) &1 (b)

Table 4 FORMAT 1 (a) –Criteria for exclusion of sub-projects/activity

Sl. No	Criteria
I	**Forests / biodiversity**
1	Activities likely to cause damage to wildlife by setting fire, injuring wildlife, or involving indiscriminate felling of trees or indiscriminate removal of plant, animal or mineral produce from sanctuaries/national park and adjoining forest area.
2	Activities likely to promote indiscriminate felling of trees.
II	**Dams**
3	Activity that involves construction of dam (existing or new) of 10 metres height or more
III	**Farming System**
4	Agricultural activities that intend to use banned pesticides, agrochemicals in WHO classes IA, IB and II **(refer list of pesticides – Annexure- X & XI)**
5	Activities that involve manufacture or sale, stocking or exhibiting for sale or distribution of any insecticide, pesticide, medicine without a licence
6	Activities that totally eliminate indigenous races of food crop
7	Activities that spread a Vector of diseases of livestock
IV	**Land / Ecosystem**

Sl. No	Criteria
8	Activities that causes pollution of water sources.
9	Activities that can cause risk of floods and damage to downstream resources
10	Activities which would require involuntary resettlement or forced acquisition of land
11	No constructions related to common activities to be taken up on land owned by vulnerable groups.
12	Activity that have any adverse impact on the indigenous people/ vulnerable families in terms of displacement or their livelihoods being affected
13	Activity that introduce/promote child labour.
14	Activity that exclude the vulnerable from the benefits.
15	Activity that involve production, storage and consumption of tobacco, drugs, alcohol, etc.
16	Activity that cause damage to cultural property, places of religious importance and restricted historical monuments.*

*Whenever there is a chance find of cultural or historical artefacts (moveable and immovable) the Department of Archaeology of the state Government, the Archaeological Survey of India will be informed. Should the continuation of work endanger the historical and cultural artefacts, the project work will be suspended until a solution is found for the preservation of these artefacts, or advice from the Archaeological Survey of India is obtained. It should be noted that Failure to report a chance find within the 48 hours of discovery, is a punishable offence under the relevant Indian legislation. Similarly, (intentional) damage to a historical or cultural artefact is a punishable offence.

Table 5 FORMAT 1 (b) Criterion for limited ESA of sub-projects/activity

Sl. No	Criteria
1	Construction of water impounding structures/ earth work with a height of more than 5 metre and less than 10 metre.
2	Construction of roads, bridge, civil works etc. that may cause destabilisation of lands.
3	Activity that limit the traditional/legal rights of indigenous people on common property resources.
4	Activity that involve use of private land and causes loss of livelihood.

3.2 PROPOSAL OF MITIGATION MEASURES FOR POSSIBLE NEGATIVE IMPACTS OF THE ACTIVITIES

At the planning phase, the possible negative impact of the proposed activities should also be considered during PRA exercises. If the WWMC proposed any activity in their GPWDP, it should be ensured that the mitigation measures for the possible negative impacts have also been proposed for implementation. With accordance to the past experiences, all the possible negative

impact and the mitigation measures thereof are listed in Annexure-VIII, which shall be properly considered and incorporated in the GPWDP during the PRA exercise.

3.3 ENVIRONMENTAL AND SOCIAL ASSESSMENT (ESA)

The ESA would be used as a tool to evaluate the possible positive and negative impacts of the proposed watershed activities. To assess all the environmental and social impacts of activities, following Format-2 should be used at the planning phase. The possible environmental (A to S) and social (T to Z3) impacts listed in **Table-6**, should be discussed by RVC and WWMC and mentioned as positive or negative in the format. The code of proposed mitigation measures as per ESCPs in Annexure-VII should also be mentioned in the format. Several experience sharing exercises and Annexure VIII could be used for this purpose.

Table 6 CODES FOR POSSIBLE ENVIRONMENTAL AND SOCIAL IMPACTS OF PROJECT INTERVENTIONS
(To be filled in Format 2, as negative or positive for each project activity)

Codes	Environment Impacts
A	Impact on Surface Water (Quality/Quantity)
B	Possibilities of Siltation in water bodies (existing/constructed)
C	Soil Erosion/Gully Formation
D	Impact on stability of Hill Slopes/chances of Landslides
E	Impact on Soil Quality
F	Soil Moisture regime
G	Impact on Agricultural Productivity (Grain/Fodder)
H	Water/Air / Noise Pollution
I	Pressure on Surrounding Trees and Vegetation
J	Forest Fire
K	Impact on Biodiversity (Flora/Fauna)
L	Impact on Aquatic Life
M	Invasion of Exotic Species
N	Impact on Rare, Threatened & Endangered Species
O	Impact on the existence of plant species of Medicinal Importance
P	Generation/accumulation of Solid Waste/ Wastewater
Q	Impact due to the use of Chemical Fertilizers/Pesticides
R	Impact (danger of extinction) to the Local Gene Pool (Plants/Crops)
	Social Impacts
S	Impact of the activity on Workload/drudgery (particularly on women)
T	Impact on availability of Nutritious Food
U	Dislocation/migration of People due to loss of traditional livelihood/ Local Labour
V	Impact on Benefits and Legal rights of vulnerable, SC/ST, transhumant and people belonging to other Marginalized Groups.
W	Use of Child Labour
X	Impact related to Insect, Pest and Wildlife Attacks
Y	Impact of the intervention on Places of Religious/Historical Importance/Monuments
Z	Social Conflicts (benefit sharing)
Z_1	Effect of the activity on Human Health
Z_2	Effect of the activity on Local Cultural/Ethical/Aesthetic Values

FORMAT 2

ENVIRONMENTAL AND SOCIAL ASSESSMENT FOR RVC AND WWMC

To be filled up by RVC and GP being facilitated by MDT/PNGOs/FNGOs during Step 2 for selecting sub-projects/activities.

Put **X** for negative impacts and **√** for positive or no negative impacts.

Sl. No	Project activities	Codes for possible environnemental impacts (Reference to Table-6)																		Codes for possible social impacts (Reference to Table-6)										Mitigation measures (Code, as mention in the ESCP-Annex-VI)	Justification for decision/Remark
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	Z_1	Z_2			
Arable land																																
	Agriculture																															
1.	Cultivation of HYVs,																															
2	Cash crops / vegetables																															
3.	Spices and condiments																															
4.	Organic farming																															
5.	Diversified agriculture																															
6.	Terrace repairs																															
7.	Vegetative field boundaries																															
	Horticulture																															
8.	Orchard development																															
9	Homesteads fruit plantation																															
10.	Rejuvenation of old orchards																															
	Agribusiness																															
11	HYVs																															
12	Poly Houses, Poly tunnel																															
13	Processing Canters																															

Sl. No	Project activities	Codes for possible environnemental impacts (Reference to Table-6)																		Codes for possible social impacts (Reference to Table-6)										Mitigation measures (Code, as mention in the ESCP-Annex-VI)	Justification for decision/Remark
Non-Arable land																																
	Forest																															
14.	Strengthening of Van Panchayat																															
15.	Afforestation																															
16.	Bamboo/Agave plantation																															
17.	Soil and water conservation works																															
18.	Assisted natural regeneration																															
.	**Silvi-pasture**																															
19.	Plantation of fodder trees/shrubs/grasses																															
20.	Fodder development																															
	Water Harvesting																															
21.	Maintenance of existing water source																															
22.	Common water harvesting structures																															
23	RWHT/ LDPE Tanks																															
	Livestock & animal husbandry																															
24.	Breed improvement																															
25.	Stall feeding																															
26.	Nutrition management																															
27.	Disease control &																															

Sl. No	Project activities	Codes for possible environnemental impacts (Reference to Table-6)																		Codes for possible social impacts (Reference to Table-6)										Mitigation measures (Code, as mention in the ESCP-Annex-VI)	Justification for decision/Remark
	health, veterinary facilities																														
28.	Stray animal castration																														
	Natural hazards mitigation																														
29	Small landslides control																														
30	Drainage line treatment																														
	Income generating activities																														
31.	NTFP/MAP based activities																														
32	Seed production and nursery raising																														
33	Food processing																														
34	Livestock based activities																														
35	Fibre/ wool based activities																														
36	Mushroom cultivation																														
37	Knitting and weaving																														
	Need based Infrastructure development																														
38	Storage facilities																														
39	Market linkage																														
40	Rural credit facilities																														
Transhumant																															
41	Temporary shelter																														
42	Water facility																														
43	Animal health care																														
44	Fodder																														
45	Migratory path																														

Chapter-4

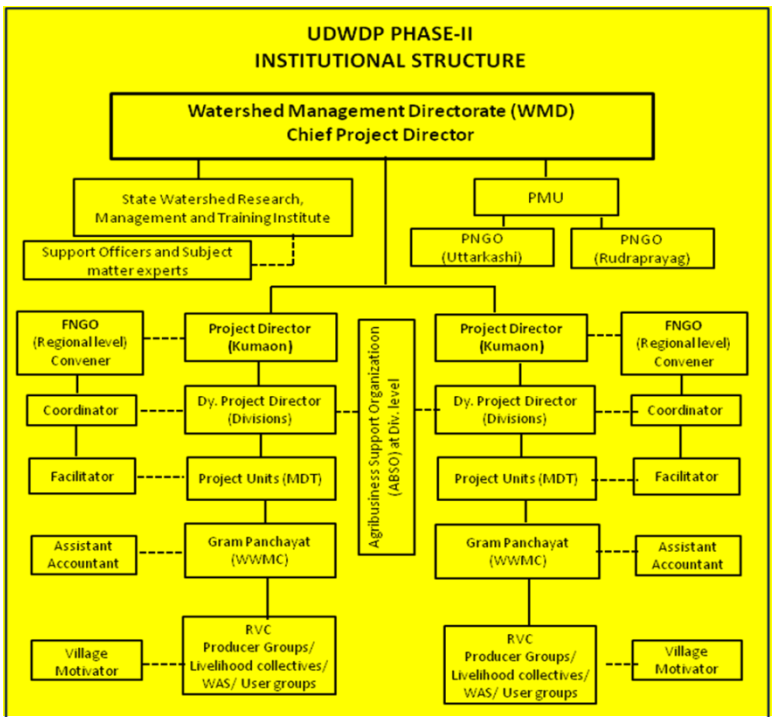
IMPLEMENTATION OF ESG

4.1 INSTITUTIONAL STRUCTURE

The responsibility for overall project implementation, coordination and monitoring will be with the WMD under the CPD. The WMD will responsible for establishing Project Directors (PDs) in each of the regions and DPDs and Multi Disciplinary Teams (MDTs) in the target districts and blocks and recruiting Partner NGOs (PNGOs) and Facilitating NGOs (FNGOS). The PNGO's and FNGO's will be responsible for implementing the communication strategy of the project, organizing the capacity building and training of stake holders on ESMF, ensuring quality of project processes, providing adequate staffing and organizing timely monitoring & learning activities.

The DPDs, each with a number of MDTs will be the key facilitators and supervisors for the planning and implementation of GPWDPs. The DPDs will be responsible for technical appraisal of the watershed plans prepared by the GPs in accordance with ESMF. The MDTs will provide project related information of the GPs and the communities facilitated planning within the Environmental and social framework of the project and provided technical guidance during implementation.

Figure 1 Institutional Structure of UDWDP II



4.2 ESG IMPLEMENTAION STAGES

The environment and social aspects to be considered, implemented and monitored by all project partners will be done in four stages from the preparation of Gram Panchayat Watershed Development Plan (GPWDP) and the action plan for the transhumant population, to the execution of project activities.

Stage 1: Sensitization of project staff, villagers (includes settled tribes) and transhumant population (henceforth referred as transhumant} regarding environment and social issues to be considered in the project.

1.a Imparting training to all village, district, state level project functionaries at initiation of the project by environmental and social assessment (ESA) cell of WMD

1.b Training to members of watershed committee-WWMC and key members of formal institution constituted under project with existing informal village level institutions (VLIs) and transhumant.

The Annexure V and VI (Past Experiences) provide for environment and social issues should be considered.

Role/ Responsibility and Outcome of Stage 1

Institution	**Responsibility**
WMD	To develop training module for ESA, arrange training on the subject and develop information, education and communication (IEC) material.
MDT/PNGOs/FNGOS	To sensitize the villagers and make them aware on environmental and social issues and provide information regarding ESA safeguards to villagers.
Village Level Institutions (WWMCof GP, RVC , VP, UG, SHG)	To accept and assimilate the ES considerations.
Outcome	
Village community is aware of ESG and capable of applying ESG to process RVC Proposals. The WMD will perform similar role on the action plan for transhumant.	

Stage 2:- Selection of sub-projects / activities at Revenue village level with the help of ESG to be included in the RVC Proposals and the action plan for transhumant and Social Assessment (ESA) for activities proposed by RVC at the Gram Panchayat level (WWMC).

Annexure VII &VIII will be used as reference for mitigation measures that may be required for negative impacts. Annexure VIII provides comprehensive list of subprojects / activities and their possible negative impacts

2.a During PRA exercise undertaken by RVC / transhumant many proposals for activities to be undertaken in the village will be put forth. Each of these sub-projects/ activities will be screened using Format 1–a (Criteria for exclusion of sub-projects/activity) & 1-b (Criteria for limited ESA of sub-projects/activity). Any activity/ sub-project falls in 1 (b) then a limited ESA will be required to be carried out before being included in RVC Proposals and the action plan for transhumant.

2.b Subprojects / activities which are selected after screening using Format 1 (b) will be subjected to ESA as per Format 2. This exercise (application of Format 2) will result in inclusion of mitigative measures to reduce or eliminate negative ES impacts of the subprojects/ activities. These sub project/activities will then be incorporated in GPWDPs.

Role / Responsibility and Outcome of Stage 2

Institution	**Responsibility**
MDT/PNGO	Facilitation and guidance regarding ESCP as whole and for individual sub-projects / activities. To advice on safeguards, IPM and Transhumants.
FNGO	To assist the MDT/PNGO with special reference to vulnerable groups like women, SC, ST, BPL, etc.
Executive committee of RVC/WWMC	To check the Proposals are compliant to ESCP
Outcome	
Draft GPWDP and action plans for transhumant follows the ESCP and conforms to ES Guidelines.	

Stage 3:- Review of Draft GPWDP and action plan for transhumant through field appraisal by DPD. The DPD and partner NGO (PNGO) may designate authorized person for the appraisal.

DPD/PNGO will certified that the ESCP guidelines has properly been followed in GPWDP (Annexure VII,VIII & IX will be followed)

3.a The financial approval to Draft GPWDP of WWMC of GP and action plan for transhumant will be granted after its review by DPD/PD to ensure that it conforms to provisions of ESA using the checklist in (Annexure IX). If the Draft GPWDP of WWMC and action plan for transhumant is found to not-conform to ES guidelines the Plan will be referred back to WWMC/MDT with observations and suggestions for review.

3.b When the Draft GPWDP/action plan for transhumant proposal is referred back to WWMC of GP /MDT and the transhumant then they will incorporate the required changes following steps 2 and 3 and resubmit the revised Plan to appropriate authority.

3.c The field appraisal of Draft GPWDP/action plan for transhumant will be completed within period of 15 days of receipt by DPD office.

Role / Responsibility and Outcome of Stage 3:

Institution	**Responsibility**
DPD/PNGO	Field appraisal of Draft GPWDP/action plan for transhumant. Make observations on Plan regarding compliance to ESG, Technical and Financial issues. Recommend the Transhumant Plan to Project Director after review.
Project Director	Approval of Transhumant Plan with observations.
Gram Panchayat	Convene meeting of Gram Sabha to approve and adopt GPWDP and Transhumant action plan.
Outcome	
GPWDP/action plan for transhumant approved in compliance with ESG.	

Stage 4 – Implementation, Monitoring and Learning of GPWDP and action plan for transhumant.

4.a On receipt of appraised Draft GPWDP the WWMC will convene a meeting of the Gram Sabha which will approve the Draft GPWDP with modification/ suggestion if any and then this adopted Plan will be termed as Gram Panchayat Watershed Development Plan (GPWDP).

4.b After the approval and adoption of GPWDP, the WWMC will implement it. For monitoring purpose, last column of Annexure VIII will be referred.

4.c The GPWDP will be implemented by the Gram Panchayat. The Gram Panchayat may associate RVC and any other institutions for implementation of activities as per the provision in Procurement Manual.

4.d The MDT/PNGOs/FNGOs will continuously assist the WWMC and other village level institutions in implementation of the GPWDP.

4.e The major processes and impacts of activities to be monitored to ensure compliance of ESG are listed in Annexure VIII (column 4).

4.f The WWMC may monitor itself or authorize the RVCs to monitor processes and impacts at village level. However the consolidated monitoring and learning (M & L) report will be furnished by WWMC to designated project authority.

4.g The observations of implementation modalities and the impact of activities on enhancing the productivity and income levels in the watershed treated by the GPWDP as approved by the provisions in Step III and IV, will be learned and the learning will be used to improve the provisions made in Step I and II.

Role / Responsibility and Outcome of Stage 4

Institution	**Responsibility**
MDT/Unit Office	Provide technical inputs/trainings for activities facilitate in record keeping; ensure participation and capacity programs are in conformity with ESG and GPWDP and the action plan for the transhumant. Facilitate WWMC and other Village level institutions in participatory monitoring and learning (M & L).
DPD/PNGO	Ensure all reporting requirements from WWMC to Project are facilitated by them. Ensure the implementation of all subprojects / activities in conformity to ESG and technical specifications laid down by the project. Ensure release of funds to WWMC as per the GPWDP schedule. Internal M & L
Gram Panchayat	Procurement, implementation, record keeping as per ESG and other manuals of the Project
Gram Panchayat, RVC , Van	Participatory monitoring and learning

Institution	Responsibility
Panchayat, UG, SHG	
External Consultant (M & E)	Impact evaluation by sample survey
Project Director	Supervision of M & L activities in the area and documentation of learning
WMD	Collation of all M & L in project area and outside project area. Documentation of learning
Outcome	
Attainment of project objectives in conformity with ESCP and ESGs and learning for improvement in future.	

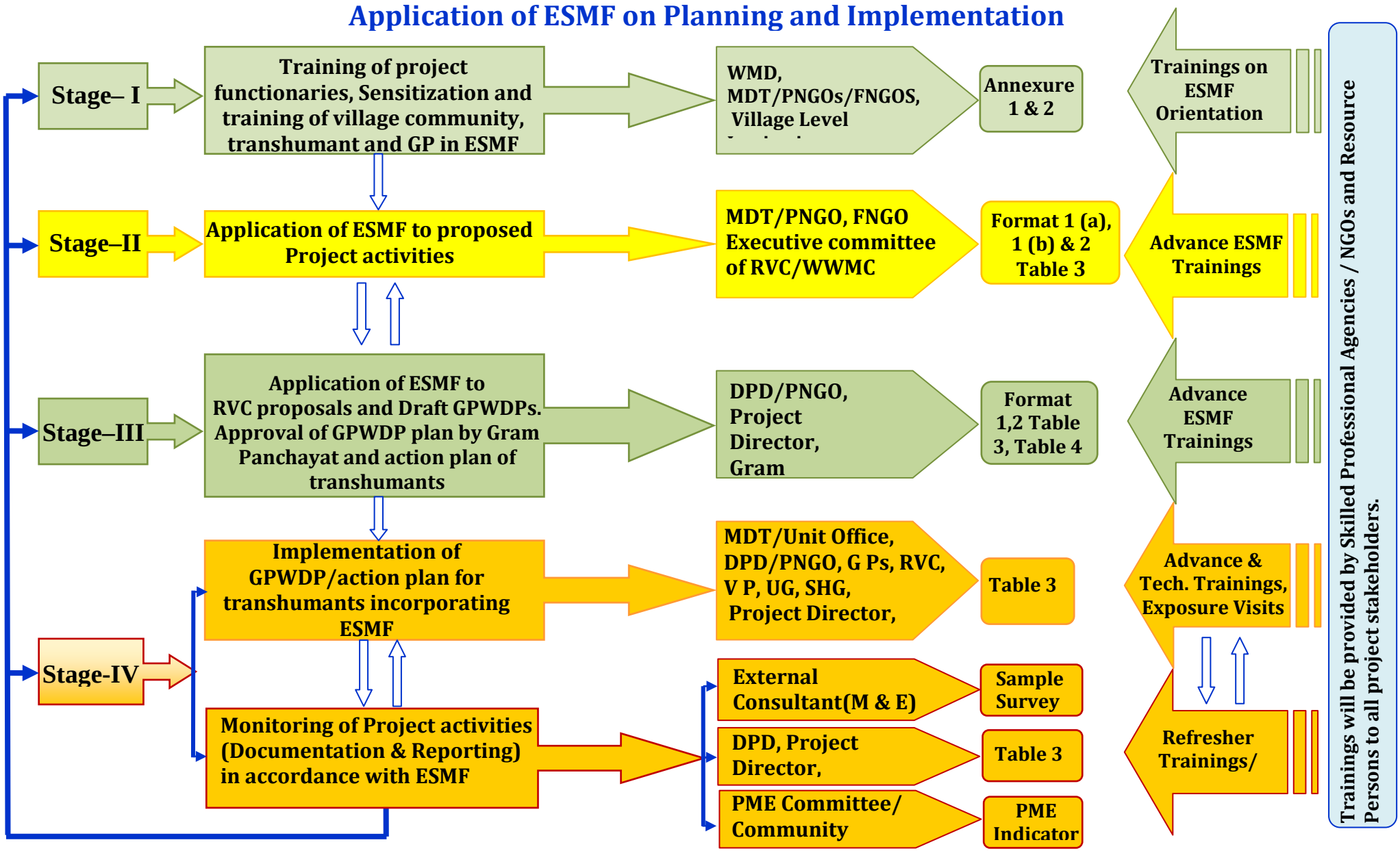
4.3 CAPACITY DEVELOPMENT FOR ENVIRONMENT AND SOCIAL MANAGEMENT

The project stakeholders will apply Environmental and Social safeguards mentioned in ESMF in all project activities during planning and implementation phases. Capacity building exercises including orientation, technical, refresher, advance trainings, workshops and exposure visits, focusing on ESMF safeguard implication and monitoring will be organised in accordance with capacity development strategy of the project. The capacity building exercises along with participatory monitoring and learning process would not only help to ensure the environmental and social safeguard application, but also develop awareness and understanding towards environmental solutions by the communities.

Capacity Building or project staff is vital in maintaining the sustainability of the project, emphasizing on knowledge development and skills building. The training programmes are to be coordinated and anchored by WMD. The contents will basically focus on the ESMF, regulatory requirements, environment and social priority issues in the project and clearly brings out the value addition and enhancement benefits of appropriate management of environmental and social issues.

Detailed trainings and workshops will be provided to field based staff at inception of the project. The timings and type of the trainings based on skills required are given in **Figure 2: Application of ESMF on Planning and Implementation**. The multidisciplinary teams in the geographical divisions, agribusiness support organisation, FNGOs, PNGOs are all provided training in the environmental and social management guidelines designed for the project.

Figure 2: Application of ESMF on Planning and Implementat



Chapter-5

MONITORING ARRANGEMENTS OF ESMF APPLICATION

ESMF safeguard application and monitoring in phase wise manner will be the responsibility of all project stakeholders. A continuous process of consultations between all stakeholders for the execution of interventions is required to find out whether the planned interventions are being executed as per the ESMF or not. If not, corrective actions need to be taken in order to realize the expected environmental and social impact. The ESMF application monitoring will also help communities as well as project team to understand the visible/possible impacts of the interventions/mitigation measures/local environmental solutions taken in accordance with ESMF. Following monitoring arrangements will be made to ensure the ESMF application.

5.1Planning Phase

The approval to Draft GPWDP of WWMC of GP and action plan for transhumant will be granted after its proper review by MDT members, DPD/PD to ensure that it conforms to provisions of ESA using Annexure IX. If the Draft GPWDP of WWMC and action plan for transhumant is found to not-conform to ESMF guidelines the Plan will be referred back to WWMC/MDT with observations and suggestions for review.

5.2Implementation Phase

5.2.1 Village level monitoring

Monitoring of ESMF safeguard application at village level will done by the WWMC by itself or will be authorize the RVCs to monitor the safeguard application processes and impacts at village level. At the village level the participatory monitoring will also done by PME team.

5.2.2 Internal project monitoring Internal monitoring of the Environmental and Social safeguards mentioned in ESMF will be done by Deputy Project Director, Regional Project Directors and WMD in accordance with the monitoring indicators mentioned in (Annexure-VIII) yearly/yearly reporting on ESMF safeguard application for the proposed activities will be carried out. The Environmental Specialist at the WMD will be responsible for overseeing the training and capacity building, monitoring, and Application of ESMF in planning, implementation and management of project activities.

The purpose of the monitoring is to collect information regarding ESMF application from the GP level, following the reporting format provided in (Annexure-XIII- a & b) of the ESMF. The information gathered from Villages Incharges and Unit Officers level will be compiled at Division Level and where applicable the PNGO Offices. At Division level the Consolidation format (Annexure-XIII-c) will be used to consolidate data.

Within the Project operational manual, and sector specific manuals for Agriculture, Horticulture and Forestry**,** environmental and social due diligence measures and reporting arrangements have been provided so that it will be carried out by the relevant agencies at each stage of the project cycle in accordance with the guidance provided in the ESMF.

The proposed project would continue to finance third-party impact evaluations (i.e., mid-term and completion), which would verify the project's key outcomes and physical achievements. The three tools - MIS, PME, and Impact evaluation - would support results monitoring and provide data for the results framework.

5.2.3 External Monitoring

ESMF safeguard application will be also monitored by external consultant on sample basis using prepared questionnaire and assessment modules which will be approved by the Watershed Management Directorate. The third party monitoring will be conducted at Mid-Term Evaluation and Final Assessment by an external agency in close collaboration with the Project Directorate.

Chapter-6

AGRICULTURE SPECIFIC SAFEGUARD STRATEGIES

Agriculture, through introduction of HYV and off-season vegetables cultivation is seen as a key intervention of the project that has direct impact on the economic status of project beneficiaries. Through ESMF guidelines the objective is to minimize or mitigate the negative environmental and social impacts and to enhance the positive impacts. Also on the other hand, to assure that impacts of the interventions made for watershed development will environment-friendly, socially acceptable and economically feasible to make them long lasting. An overview of the current status of the use of chemicals in agriculture (both Pesticide and Fertilizer) within the project districts is provided in Annexure XIV. The strategies described below will be used to facilitate that use of chemicals, where inevitable, is optimized as was done during UDWDP. (See Annexure XV for a summary of the extent of accomplishment in that project on this aspect)

6.1 INTEGRATED CROP MANAGEMENT

Integrated crop management is a holistic approach for overall management of cropping systems from seed to seed for obtaining potential yield under FIS. Integrated crop management comprises four important components. They are:

- Integrated plant nutrient management (IPNM)
- Integrated weed management (IWM)
- Integrated pest & disease management (IPDM)

IPNM is dependent on IWM, IPDM is dependent on IPNM. Likewise all the three components are interdependent and supplementary to each other. IPDM without IPNM and IWM will not produce potential yield. Hence, all our trainings, field trials and demonstrations will combine IPNM, INM, IPDM and IWM judiciously aiming at farming system intensification. Farmers' Field School will be the best way to disseminate the strategic approaches and techniques of ICM to the farmers of the project area in a comprehensive manner.

Table 7: Details on IPNM, IWM and IPDM Approaches

	Integrated Plant Nutrient Management (IPNM)	**Integrated Weed Management**	**Integrated Pest & disease Management**
About the component	Integrated nutrient management is a system / an approach; where in the overall nutrient requirement of a crop is assessed / estimated on the basis of soil test crop response (STCR), accordingly the nutrients are supplied.	Weeds are integral part of cropping system. Weeds are naturally selected and have the ability to survive under adverse condition. No-single method in the past has proved effective against weeds. IWM is a combination of mechanical, cultural, manual, biological and chemical method of weed control.	IPDM is a management tool for pests and disease management, where in mechanical, cultural, biological, chemical, use of resistant varieties, and quarantine methods are carefully combined to keep pest & diseases at below economic injure levels to obtain optimum crop yields.
Requirement of component	Assessment practices under IPNM helps farmers to know the exact nutritional requirement for a given crop. If proper IPNM practices are not followed there will be more possibilities of imbalance in the application of nutrients, as a result excess or deficit in the availability of nutrients reduces the plant's ability to utilize nutrients from the soil. It will also leads to improper metabolism of nutrients. This may result in the reduction of immunity of the plants, which may attract pests and diseases, resulting in poor yields.	Potential yields of any crop can be obtained only when the weeds are properly managed. Weeds compete for moisture, nutrients, space and they acts as hosts for many pests and disease. Therefore IWM is imperative.	IPDM is Eco & farmer friendly. Environmentally safe. Cost effective. If reduces the application of pesticides. Results are assured.
Where can it be practiced	IPNM is invariably practiced in the degraded shallow, soils resulting in poor crop yields.	IPNM the source of weeds are innumerable, for example weed can spread through FYM, soil, wind, water along with crop seeds and by birds. Therefore to manage the weeds we must select well-decomposed weed seed free compost. Before sowing, after sowing, during crop period and after harvesting, weeds shall be controlled. Only certified seeds / planting materials, seeds shall be	IPDM will be practiced in nurseries and main field, pre sowings to post harvesting storehouses. Example: - Granaries, exports of planting and seed materials.

		used.	
When can it be practiced	IPNM has to be planned on scientific basis, from the first day of land preparation, sowing to harvesting	Right from preparation of land i.e. pre-sowing, sowing, selection of seed and application of FYM, during the crop stage, at the time of harvest, after harvest, after harvest, during the time of threshing, processing and packing.	IPDM will be practiced from seed to seed, which includes pre- sowings to post harvesting of the crop.
Who can adopt the practice	It is joint responsibility of project staff and other project stakeholders i.e. WWMC, RVC, FIG members/farmers.	Extension staff, quarantine officers and farmers.	Farmers, extension workers, scientists, traders, quarantine officers, etc.
How is the practice adopted	By sensitizing area groups, creating awareness to farmers through publicity propaganda, organizing communities and training's. Demonstrations can be conducted on the lines of farmers field school (FFS). Application of nutrients based on STCR results. All decisions are taken by farmers in the fields with the help of extension staff, during the period of demonstration from pre sowing to post harvest (seed-to seed). Farmers can actively be involved in the field and they record all the observations and maintain the records during demonstration period.	Creating awareness among the farmers (users groups)by publicity, propaganda, and organizing communities. IWM shall be practiced through demonstrations on the lines of FFS.	The first step involved in IPDM planning is to sensitize the facilitators i.e. extension staff and the farmers in the watershed areas. This will be done by organizing Farmers Field Schools.

6.1.1 Farmers' Field School (FFS)

Farmers' Field School has proved as the best way to demonstrate IPM. It is a non-formal type of educational learning situation wherein the participants will be able to acquire the skills and knowledge of integrated pest management through the integrated adoption of production technology in raising a healthy crop. At the end of the training farmers will –

- Become experts in their own field for arriving at right decision for pest management.
- Be able to conserve the defenders (natural enemies) in their field.
- Observe the crop regularly.
- Be able to grow healthy crop.

6.1.2 Bio-fertilizers:

Bio-fertilizer is a vital component of integrated nutrient supply system in establishing high yield, high quality and high returns agriculture. Bio-fertilizers should have broad-spectrum adaptability, nitrogen fixation, phosphorus solubilization and potassium release ability. The yield increase rate by bio-fertilizers is 12-24% crops, 14-40% vegetables, 15-48% fruits.

Nitrogen fixation	The nitrogen fixing microbes in bio-fertilizers can transform molecular nitrogen in air (78-80%) which accounts to approx. 5300 tones into ammonium nitrogen (NH_4-N) and to supply plants for uptake and utilization. This is the mechanism of biological nitrogen fixation. These nitrogen fixing microbes combine and inhabit ate on the surface of plant roots and function as nitrogen fixation through the photosynthesis in leaves. These are of two types 1. *Rhizobia species* for legumes and pulse crops, 2. *Azotobacter* and *Azospirillum* for cereals, grasses, vegetables, oil seed, fruits and flowering plants.
Phosphorus solubilizers	Phosphorus solubilizers are also the biofertilizers which transform non-soluble (insoluble) and soil fixed phosphate into soluble phosphorus by utilizing the bio-acids which are produced from microbial fermentation processes. A number of P solubilizing organisms as bio-fertilizers available are PSB, phosphatica contain *Pseudomonas striata, Aspegillus awamoori* etc.

Bio-fertilizer use in crops: Pulse crops

Pea	Use *Rhizobium* culture @ 24-30 g/kg seed, also use phosphorus solubilizer (*Bacillus polymyxa* or *Pseudomonas striata* or both mixture)@ 5 kg/ha as a soil application.
Mung and Urd	25-30 g/kg seed as seed treatment. For PSM use 5 kg PSM per ha as soil application.
Soybean	25-30 g/kg seed treatment + 5 kg per ha of PSM as soil application is recommended.

Frenchbean and Rajmah	30 g/kg seed treatment + 5 kg/ha of PSM as soil application.
Cowpea	25 g/kg seed treatment + 5 kg/ha of PSM. as soil application.

Bio-fertilizer use in crops: Horticultural Crops

Citrus, Apple, Plum, Apricot, Pear, Peaches, Almond and Walnut	Mix *Azotobactor/Azospirillum* @ 10 kg and PSM @ 5 kg/ha with FYM/compost mix nicely in compost pit and fill the pit (0.75x0.75x0.75m) with the mixture of compost: soil (1:1).
Ginger and Termeric Colocassia	i) Use *Azotobactor* and *Azospirillum* in 1:1 ratio @ 5 kg/ha and 5 kg/ha PSM as soil application. ii) Prepare a solution of *Azospirillum* 2 kg and 2 kg PSM in 15 litter of water and dip the rhizome in the solution for 10-15 minutes and plant the treated rhizome in the evening.

Bio-fertilizer use in crops :Vegetable crops

Cabbage, Cauliflower, Tomato, Brinjal, capsicum and chillies	Use 10 kg/ha *Azospirillum* and 5 kg/ha PSM as soil application in furrows or broadcast. Prepare solution of 1 to 1.5 kg *Azospirillum* + 0.5 kg PSM in 5 litter of water. Dip the roots of seedlings in solution for 5 minutes and transplant.

6.2 INTEGRATED PEST MANAGEMENT (IPM)

Pest management is an ecological matter and has much relevance in the context of highly fragile ecosystem in the Uttarakhand hills. Over-reliance on the use of synthetic pesticides in crop protection programs has resulted in disturbances to the environment, pest resurgence, pest resistance to pesticides, and lethal and sub-lethal effects on non-target organisms, including human's world over. These side effects have raised public concern about the routine use and safety of pesticides. Therefore the farmers are required to manage their land with greater attention to direct and indirect off-farm impacts of various farming practices on water, soil, and wildlife resources. Thus, reducing dependence on chemical pesticides in favour of ecosystem manipulations is a better strategy for farmers of the region. Successful IPM is based on sound farmer's knowledge of the on-going agro-ecological processes of the farming environment; such

farmers should therefore be technically sound to make decisions on the most appropriate management strategies to apply at the specific period of crop development.

To manage serious outbreaks of insect pests, farmers should be given First and Prime priority to biological/Cultural method of IPM over Mechanical control method. Subsequently the use of Chemical methods will be only last and ultimate priority and only, if crop loss is beyond ETL.

6.2.1 Criteria for Pesticide Selection and Use

i. The procurement of any pesticide in a Bank- financed project is contingent on an assessment of the nature and degree of associated risks, taking into account the proposed use and the intended users. with respect to the classification of pesticides and their specific formulations, in reference to the World Health Organization's Recommended Classification of Pesticides by Hazard and Guidelines to Classification. The following criteria apply to the selection and use of pesticides in,

   (a) They must have negligible adverse human health effects.

   (b) They must be shown to be effective against the target species.

   (c) They must have minimal effect on non target species and the natural environment. The methods, timing, and frequency of pesticide application are aimed to minimize damage to natural enemies. Pesticides used in public health programs must be demonstrated to be safe for inhabitants and domestic animals in the treated areas, as well as for personnel applying them.

   (d) Their use must take into account the need to prevent the development of resistance in pests.

ii. It is required that any pesticides be manufactured, packaged, labeled, handled, stored, disposed of, and applied according to standards acceptable to the WHO. Formulated products that fall in WHO classes IA and IB, or formulations of products in Class II, if (a) lacks of restrictions on their distribution and use; or (b) they are likely to be used by, or be accessible to, lay personnel, farmers, or others without training, equipment, and facilities to handle, store and apply these products properly are not permissible in the project.

6.2.2 Objective &Aim of the Pest Management Plan

The purpose of this document is to describe a Plan by which the project will endeavour to promote and support safe, effective, and environmentally sound pest management in agricultural interventions undertaken under UDWDP. The plan further presents components to strengthen such capacity.

The Plan promotes the use of biological and environmental control methods and the reduction in reliance on synthetic chemical pesticides. The Plan addresses pest management issues in the context of the project's environmental assessment.

6.2.3 The World Bank Operational Guidelines

The World Bank & IFC Pesticide guidelines aims to ensure that the pesticide

- Must have negligible adverse human health effects
- Should be effective against target pests and minimal effect on non target species
- Development of pest resistance to be kept in view
- Public health pesticides must be safe for inhabitants and animals

Integrated pesticide management specifically identifies the following as the key in pest control.

- A categorical preference for bio control methods along with institutional and capacity building for the same.
- Reducing reliance on synthetic chemical pesticides and only if approved by IPM approach.
- Does not permit under any circumstance the use IA, IB and II classified pesticides. Listing of these chemicals and provided by the World Health Organization is given at the end of the report.
- Recommends the use of Participatory IPM along with specific investment components for the same.
- The permissible pesticides under project (WHO's category-III) are listed in Annexure-XI. But even these must be used as part of the IPM strategy.

6.2.4 Key Aspects

Four key aspects must be kept included in implementing the pest management plan.

i. It must comply with World Bank Operational policy 4.09.The basic tenets governing the Operational policy has been presented earlier.

ii. Pest control strategy must promote the use of biological or environmental control methods and reduce reliance on synthetic chemical pesticides. If there are strong factors needing the use of synthetic chemicals then they must belong to only WHO class III category. The control of pest populations should be through IPM approaches, such as biological control, cultural practices, and the development and use of crop varieties that are resistant or tolerant to the pest. This should be built through participatory technology development using farmer's experience and knowledge and furthered through the farmer field school approach. IPM is also the strategy adopted by the Govt. of UK. and its expertise is available both in the extension wing of the Agriculture Dept. and the various research, training and agriculture centers in UK.

iii. As pest management strategy could affect agriculture or public health the screening process must ensure full compliance with Bank safeguards. It must address not only the farmer but also workers involved in various pesticide operations. It must addresses not only the farmer but also workers involved in various pesticide safeguards. The task of the screening process must be to ensure that UDWDP-II interventions do not contravene the Bank's safeguard policies. Addressing this aspect and the effectiveness in safeguarding the Bank policies on pesticide management will depend on the capacities and knowledge of those undertaking and supervising the screening process. Thus those involved in this must be selected based on clear criteria and their skills upgraded through training and capacity building along with a monitoring framework. As the project would lead to intensification of cropping pattern, the audit process must look at the cumulative impact on soil, water and air and ensure that there are no negative impacts and the mitigation measures are in place and effective.

iv. More pro-active role in promoting healthy plants and safe environment. Healthy plants will come from adopting Integrated Plant Nutrient Management(IPNM) and a safe environment by encouraging projects that promote and advocate organic and non-pesticide farming and the products and technologies that encourage and facilitate their adoption, so that IPM will succeed in not only reducing the application of pesticides but eliminate the same without reduction in yields.

6.2.5 Pesticide Management Plan

The other aspects to be considered in the screening process are:

- Selective against target pests
- Safe for beneficial species

- Active for about 4 weeks
- Weather and u/v proof
- No toxic residues
- Safe for humans and livestock

The project will provide help to resource persons and training personnel for TOT activities for IPM. It could also provide crop wise IPM materials and advice on the conduct of the GP level farmer's training.

IPM focuses on participatory technology development and not the conventional agriculture extension and advice to farmers. Therefore the project IPM personnel need to have capacities in participatory methods and enabling the farmer as well as GP's. Several agencies, govt. and non-govt. organizations have expertise in developing the IPM professional and their list is appended. Trained IPM professionals are available in the Govt. and the NGO sector. Many big corporations provide manuals for safe use of pesticides especially in mixing, dosage, application and spraying. These resources will be used for undertaking TOT in IPM. As IPM is not optimal in its effectiveness we need the TOT must include Integrated Nutrient Management (INM) in the syllabus.

The division level project authority could identify specific crops and ways to reduce pest incidence and increase the effectiveness of the control measures. Holding crop specific workshops to tackle high incidence and high resistant pests involving the department of agriculture, scientists and NGO's will help come up with specific measures that would be taken to reduce the overall use of pesticides and enhance its effectiveness.

Promoting Non-Pesticidal Management (NPM) for controlling pests is the only long term way to reduce farmer dependence on pesticides. The project works with the POP which cannot afford these costly inputs. By reducing the share of pesticides in the input costs, which are high, will serve the basic objective of the project. Further once the landscape is used to pesticides, reversing it is difficult and takes a very long time. Therefore a more rational and sustainable approach would be to encourage NPM in crops, especially those grown in dry land conditions. Hence training in NPM must be also being built into IPM capacity building. A proactive approach recommending crop wise NPM approach must be promoted in the GPS & Farmers. Exposure visits of farmers to NPM practice's is a useful way of strengthening the farmers & village organizations.

6.2.6 IPM Options

IPM involves a range of methods to control pests (a) reactive options such as—physical and mechanical methods, biological and chemical control. A sudden withdrawal of pesticides will invariably bring down the yields drastically which the farmer will ill afford. IPM recommends a gradual withdrawal of pesticides allowing time for both the plants (and the farmers) to adjust and build up internal strength, reserves and resilience. However the long term goal should be to promote (b) proactive options to grow perfectly good crops without the help of chemical pesticides. Crop rotations and creation of habitat for beneficial organisms permanently lower the carrying capacity of the farm for the pest. Cultural controls are also considered as proactive strategies, which includes maintaining healthy, biologically active soil (increasing below ground diversity), maintaining habitat for beneficial organisms (increasing above ground diversity) and using appropriate plant cultivars. Some of the ways that will be used to maintain biodiversity of the farm would include, increasing genetic diversity, species diversity, crop rotations, multiple cropping, inter cropping, use of disease free seed and planting material, use of resistant varieties, sanitation, plant spacing, altered planting dates, optimum growing conditions, use of mulch material, etc.

- Physical and mechanical methods are the oldest form of pest control involving devises to trap and kill pests-traps, insect screens, nets, baits, and plant guards.
- Biological control methods involve the use of parasites, predators, pathogens to control pests. In natural biological control the first step would be to assess populations of beneficial organisms and their interaction within the ecosystem. If provided with adequate habitat these organisms will make significant contribution to pest management. Habitat enhancement for beneficial insects, for example, focuses on the establishment of flowering annuals and perennials that provide nectar and pollens during certain parts of life cycle of insect. Habitat and food for beneficial insects and other beneficial should be a component of the IPM programme.
- Natural methods include use of bio-sprays, some physical components of the environment, such as temperature, humidity or light, detrimental to pests are exploited through tillage operations, soil solarization, plastic mulching, etc. The effectiveness of both proactive and active management approaches would depend on correct identification of pests.
- Use of chemicals remain the last resort in the IPM programme and may be used only when other measures, such as biological or cultural controls, have failed to keep pest populations

from approaching economically damaging levels. . If they must be used, they should be least toxic and should not harm the non-target organisms.

- Chemical control includes the synthetic pesticides widely in use today. Most of them work by absorption (contact poisons) or ingestion (stomach Poisons). Longer lasting pesticides are described as residual.

IPM is a holistic system that reduces damage caused by pests to tolerable levels through a mixture of all the above techniques. IPM does not recommend the use of chemical control except as a last resort and even then only the least toxic chemical is used.

6.2.6.1 Operational Aspects of IPM

- Growing a healthy crop involves the right varietals selection; appropriate seed bed management, plant nutrition, and plant nutrition, and plant physiology, water and weed management.
- Optimize natural enemies recognize beneficial insects in the field, learning insect population dynamics, life cycles, and food webs; understanding the effects of pesticides on beneficial populations, promoting survivorship of predators through habitat management and making local reference collections.
- Observe fields weekly for damage symptoms, changes in insect populations, to evaluate plant growth and physiology, relationship between plant stages and insect populations, effects of weather conditions, and water and nutrient management.
- Farmers as experts: agro-system analysis and decision making based on information directly observed and collected leads to farmers to make sound conclusions crop management decisions.

6.2.6.2 Awareness building

Awareness building on safe use among farmers and agriculture workers is another instrument that must be used for implementing the PMP in the project. This is an essential component in the GPS. Expert caters to the field staff and does not reach the farmers who have the highest exposure to pesticides and are compelled by poverty to work in unsafe conditions. All supports to pesticide sprayers and equipment must include making available a protective gear. Pamphlets and posters on safe use of pesticides which deal from purchase, transport, storage, application to disposal must be provided to village organizations. In high pesticide use areas, cultural expressions like folk songs must be provided to village organizations.

A major impact of pesticide usage is on water. Reducing pesticide usage by adopting IPM/NPM and permitting only class III pesticides, while substantially reducing pesticide usage, the threat to water contamination reduction is possible. Educating the community not to spray pesticides during or just before a rain must be included in the awareness material. Monitoring the health on the people, especially workers, on a sample basis in high pesticide use area would be another task taken up by the project.

6.2.7 Pesticide Management in water

Drift of pesticides must be avoided when spraying. They should not be applied when rain is imminent and the users should follow the direction given in the container for pesticide handling safety precautions, application rates and proper disposal. To reduce contamination of surface water and ground water from pesticides:

Evaluate the pest problems, previous pest control measures, and cropping history;

Use integrated pest management (IPM) strategies that:

a. Apply pesticides only when an economic benefit to the producer will be achieved
b. Apply pesticides efficiently and at times when runoff losses are unlikely
c. When pesticide applications are necessary and a choice of registered materials exists, consider the persistence, toxicity, runoff potential, and leaching potential of products in making a selection
d. No use of pesticide belonging to category 1 &2 as classified in the pesticide code

The goal of this management measure is to reduce contamination of surface water and ground water from pesticides. The basic concept of the pesticide management measure is to foster effective and safe use of pesticides without causing degradation to the environment. Pesticide Management Plans (PMP's) identify;

- Identify areas vulnerable to pesticides;
- Monitor source water for pesticide contamination;
- Prevent pesticides from reaching ground water;

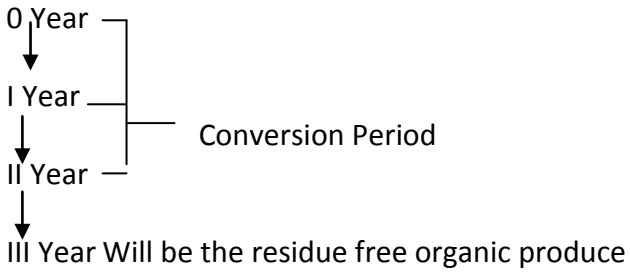
- Respond to pesticide detection.

6.2.8 IPM Module for Main Crops

- Although the bio-pesticides and bio-agents are provided for the control of various pests, however, some of them are not effectively checked. To control these, some of the safe pesticides are recommended wherever necessary.
  - To minimize the infestation of insect, disease, weeds, etc. in practice:
  - Summer ploughing.
  - Avoid mono cropping: Use of bio-fertilizers and bio-pesticides.
  - Insect/disease resistant varieties.
  - Use of trap crops to minimize the insect damage.
  - Solarisation of nursery beds to minimize the disease incidence in seedlings.

6.2.9 Pesticide Residues

- Uses of pesticides in upper and mid hills region are almost negligible except in some fruits and off-season vegetables.
- To monitor the pesticide residues in the cereals, pulses, oil seeds, vegetables and fruit crops establishment of a residue analysis laboratory is essential in the state of Uttarakhand under the supervision of GB Pant University of Agriculture & Technology Pantnagar. Till that time residue will be tested in IIT Roorkee or wherever the residue testing facility is available.
- Under the Directorate of Organic Seed Certification of Uttarakhand, a certification plan for the farmers interested to grow crops organically has been started in the following form to make their land and crop produce pesticide residue free:



- Directorate of Organic Seed Certifications and Uttarakhand Organic Commodity Board, as well as Agricultural University (Hill Campus, Ranchauri and Pantnagar) has already developed a training module for farmers.
- Project staffs along with the farmers have already been sent for exposure to within and outside the state where organic farming is under practice.

6.2.10.Use of Plastic

- To minimize the use of pesticides as seed treatment to reduce the incidence of disease in nurseries, use of specific plastic sheet will be recommended for soil solarization.
- Plastic sheets will also be helpful in moisture conservation as mulch.
- Use of plastic in the form of poly tunnels and poly houses under adverse climatic conditions. This will also help in growing insect and disease free seedlings, off season vegetables and flowers to improve the economy of farmers. Thus minimizing the pesticide application.

6.2.10.1Disposal of plastic waste:

In the project area the plastic waste is proposed to be sent to be plastic recycling and processing plants available in nearby vicinity in accordance of Waste Management Guidelines of WMD (Annexure-XII).

6.2.11 Areas of Competence:

1. Prevention – Indirect measures

2. Observation- Decision tools

3. Intervention – Direct measures.

6.2.11.1 Prevention – Indirect Measures

A- Location

- Selection of place away from high humidity crops.
- Away from crops being alternate host for the major pest
- Tomato from Sunflower and Gram.
- Avoid fields having soil borne disease, pests, nematode infestation, etc.

B- Crop rotation

- No mono cropping.
- Crop rotation with legumes *(Cowpea, F. Beans, Peas).*
- Crop rotation of shallow and deep rooted crops (Onion and capsicum followed by cucurbits)
- Rotation of soil building crops with exhaustive crops (Potato followed by cabbage)

C- Selection of varieties/hybrids

- Use of resistant/tolerant varieties
- Use of Area, Crop and Season specific varieties.
- Use of varieties with wider genetic base.

D- Crop husbandry and hygiene

- No crop residues in the field
- Removal of affected plant parts and burying under the ground
- Avoid use of harmful waste as manure.
- Improperly decomposed manure.
- Avoid use of untreated sewage water for irrigation

  Practice proper weed management.

E- Fertilization

- Increased use of organic manure.
- Use of balanced fertilizer.
- Practice fertilizer placement (Nutrient use efficiency and avoiding run off)
- Increased use of fertilizer mixtures.
- Minimize use of urea.
- Increased use of foliar fertilizers.

F- Irrigation

- Avoid flat irrigation
- Avoid excessive irrigation.

- Practice raised bed/furrow-ridge cultivation/irrigation
- Never submerged bed/ridge tops during irrigation.
- Use more of drip/sprinkler irrigation systems.

G- Border/Trap crops

- Mustard (Cabbage, Cauliflower)
- Marigold (Tomato)
- Maize, Cowpea (Cotton)

G- Harvesting and storage

- Harvesting at marketable stage.
- Removal of affected produce in the field.
- Sorting/grading of produce.
- Proper packing and transport
- Proper curing and storage. (Onion, Garlic, Potato, Pumpkin)

6.2.11.2 Observation – Decision tools

A- Crop Monitoring:

- For appearance of insect, pest and disease proper know how will be provided to the farmers through training, exposure visit and identification, so that, the farmer will identify the beneficial insect as well as harmful insect.
- To decide the critical stage of insect, pest and disease according to economic injury level (EIL). Farmers will himself decide to use the control measures. This will also possible through training, exposure visit, and identification of insect, pest and disease.

B- Whole area management

- Co-operative management of pests/disease

6.2.11.3 Intervention – Direct measures

A- **Cultural and physical control**

- Summer deep plugging
- Avoid monoculture.

- Optimum plant densities
- Avoid high nitrogenous fertilization]
- Avoid excessive irrigation

B- Pheromones

- Traps
- Lure

C- Biological control

(i)- Parasites

- Trichogramma
- Chrysoperla

(ii)-Predators

- Spiders
- Coccinellids
- Jaggery (Gurh)

(iii)-Uses of Bio-pesticides

- BTs (bacteria), Beauveria (fungus), Metarrhizium (fungus), Verticillium (fungus) and Nomuraea (nematode)
- Neuclear Polyhydrosis Viruses (NPVs), Granulosis Viruses (GV),Trichoderma (fungus) and Pseudomonas (bacteria)
- Use of Botanical Pesticide (Neem, Karanj, Chillies, Garlic)

D- Chemical Control

- Only relatively ecologically safe chemical pesticides
- Change of chemicals at each spray
- Use of recommended dose of chemical

  Critical time of spray.

6.2.12 The Approach of IPM:

The approach of IPM is to encompasses the application of pesticides to manage serious outbreaks of insect pests only on a need basis or to limit the predicted outcome infestations.

Our priorities will be in the following order:

i) Biological method.

ii) Mechanical method.

iii) Chemical method.

Priority wise various control methods of IPM has been described in the following tabular form:

Procedure	**How it will be done**	**Remarks**
Biological	Conservation of all natural enemies & bio agents of all the harmful insect & pests eg. Birds, Parasites & pathogens, As these are farmer's friend, therefore all these are to be conserved. Use of parasites • Trichogramma Chrysoperla Use of predators • Spiders • Coccinellids • Jaggery	First and Prime priority will be of biological method of IPM.
Cultural	• Avoidance of monoculture in large belts • Improved disease resistant varieties. • Summer ploughing. • Optimum plant densities. • Avoiding excessive irrigation. • Avoiding high nitrogenous fertilization. • Trap crops	-
Mechanical	• Damage/Destroy all the eggs of the insect. • Destroy any material infested by insect, pest and diseases.	Second priority
Chemical	• If the loss is beyond ETL then only we will go for chemical control, and here only safe chemicals will be used.	This will be only last and ultimate priority and only, if crop loss is beyond ETL.

6.2.12.1 Strategy for Adoption:

Participants are selected through farmer group meetings, after formation they meet once a month for 4-5 hours in the field for the whole cropping season. The IPM provides an intensive opportunity for the farmers to master the basic skills that will enable them to make informed, confident field management decisions. After IPM farmers master the basic principles to field ecology in one crop they will extend it to other crops.

Pest Management needs to be integrated with resource mapping and inter- linkages established between different watershed activities with priorities given to those activities with clear environmental benefits.

I- Use of Bio-pesticides

- *Bacillus thuringiensis, Beauveria, Metarhizium, Verticillium & Nomuraea.*
- Nuclear Polyhedrosis viruses (NPV) & G.V.
- *Trichoderma, Pseudomonas*

II- Use of Botanical Products:

- Neem/Karanj/Chillies/Garlic

III- Need Based Use Of Chemical Pesticides

- Only relatively ecologically safe chemical pesticides.

IV- Storage:

- Pesticides should be stored in a separate room under lock and key and not in the living room or cattle shed where household animals, women and children are likely to come into contact with them
- They should not be stored near the naked flame; nor where the electrical wiring is bad.
- Do not eat, drink or chew or smoke tobacco in the room where pesticides are stored.

V- Transportation:

- Pesticides should not be transported along with food or animal feed, passengers or livestock.
- They should not be transported with fertilizers and seeds.

VI- Timings:

- Pesticides should be use only if the crop damage level raised up to 50-60 percent.
- Pesticide application should not be done during rain showers.
- Pesticide application should be done 30 days prior to harvesting because the absorbed chemical takes time to dissolved and it should be left within plant parts.

6.2.13 Safe use of pesticides*

- Identify the pest and ascertain the damage done.
- Use pesticide only if it has exceeded the Economical Injury Level.
- Use only the recommended pesticide which is the least toxic.
- Read instructions manual of the pesticide and equipment .
- Check the spraying equipment and accessories which are to be used.
- Ascertain that all components are clean, especially filling and suction strainer, sprayer tank, cut off device and nozzle.
- Replace worn out parts such as 'O' ring, seal, gasket, worn out nozzle tip, hose clamps and valves.
- Test the sprayer and ascertain whether it pumps the required output at rated pressure. Check the nozzle spray pattern and discharge rate.
- Calibrate the sprayer. Set spraying speed and nozzle swath by adjusting spray height and nozzle spacing.
- Make sure that appropriate protective clothing is available and is used.
- Train all concerned with the application and also understand the recommendations. Ensure that soap, towel and plenty of water is available.
- Pesticides should be kept in a dry, locked store. Keep away from Children
- Take only sufficient pesticide for the day's application from the store to the site.
- DO NOT transfer pesticides from original container and packing into the containers.
- Recheck the use instructions of pesticide and equipment.
- Make sure pesticides are mixed in the correct quantities.
- Wear appropriate clothing.
- Avoid contamination of the skin especially eyes and mouth.
- Liquid formulation should be poured carefully to avoid splashing.
- Do not spray in high wind, high temperature and rain.
- Avoid drift by selecting proper direction of spraying and also holding nozzle and boom at a proper height.

- Start spraying near the downwind edge of the field and proceed upwind so that operator moves into unsprayed area.
- Never eat, drink or smoke when mixing or applying pesticides. NEVER blow out clogged nozzles or hoses with your mouth.
- Follow correct spray technique. Spray plant crop thoroughly by operating sprayer at correct speed and correct pressure.
- Never allow children or other unauthorized persons to be nearby during mixing. NEVER leave pesticides unattended in the field. Never spray if the wind is blowing towards grazing livestock or pastures regularly used.
- Remaining pesticides left in the tank after spraying should be emptied and disposed off in pits dug on wasteland.
- Never empty the tank into irrigation canals or ponds.
- Never leave unused pesticides in sprayers. Always clean equipment properly. After use, oil it and then keep away in store room.
- Do not use empty pesticide containers for any purpose.
- Crush and bury the containers preferably in a land filled dump.
- Clean buckets, sticks, measuring jars, etc. used in preparing the spray solution.
- Remove and wash protective clothing and footwear. Wash yourself well and put on clean clothing.
- Keep an accurate record of pesticide usage.
- Prevent persons from entering treated areas until it is safe to do so.
- Mark the sprayed plots with a flag.

(* Safe use of pesticides- Source: TNAU Agritech Portal, Tamilnadu Agricultural University, Coimbatore)

Chapter-7

GRIEVANCE REDRESSAL MECHANISM

The project places special emphasis on transparency, accountability, openness and disclosure of information to the community. In keeping with above principles, wide spread disclosure of information through wall writings, paintings, awareness generation campaigns, radio programmes, publications, village level workshops, Samvad workshops have been carried out. Besides above, website- www.wmduk.gov.in and www.gramya.in have been developed for information dissemination regarding the project. The dedicated project website www.gramya.in is updated daily with the latest monthly physical and financial status of the project.

A citizen charter for WMD has been prepared and as per the RTI Act, the Public Information Officer at State, Division, Unit and Gram Panchayat Level have been designated and information displayed. At block level and district level, information regarding the areas/ Gram Panchayats selected under project has been widely displayed.

In keeping with the guiding principles of transparency, accountability and openness, a grievance redressal mechanism in UDWDP-II has been put in place. Since the Gram Panchayat will be the project implementing agency, grievance redressal mechanism both within and outside Gram Panchayat has been adopted.

Following administrative and legal mechanisms for redressal of grievances are available for any citizen, institutions, group of individuals representing project area or outside.

7.1 WITHIN THE GRAM PANCHAYAT

Following mechanism for early resolution of grievance are available with in Gram Panchayat.

1. **Provisions of Uttarakhand Panchayat Raj Act:** The Provisions available for grievance redressal as per the Uttarakhand Panchayat Raj Act can be invoked.

2. **Complaint box-** Village/ Gram Panchayat level written grievances, if any, will be collected in a sealed box kept in a public place in each village with in a Gram Panchayat. This complaint box would be opened once every month on a fixed date in the presence of all stakeholders and project functionary. The specific complaints/ grievances would be discussed and steps will be taken to resolve them with in 15 days. In case the

community or the members of the community are unable to resolve them, the next administrative unit will receive the complaint for redressal.

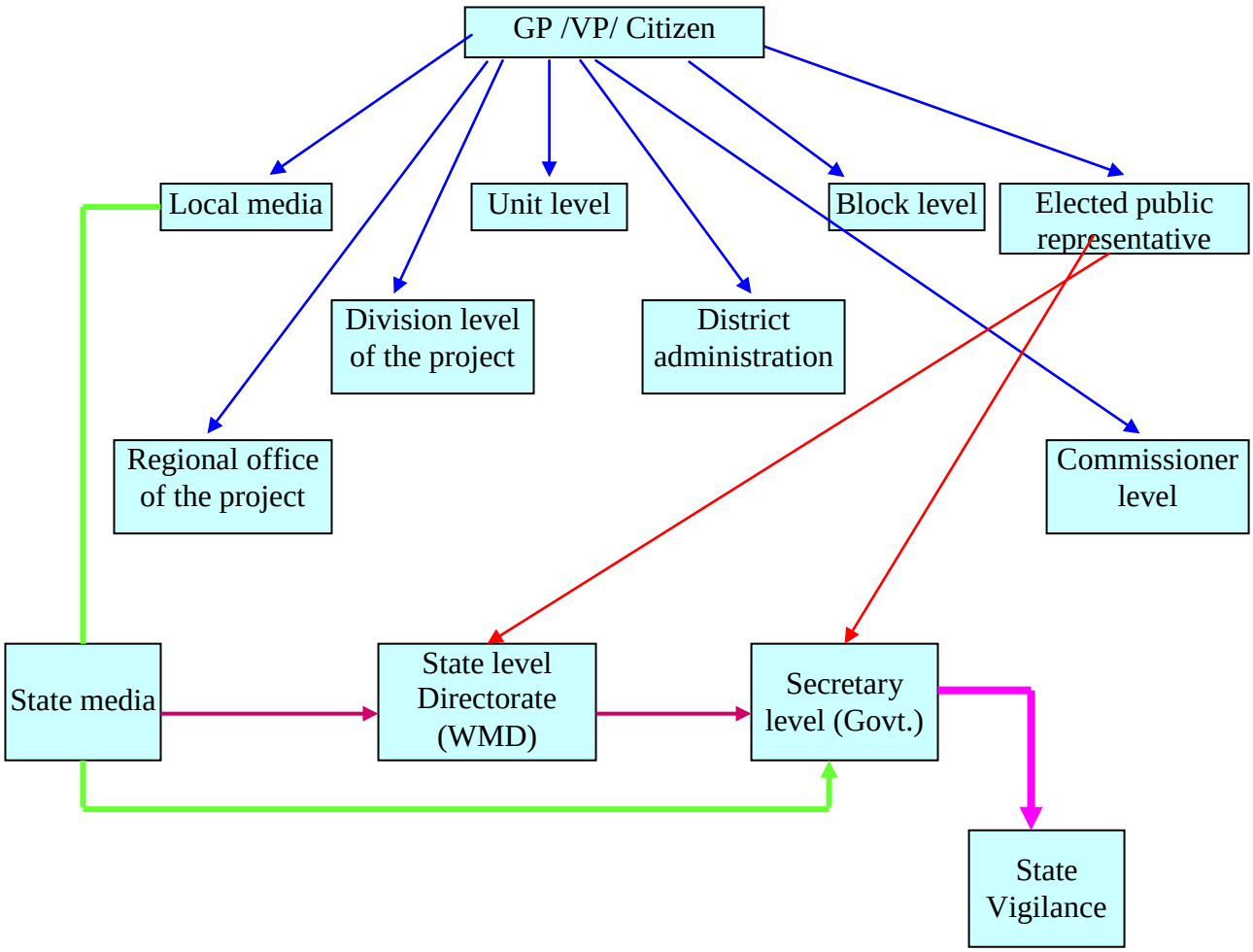
3. **Information Education Communication:** Wide publicity would be given regarding the grievance redressal mechanism available with in Gram Panchayat.

7.1 OUTSIDE THE GRAM PANCHAYAT

Following administrative, legal and other mechanisms are available for grievance redressal outside Gram Panchayat.

1- Administrative mechanism-

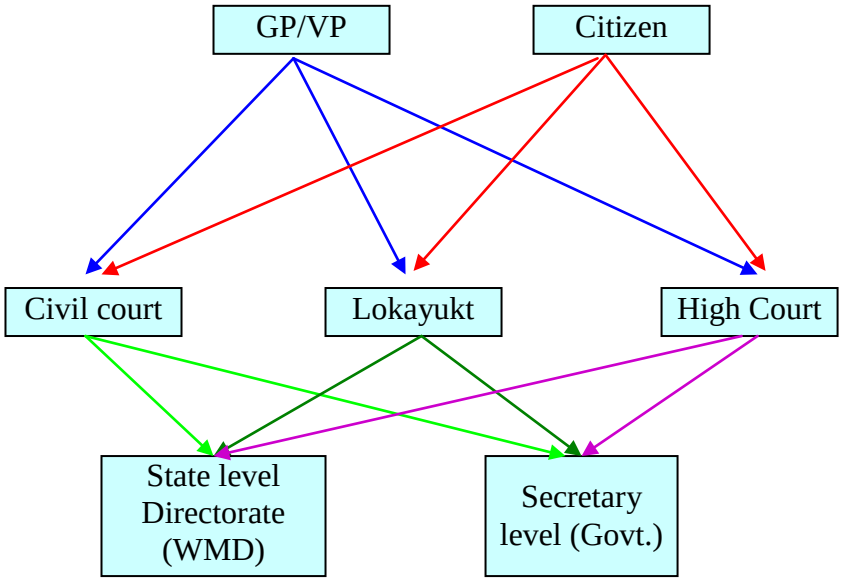
Figure 3: Administrative Mechanism (GRM)



The arrow indicates the level of the officer/institutions that the complainant can approach for grievance redressal.

2- Legal mechanism-

Figure 4 Legal Mechanism (GRM)



The arrow indicates the level of the officer/institutions that the complainant can approach for grievance redressal.

3- Other mechanisms –

- All Gram Pradhans have been designated as Public Information Officers under RTI act at Panchayat level in the project area. All complaints regarding project should be acknowledged by the Gram Panchayat & final reply is expected to be delivered within 30 days, under RTI (Constitutional mandate).
- For those citizens who are residing outside the project area, they can witness large hoardings of project area with name of Gram Panchayats at block & district headquarter. They can also access other relevant project information through the website www.wmduk.gov.in; www.gramya.in
- Stakeholders are welcome to use this facility and may also write through the e-mail ID: wmd-ua@nic.in or through postal correspondence to: Office of the Chief Project Director, Watershed Management Directorate, Indira Nagar Forest Colony, Dehradun (Uttarakhand) PIN-248 006.

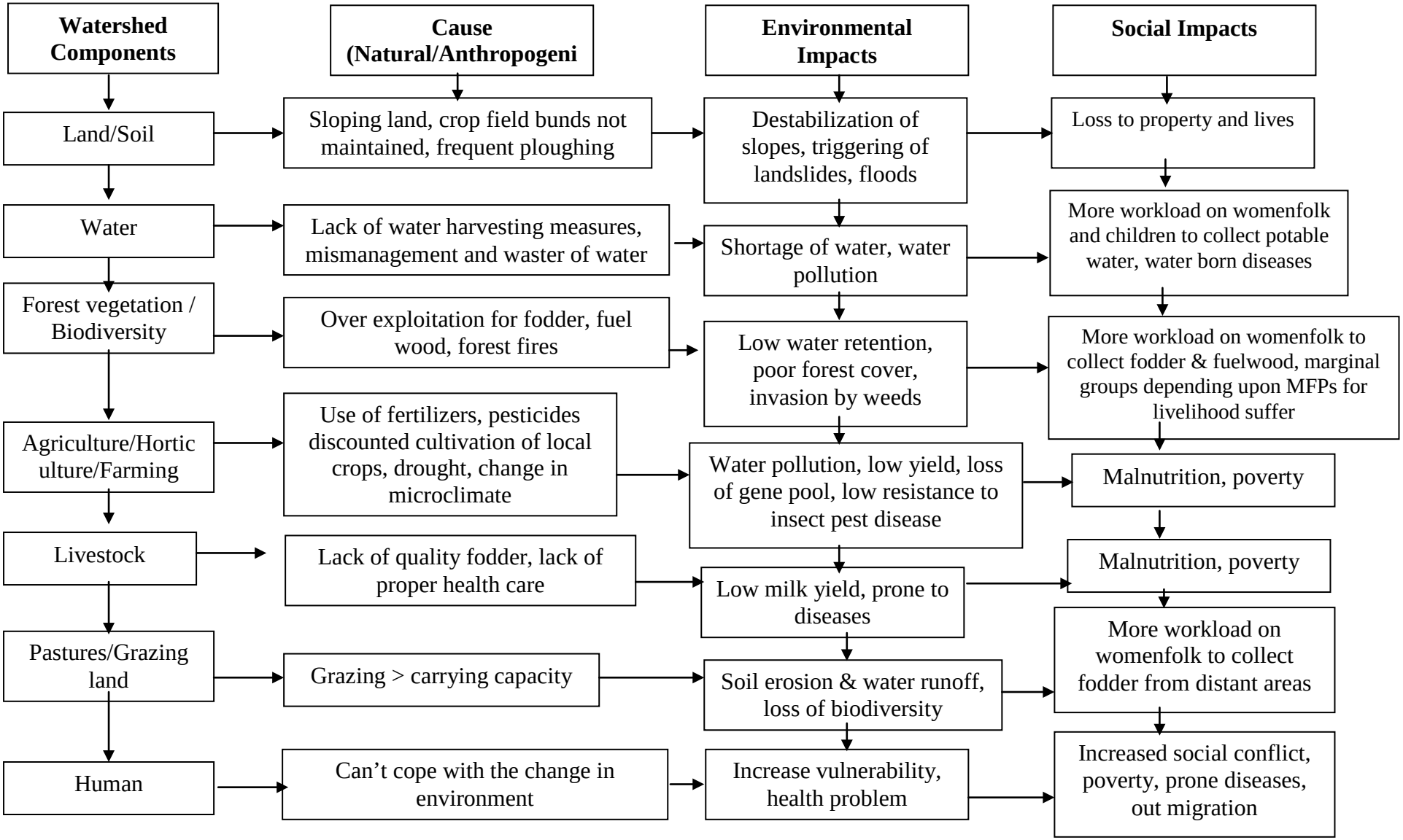
ANNEXURES

Annexure I- Details of the Erodibility Status of UDWDP-II Areas

Sl.No.	District	Name of MWS	MWS Area (ha.)	Area in Different Erodibility Classes (ha.)			
				E1	E2	E3	E4
1	Almora	Bhanwar gad	3881	0	1929	1952	0
2	Almora	Galli Gad	3081	0	1642	1439	0
3	Almora	Jaloti Gadhera	1794	0	1250	544	0
4	Almora	Khanigad	1475	54	745	676	0
5	Almora	Kirori Ganga	4662	44	4054	564	0
6	Almora	Kotgad	2194	0	1255	939	0
7	Almora	Manogad	2184	10	1639	535	0
8	Almora	Naini	1275	0	1015	260	0
9	Almora	Sidiyagad	7850	69	5685	2096	0
			28396	**177**	**19214**	**9005**	**0**
10	Bageshwar	Bagar	2575	128	1602	845	0
11	Bageshwar	Bamsera	875	191	188	496	0
12	Bageshwar	Belang gad	2268	13	1694	561	0
13	Bageshwar	Chanoli	2203	0	800	1391	12
14	Bageshwar	GasonGad	1906	381	1338	187	0
15	Bageshwar	Gogina	18500	3992	5707	6107	2656
16	Bageshwar	Kheti	2569	218	1405	946	0
17	Bageshwar	Leti Rauli	4471	363	1675	2339	94
18	Bageshwar	Loharkhet	13562	3444	6726	2598	794
19	Bageshwar	Ravati Ganga	4606	44	2175	2337	50
20	Bageshwar	Saran Gadhera	3218	182	1924	1112	0
			56753	**8956**	**25234**	**18919**	**3606**
21	Pithoragarh	Dhaulgad	2308	0	530	1814	164
22	Pithoragarh	Jajar Rauli	1921	6	874	835	206
23	Pithoragarh	Jhiniyagad	1200	44	544	612	0
24	Pithoragarh	Lakrigad	1988	19	1669	300	0
25	Pithoragarh	Lathiyagad	4503	913	3231	359	0
26	Pithoragarh	Patligad	2980	777	1339	864	0
27	Pithoragarh	Ranikhet	3846	73	3011	758	4
28	Pithoragarh	Silgad	4385	0	2435	1950	0
29	Pithoragarh	Simgad	2608	0	1593	1015	0
			25739	**1832**	**15226**	**8507**	**374**
30	Dehradun	Amlawa Nadi	3888	61	1762	2065	0
31	Dehradun	Aragad	2123	0	638	1473	12
32	Dehradun	Bantalgad	1398	0	911	472	15
33	Dehradun	Dewangad	7118	863	6103	124	28
34	Dehradun	Gariyargad	1587	123	692	772	0
35	Dehradun	Gothargad	2715	13	2415	287	0
36	Dehradun	Kalsi	2439	203	1201	970	65
37	Dehradun	Khtwagad	6380	881	4962	537	0
38	Dehradun	Muida	1594	0	1413	411	0
			29242	**2144**	**20097**	**7111**	**120**
39	Pauri	Bhaligaon	1250	0	964	486	0
40	Pauri	Chandol	2738	44	920	1747	27
41	Pauri	Chargad	6600	1355	3311	1936	0
42	Pauri	Kalagal	5281	251	2794	2222	14
43	Pauri	Kandali Nadi	3900	0	2353	1547	0
44	Pauri	Patisain	2544	97	2371	94	0
45	Pauri	Silogi	4400	0	2677	1723	0
			26713	**1747**	**15390**	**9755**	**41**

Sl.No.	District	Name of MWS	MWS Area (ha.)	Area in Different Erodibility Classes (ha.)			
				E1	E2	E3	E4
46	Rudraprayag	Bhatwari	3525	1813	1327	385	0
47	Rudraprayag	Chopra	3664	1746	1185	733	0
48	Rudraprayag	Dangi	3078	927	1501	650	0
49	Rudraprayag	Naini	983	150	670	163	0
50	Rudraprayag	Rawanganga	4241	1421	2045	775	0
51	Rudraprayag	Utrasu	3710	1120	1517	1073	0
			19201	**7177**	**8245**	**3779**	**0**
52	Tehri	Bhatwari	4540	1650	1400	1490	0
53	Tehri	Bichu	2036	7	1345	669	15
54	Tehri	Dewangarh	1986	5	1458	456	67
55	Tehri	Kharsugad	1546	249	1139	151	7
56	Tehri	Kyarigad	2854	43	1020	1791	0
57	Tehri	Mandigad	2214	516	975	723	0
58	Tehri	Nakot	1451	91	966	394	0
59	Tehri	Pali	2007	90	1531	382	4
60	Tehri	Paligad	5972	703	2202	3067	0
61	Tehri	Pantwari	1951	1365	395	191	0
62	Tehri	Patalgad	1565	528	760	277	0
63	Tehri	Ringaligad	2221	440	1729	15	30
64	Tehri	Tunetha	2378	343	1934	101	7
			32721	**6030**	**16854**	**9707**	**130**
65	Uttarkashi	Bhangerugad	3306	1581	1105	620	0
66	Uttarkashi	Deora	1034	203	756	75	0
67	Uttarkashi	Gothatgaon	2156	1011	836	309	0
68	Uttarkashi	Irak	1851	309	1453	69	20
69	Uttarkashi	Kamola	1653	1088	445	120	0
70	Uttarkashi	Koti	2700	1025	1666	0	9
71	Uttarkashi	Malegad	3236	380	2270	586	0
72	Uttarkashi	Miyangad	4495	0	4464	31	0
73	Uttarkashi	Moltari	1782	1146	552	84	0
74	Uttarkashi	Patao	1616	121	1269	185	41
75	Uttarkashi	Paunti	3272	118	2753	396	5
76	Uttarkashi	Purola	1562	280	382	900	0
77	Uttarkashi	Rana	1811	485	1030	296	0
78	Uttarkashi	Sarugad	7135	160	2624	4351	0
79	Uttarkashi	Saundari	2935	274	2271	370	20
80	Uttarkashi	Sunaldi	1862	193	1347	322	0
81	Uttarkashi	Thadunga	2697	1198	1050	502	0
			45103	**9572**	**26273**	**9216**	**95**
82	Dehradun	Model - Bidhalana Nadi	2417	0	294	1963	0
			2417	**0**	**294**	**1963**	**0**

Annexure II Linkages among watershed components (cause and effect)



Annexure III ESMF implication in UDWDP-I Sample Study Questionnaire

S N	Questions
1.	Weather the peoples were aware about ESCP through trainings and information provided by the project, prior to the formation of GPWDPS.
2.	Were the ESCP safeguards considered by the community during the formation of GPWDPs.
3.	Was such guideline on environmental and social issues , helpful for them to prioritise activities for planning and implementation
4.	Were the community members aware about possible negative impacts of activities and necessity to take mitigation measures.
5.	The proposals for NRM activities from womenfolk were considered in GPWDP.
6.	Any proposed activity was changed/removed from GPWDPs according to ESCP safeguards.
7.	Any proposal of activities, i.e. was sent back to WWMC to review before appraisal from DPD office.
8.	Any activity which likely to supposed to be against the ESCP safeguards was proposed/implemented.

Annexure IV Consultation Workshop on Environmental and Social Management Framework for Proposed UDWDP II (Proceeding)

A Consultation Workshop on Environmental and Social Management Framework (ESMF) for proposed UDWDP-II was held on 5th Feb 2013 at Watershed Management Directorate. The objective of the workshop was to deliberate on the ESCP proposed for UDWDP-II with the community members from the project area, technical experts, NGOs, scientist and PRI members. About 55 participants representing different stakeholders groups participated in the workshop. The workshop was inaugurated by Mr Bhaskaranad, Chief Project Director and Secretary Watershed Govt. of Uttarakhand. Mr Jairaj, APCCF (Environment) also addressed the workshop.

In his inaugural address, Mr. Bhaskaranand informed the participants about the success of UDWDP phase-I in bringing about the development of the area and the community members through watershed projects. He spoke about the importance of high levels of community participation in making informed decisions for achieving the project objectives. Mrs. Neena Grewal, Additional Director gave a presentation about the proposed UDWDP-II. This was followed by a presentation on the proposed Environmental and Social Code of Practices (ESCP) and film shows on the different interventions carried out in UDWDP-I.

Highlights of proposed Environmental and Social Guidelines

- The environmental and social guidelines would promote the ability of communities to select a package of sub-projects and activities which will not only minimize or mitigate the negative environmental and social impacts but also enhancing the positive impacts.
- To ensure it, an Environmental and Social code of Practices has been developed and annexed in the guideline. All the activities under the project should be in accordance to these codes of practices.
- The activities which cause negative impacts to the environment should not be implemented under project as listed in Formats, 1a&1b of the guidelines.
- With accordance to the past experiences, all the possible negative impact and the mitigation measures thereof are also mentioned the guidelines to decisively consider during PRA exercise.
- To assess all the environmental and social impacts of activities, Format-2 should be used at the planning phase.

- The environment and social aspects to be considered, implemented and monitored by all project partners will be done in four stages of the preparation of Gram Panchayat Watershed Development Plan (GPWDP) and the action plan for the transhumant population.

FEEDBACK FROM PARTICIPANTS

Mr. Jairaj, APCCF (Environment)

- The impact of the project activities should be reflected through the voice of community.
- Project objective should be clearly defined and achievements should be assessed on pre-defined parameters.
- Communities should be made aware about global warming and its effect on climate change.

  Traditional knowledge of the local people should be conserved and documented.

Dr Ambrish Kumar, Sr. Scientist, Central Soil and Water Conservation and Research and Training Institute (CSWCRTI)

- The experience, success and failures of last project should be documented and project learnings should be incorporated in UDWDP-II.
- The successful intervention of phase-I should be replicated in the sites of similar climatic conditions under phase-II.
- Preference should be given to Watershed Treatment Works along with livelihood activities.
- Long term policies/ solutions should be adopted, considering the climate change issue.
- Prevention measures should be adopted to check soil erosion by using stone riser technique for field bunding.
- The approaches / achievements of the farmers, directly benefited by the project and those who adopted the activity, should be documented separately.
- Impact of livelihood activities should be assessed on the basis of productivity enhancement due to agriculture interventions and on the basis of household income as per the guidelines of "Swaminathan committee "
- In rainfed areas, the erosion intensity is higher due to steep slopes, so shoulder bunding should be encouraged to prevent it.
- Use of micro sprinklers should be encouraged to enhance the irrigation potential.

Dr. Avinash Anand Chief Veterinary officer

- Animal husbandry Dept. is also carrying out a number of activities for livestock development. To avoid duplication greater coordination between departments is required so that convergence of resources may be achieved.
- Dairy development planning should be based on market availability.
- Convergence should be ensured for verification of livestock owned by transhumant, under Gaw Sanrakshan Act.
- Cattle Shelters should be constructed in Vanpanchayat areas.

Ms. Ruchi Kukreti, NGO-RLEK

- Climate change mitigation measures should be adopted by the projects.
- Local self governance and training of Panchayat is required.
- MIS should be developed for proper monitoring at each level.
- Short studies on gender issues should be conducted.
- Action research and impact study could be done through documentation of success stories.

Dr. Mudgaran, CSWCRTI

- In the hilly areas of Uttarakhand, fish rearing should be encouraged in the ponds, tanks, rivers etc.
- Project staff and community should be trained in fish rearing.

Diversified use of water harvesting structures constructed under projects should be ensured.

Sardar Singh, Pradhan Gram Panchayat – Samalata, Kalsi block, Dehradun

- Along with roof rain water harvesting, the water of small streams (gadhera) should also be properly used in agriculture and allied activities.
- The local varieties should be promoted.
- Fruit processing should be encouraged to reduce the post harvest losses.

Measures to prevent destruction of agriculture fields and crops by wild boars and monkeys.

Jagat Ram joshi- Gram Panchayat Aaula Pithoragarh

- Local grass sp. should be used as nutritious fodder.
- Fruit preservation techniques are required.

- Technical know-how about irrigation and land slide. Measures to control wild boars and monkeys.

Dev Singh Gram Panchayat, Bageshwar

- Medicinal plant cultivation should be promoted.
- NBC should be promoted to increase milk production and livestock improvement.

Pravin Singh Koranga, GP- Siri, Block-Kapkot, bageshwar

- Conservation of Natural resource should be more emphasized
- Agave plantation should be encouraged preventing soil erosion.
- Use of solar equipments should be encouraged.
- Water mill (Gharat) rejuvenation should be encouraged.
- Livestock activities to enhance milk production along with Goat/Sheep rearing should be encouraged.
- Measures to control monkeys and boars.
- Technical training on local HVCs to enhanced productivity.

- To reduce huge post harvest losses in local fruit crops, post harvest management need to be encouraged

Ms. Ruchi, RLEK

- For processing activities, a model of dryer which has been used under ICMOD should be considered. NGO Aarti from Pune is also using such dryers.

Md. Yusuf, GP-Dangi, Augustymuni block, Rudraprayag

- Better & Effective planning especially for low income groups is needed.
- Use of solar energy devices should be encouraged.
- There should be more transparency in the project

Rashmi Negi, Pradhan, Guptkashi, Ukhimath block, Rudraprayag

- Drinking water and water for irrigation is still a major problem, which needs to be addressed on priority basis.
- Naula/dhara should be rejuvenated.
- Measures to control monkeys and boars, as it is a major problem in the hill area.

Gangotri Rana, Pradhan – Sankari, Ukhimath

- Effective measure to be taken to control monkey menace.
- Cultivation of local varieties should be encouraged.

Annexure V Salient features of lessons learned from past projects namely Doon Valley, and Siwalik Projects

Broad Activities	Lessons Learned	Proposed Action or Suggestion
Forestry	Where women assumed a predominant role in planning and management of plantations the survival percentage of plantation and equitable sharing of benefits were higher.	Special focus to sensitise the women and ensure there higher participation in decision making and implementation regarding Forestry activity.
	Plantations which were protected by village communities or Van Panchayats (VP) of the villages having greater sense of ownership over the common lands were more successful.	Van Panchayats have traditionally brought about a higher sense of ownership and commitment towards sustainable management of common lands. VPs should be strengthened. Ensure rights of transhumant are promoted
Drainage Line treatment	Places where vegetative treatment were adopted starting from the source of erosion in the top of the drainage line the control of soil and rock erosion was considerable and stable for longer period.	WWMC plan should consider treatment of drainage line from top to bottom. Vegetative treatment measures are more successful than stone civil works.
	In places where only agriculture fields prone to erosion were treated with stone civil works and simultaneously the upstream was not treated, the created structure was not successful in ensuring the safety of agriculture land.	WWMC plan should start treatment from the source of erosion and treat the lower areas subsequently.
Water Harvesting	The institution of User Groups has shown success in management of water Guls (minor irrigation channel) and equitable sharing of water resources.	Focus by WWMC, FNGO, MDT for formation and strengthening of Water User Groups. Arrangement for land donation if required by those who are not vulnerable.
	Wherever Technical inputs were strong the quality of Water retaining structures was significantly superior and satisfactory in reference design, quality and fulfilment of water needs.	Strong technical input and constant supervision for design and construction of water retaining structures.
Farming System	Introduction and demonstrations of HYVs, cash crops, and other field-based technologies were adopted by large number of farmers when regular and consistent demonstrations were done on pre- announced field days by technical experts.	WWMC should ensure that all innovative techniques of farming systems are introduced with guidance and supervision of experts so that ES Guidelines are complied.
	Lack of market linkages for cash crop, High Value Crops led to lower realisation of prices to farmers.	Cash crops should be grown after preparation of a marketing strategy.
	Uncultivated land of absentee landlords when utilised for cultivation of grasses for fodder resulted in reduction of drudgery of women.	WWMC could take initiative to utilise lands of absentee landlords for use which benefit community. There should be an agreement with the owner. The ownership of land will remain with the original landlord who is temporarily absent because of seeking livelihood elsewhere.
	Organic Farming inclusive of Pest management practices are readily accepted and assimilated by small land holding farmers	WWMC should endeavour to adopt Organic Farming system and strive for obtaining Certification of Organic Farming and

Broad Activities	Lessons Learned	Proposed Action or Suggestion
	in hilly areas as compared to farmers with bigger land holding in Foothill areas.	subsequently benefit from higher prices in market for branded Organic products.
	Increase in incidence of stall feeding animals results in higher production of milk and higher productivity of lands providing fodder/.	WWMC to encourage breeding of such livestock which is in lactation period of longer duration of months.
	Incidence of diseases is considerably lower in animals in villages where health care activities were undertaken on a regular basis for animals	WWMC to encourage regular Livestock healthcare camps.
Rural Infrastructure	Villages which had problem to transport farm produce to nearby motor road and market had faster and safer communication link after improvement of bridle path as link road.	Improvement of bridle paths should be done with the objective of improving access to markets and school.
	The students who could not reach school because of missing culverts and bridges over swollen streams streams could attend school regularly after construction of culverts by village community.	Improvement of bridle paths should be done with the objective of improving access to markets and school.
Revolving Fund	The Revolving Fund of GAREMA is used as a corpus for future development activities and loan to SHG in the village.	Any saving by WWMC from its plan expenditure should be ploughed into Revolving Fund to be used in manner similar to RVC revolving Fund.
SHGs	Creation of SHGs considerably helped improve income level of landless, marginal farmers and women leading to higher social equity.	Formation of SHGs should be enhanced and mechanism created for dovetailing with income generating activities.
Holistic View of Watershed approach	The impacts of the land based Watershed Development activities implemented by GAREMA is considerably higher in those villages that also have vibrant and confident social Institutions of SHG that has found new strength from increase in income. The conflict levels in such villages are low because the conflicts that rose have been amicably sorted in participative meetings.	WWMC of GPs should plan to provide opportunity of economic growth to all socio-economic sections of the Gram Sabha. The WWMC of GP Plan should ensure that opportunities for increase in income levels of owners of large private lands, owners of marginal land and the landless are provided in equitable manner in the plan.
Tribal and Transhumant	The concern for negative impact on customary practices of Transhumant and other users of common Property resources are not voluntarily brought forth by VDC unless specifically asked by Project.	MDT should ensure that information regarding customary practices of Transhumant and other users of common property resources proposed to be managed by Gram Sabha is explicitly recorded in Gram Panchayat Plan and provision of ES Guidelines are complied Transhumant have formal rights on reserved forest. Please delete are limit it to only settled tribes.
	Conservation of forests for sustainable utilization of forest resources, fodder, fuel and water, with awareness programmes among tribal brought encouraging results. It also helped their livestock requirements.	Focus on livestock management, animal husbandry, shelter and water needs

Annexure VI Learnings from UDWDP I

The learning's from UDWDP-1 were as follows:

Partnering with NGOs for social mobilization, project implementation and support for Agribusiness was a successful initiative in the project. The human resource development by the project would be useful for central sponsored Integrated Watershed Management Programme as well as for follow on projects. Such experience would also be replicated in other community based programmes.

Involvement of Women Social Mobilization Workers: In the project a number of facilitators for a cluster of Gram Panchayats and village motivators at the village level were engaged. These village motivators and facilitators visited villages, assisted in PRA and organised women along with other stake holders into groups. These village motivators would prove to be resource persons for other programmes.

Women Aam Sabha: These Sabhas served as a platform for women to bring up issues of concern, identifying needs and redressing grievances. Women Aam Sabhas were held prior to finalization of Gram Panchayat plans to identify and prioritize issues impacting the women locally. It helped in addressing gender issues in a transparent way.

Involvement of Women in Governance: Woman Ward member was made a co-signatory with the Gram Pradhan for the operation of the dedicated watershed account of the project.

Livelihood Interventions: The project was designed to target all the rural inhabitants of the project area thus sharing the benefits of the project. The poorest and the most vulnerable sections of the community were addressed through the support of vulnerable group fund.

Participatory Monitoring and Evaluation (PME) were carried out in the project as a social audit process. PME proved to be an important feedback and learning mechanism for the community in the project area.

Pine briquetting: The project introduced pine briquetting as a pioneer venture to meet the objective of reducing drudgery of women and forest fires. The pine briquette was also an income generating activity where the user groups could sell the briquettes in the village and in the nearby market.

Cost Sharing: To ensure sustainability of activities that enhance productivity and incomes of the rural population, the project laid emphasis on sharing of costs by the individual beneficiaries, for this the cost sharing norms were clearly defined.

Enhancing the capacity of the GPs: To ensure proper, effective and efficient management of the project funds the project funded for the appointment of Account Assistant in each Gram Panchayat. This Account Assistant was generally a local of the village having knowledge in accounting procedures. This experience would benefit to other Govt. programmes such as MNEREGS, IWMP etc.

Sustainability through User Groups: In the project for future sustenance and O&M of common assets user groups were formed. In the project user groups were especially for water based structures such as irrigation tanks, roof rain water harvesting tanks, irrigation channels/guls, naula and ponds. The members of user groups conducted regular meetings and generated fund for operation and maintenance of created common assets. The funds were collected on monthly basis or on crop basis depending on the rules and regulations of that particular user group.

Transhumant Action Plan

Through the Transhumant Action Plan prepared in Gramya I; participation of the indigenous people in the project activities was incorporated. Action plans were made to safeguards the interests of transhumant populations and provisions were made to ensure these populations within the project areas were not negatively impacted. In case of few semi-sedentary groups amongst Gujjars, a novel initiative of facilitating basic primary education for their children was started in Vikasnagar and Augustmuni division; this provided during their stay in project area.

IPM, ICM and IPDM:

Knowledge of IPM, ICM and IPDM practices was provided to farmers under UDWDP I. The Project conducted awareness programmes for organic farming practices in the project area, and on the use of improved variety of seeds. Constant efforts by the Project have evoked response from quite a number of farmers who have adopted use of quality compost and bio-pesticides. Due to project interventions farmers have adopted several modern techniques and practices like deep ploughing, line sowing, mix cropping, use of organic manure, basal dose application and seed treatment to get maximum production

Annexure VII-Environmental and Social Code of Practices

SN	Subprojects/activities	Code No.	Measure/Guideline
	FORESTRY	EC F 1.1	All plantation activities should be done in accordance with Manual of Forestry.
		EC F 1.2	Preference should be given to the local endemic species for plantation.
		EC F 1.3	Select native fodder species with high nutritive value.
		EC F 1.4	Plantation of mixed broadleaf species to supplement fodder.
		EC F 1.5	To increase the availability of local fodder/fuel, agro-forestry practices should be promoted.
		EC F 1.6	Plantation of fodder species in unculturable wastelands.
		EC F 1.7	Van Panchayats and Biodiversity groups in the GPs should be mobilized to ensure a higher sense of ownership and commitment towards sustainable management of common forest lands.
		EC F 1.8	Equal sharing of resources among users by rules/regulation.
	SOIL & WATER CONSERVATION	EC SC 2.1	Levelling of crop fields and maintenance of terraces / bunds to check water runoff and soil loss.
		EC SC 2.2	Storage of surface/Rain water through water storage structures.
		EC SC 2.3	Vegetative soil conservation measures around the engineering structures (bio-engineering measures).
		EC SC 2.4	Main streams/rivers, of MW/SWS, should be treated through Retaining Wall like stream bank protection activities instead of Cross barriers/ Check dams.

		EC SC 2.5	Quarrying for stones prior to construction of any structure in a site should strictly prohibited. The engineering structures for DLT should be constructed from loose bolder/stones lying alongside the drainage line.
		EC SC 2.6	Use of stone riser technique for field bonding should be adopted as a preventing measure to check soil erosion.
	AGRICULTURE/ HORTICULTURE	EC AG 3.1	High nutritional value traditional crops should not be totally replaced by high yielding varieties.
		EC AG 3.2	To maintain soil fertility, crops rotation and bringing the cultivated land under leguminous crops (pea, lentil etc.) should be practiced.
		EC AG 3.3	To maintain biological fertility of the soil, planting of nitrogen fixing species on the crop field bunds should be done.
		EC AG 3.4	Selection of low water demanding (high efficiency in water utilization) HYV crops should be given preference.
		EC AG 3.5	Protected cultivation (use of polyhouse, polypit, polytrench, etc.) to reduce the chances of HYV crop failure
	Integrated Crop Management (ICM)	EC ICM 4.1	Site-specific suitable crops should be grown.

		EC ICM 4.2	To retain soil health and reduce soil contamination & water pollution, use of bio-fertilizers (bio-compost, vermicompost, organic mulch (Green manure), microbial inoculants, etc.) and bio-pesticides should be promoted.
		EC ICM 4.3	Lesser use of permissible chemical fertilizers / pesticides (Annex 6 & 7) will reduce chances of soil contamination and water pollution.
		EC ICM 4.4	Plantation/protection of pest controlling plants (Marigold, etc.).
		EC ICM 4.5	Adoption of package of following cultural practices should be promoted.
		EC ICM 4.5.1	Deep ploughing
		EC ICM 4.5.2	Line sowing
		EC ICM 4.5.3	Mix cropping
		EC ICM 4.5.4	Use of Organic Manure
		EC ICM 4.5.5	Seed Treatment
		EC ICM 4.5.6	Base dose Application
		EC ICM 4.6	Use of permissible chemical pesticides should only be done in accordance to the application timings and safety measures mentioned in IPM strategy of the project.
	WATER HARVESTING	EC WH 5.1	Rain water harvesting and storage of surface water (of streams, nalla, etc.) through water storage ponds/pits should be encouraged.
		EC WH 5.2	Construction of Roof Rain Water Harvesting Tank will help to collect rain water for domestic uses and kitchen gardening.
		EC WH 5.3	In rainfed areas, Low Density Polyethylene Tanks should be encouraged to collect rain/source water for irrigation.

		EC WH 5.4	Regular disinfection by chlorination and use of filters in storage structures will reduce chances of water borne diseases.
		EC WH 5.5	Proper designing, size and site selection for channel should be ensured.
		EC WH 5.6	Construction of smaller underground tanks to reduce chances of leakage.
		EC WH 5.7	Use of Ferro-cement for repairs of tanks.
		EC WH 5.8	Deep wells may not be dug to reduce drawing of underground water.
		EC WH 5.9	Disposal of waste water away from the ponds and proper drainage
		EC WH 5.10	Fish rearing to consume the mosquito eggs.
		EC WH 5.11	Rules and regulations over sharing and rational use of water to be framed by the stakeholder communities.
		EC WH 5.12	Selection of site for community water storage tanks should be as per the convenience and cooperation of stakeholders to reduce conflicts among users.
		EC WH 5.13	Installation / lying of pipelines deep in the ground will reduce freezing of water and.
		EC WH 5.14	Compaction of the excavated soil in the dug pipelines
		EC WH 5.15	Skill development among villagers to repair / maintain the pipelines
		EC WH 5.16	Strengthening of traditional local institutions will also help to sort out conflict among users.
		EC WH 5.17	Construction of water harvesting or water supply structure in individual and community land should be done only with the consent and the approval of the beneficiaries and Gram Panchayats.
		EC WH 5.18	The benificiaries should form usergroups and these groups themselves should be reach to an agreement prior to construction of water harvesting structures on any ones private land belonging the group.

	LIVESTOCK	EC LS 6.1	Animal health camps should be organised under supervision of technical experts.
		EC LS 6.2	Farmers should be encouraged for periodic vaccination to protect livestock from epidemic diseases.
		EC LS 6.3	To treat livestock, use of herbal medicines should be encouraged.
		EC.LS.6.4	Local fodder crop/ grass species should be encouraged.
		EC LS 6.4	Use of organic manure/bio-fertilizers should be encouraged for fodder crop production.
		EC LS 6.5	To reduce biotic pressure on forest, farmers should be encouraged to adopt new livestock techniques, like stall feeding, breed improvement, improve fodder production etc.
	AGRIBUSINESS	EC AB 7.1	Use of hardy local improved varieties for cultivation will reduce the use of chemical fertilizers and pesticides.
		EC AB 7.2	Cultivation of improved local varieties to reduce threat on local gene pool.
		EC AB 7.3	Use of alternate non wood staking material.
		EC AB 7.4	Use of bio-products for packaging
		EC AB 7.5	Safe disposal of organic and inorganic waste separately, as per waste management guidelines of WMD(Annexure-XII)
		EC AB 7.6	Crop diversification and intercropping according to market requirement and as natural pest barrier.
		EC AB 7.7	Proper pollution control arrangements in food processing units.
		EC AB 7.8	The FIGs/ FFs, which will be responcible to run the processing unit/grading center, should have an agreement prior to establishment/construction of such unit with GP or individual (as applicable), to whom the land will belongs.

	INCOME GENERATING ACTIVITIES (IGA) Potential IGAs- 1. NTFPS 2. Decorative items 3. Wood craft 4. Bamboo products 5. Nursery 6. Mushroom 7. Beekeeping 8. Fish farming 9. Woollen products	EC IGA 8.1	Strengthening of village resource management institutions to reduce conflicts among the users over common resources
		EC IGA 8.2	Prohibited use of species to avoid over exploitation.
		EC.IGA.8.3	Use of Styrofoam tray to reduce soil loss in nursery activities.
		EC IGA 8.4	Use of water saving techniques / water harvesting to meet demand of water in IGA activities.
		EC IGA 8.5	Awareness among the users and proper training will help the users in mushroom and fish farming activities.
		EC IGA 8.6	Processing of wool washing not be done directly in water sources.
		EC IGA 8.7	Use of masks or nose cover (cloth) during wool processing.
	NEED BASED INFRASTRUCTURE DEVELOPMENT	EC IF 9.1	Treatment of the destabilized sites through vegetative measures, jute netting, etc.
		EC IF 9.2	Quality of constructions should be ensured to reduce the failure and more hazards in downstream areas.
		EC IF 9.3	Proper designing and planning for road construction/laying to reduce soil erosion/landslips.
		EC IF 9.4	Bio-physical measures to rehabilitate disturbed land and checking soil erosion.
		EC IF 9.5	The land, not suitable for other productive purposes should be brought under infrastructure activities.
		EC IF 9.6	Preference to marginal groups in local employment.
		EC IF 9.7	Construction of any structure in individual or community land should be done only with the consent and the approval of the beneficiaries and Gram Panchayats.

		EC IF 9.8	Construction of assets of common benifits should be strictly prohibited in the lands which belongs to vulnerable group members.
	USE OF ALTERNATE ENERGY SOURCES	EC AE 11.1	Alternative means of energy should conserve the adjoining forests and provide to meet the needs of the people
		EC AE 11.2	Environment friendly alternative energy sources and/or the energy saving devices should be installed on priority basis to share the labour put in by womenfolk to collect fuel wood.
	Biogas	EC AE 11.3.1	It is to be insured that the installed bio-gas plant is of good quality standards and leak proof to avoid accidents due to leakage of methane.
		EC AE 11.3.2	User should be aware about proper dung to water ratio and to avoid any gap between 2 slabs covering the slurry outlet tank to reduce mosquito breeding.
		EC AE 11.3.3	To fulfil the higher water requirement per day, in the House Holds having Biogas, the water availability issue should be also taken care.
		EC AE 11.3.4	Training should provide for the proper use and awareness to avoid accidents.
	Pine Briquetting	EC AE 11.4.1	Charring should be done under fully covered pit or tighten quill to reduce harmful smoke.
		EC AE 11.4.2	Women should be aware to avoid synthetic saari/dress during charring to reduce fire hazard.
		EC AE 11.4.3	Use of rubber sleeper/shoes should ensure to avoid electricity shock incidents.
	Solar equipments	EC AE 11.5.1	Components of waste/unused batteries of solar equipments are hazardous to health so there safe disposal should be ensured.

Annexure VIII Mitigation measures for negative impacts and Monitoring indicators

Subprojects/activities	Negative Impacts	Mitigation Measures	Monitoring Indicators
FORESTRY **1. Afforestation** **2. Silvi-pasture** **3. Fuel wood Plantation**	▪ Introduction of exotic species. ▪ Proliferation / dominance of invasive / exotic species ▪ Conflict among user over resource sharing • Shortage of grazing land during initial phase. • Restrict rights of the people	• EC F 1.1 • EC F 1.2 • EC F 1.3 • EC F 1.4 • EC F 1.5 • EC F 1.6 • EC F 1.7 • EC F 1.8 • EC F 1.9	• Area covered under afforestation (ha). • Increase/decrease in fodder / fuelwood yield. • Decrease/increase in women labour (days) for collection of fuel wood and fodder. • Increase/decrease in number of Oak seedlings/sapling. • Increase/decrease in forest crown cover/ canopy closure. • Increase/decrease in soil moisture. • Increase/decrease in forest floor vegetation and litter layer thickness. • Reduction/increase in occurrence of fire incidences. • Increase/decrease in forest wealth (resin, NTFPs, leaf litter layer, fodder etc.). • Increase/ decrease in the use of non-chemical applications e.g.,bio-pesticides, mechanical, cultural activities. ▪ All receive benefits.

Subprojects/activities	Negative Impacts	Mitigation Measures	Monitoring Indicators
AGRICULTURE **1. High Yielding Varieties** **2. Diversified Agriculture** **3. On-Farm Cultivation (Vegetables, spices and condiments)** **4. Terrace Repair** **5. Vegetative Boundary**	• Loss in soil moisture. • Loss in soil fertility (Nitrogen, Carbon, etc.). • Soil and water pollution due to use of pesticides. • More demand of water for irrigation and competing demands on surviving/existing sources which are used for drinking. • Pressure on local forests/ vegetation for fodder for animals and packaging material. • Loss of traditional / indigenous practices of crop cultivation. • HYVs are labour intensive and bring more workload on women. • Marginal groups (landless farmers/labourers) will benefit less, since they do not have land to bring under HYVs • Due to monoculture chances of crop failure due to frost/fog, insect/pest and diseases. • Discontinuation of barter system and more dependency on external resources / agents and, therefore, loss of self-dependency. • Possibility of loss of local races/cultivars/gene pools/ crop varieties • Conflicts among the neighbouring farmers due to the shade caste from vegetative field boundary	• EC AG 3.1 • EC AG 3.2 • EC AG 3.3 • EC AG 3.4 • EC AG 3.5 • EC ICM 4.1 • EC ICM 4.2 • EC ICM 4.3 • EC ICM 4.4 • EC ICM 4.5 • EC ICM 4.5.1 • EC ICM 4.5.2 • EC ICM 4.5.3 • EC ICM 4.5.4 • EC ICM 4.5.5 • EC ICM 4.5.6 • EC ICM 4.6 • EC F 1.5 • EC SC 2.1 • EC SC 2.6 • EC WH 5.2 • EC WH 5.3	• Damage to crops (resistance against diseases, frost, drought etc.) • Production of grain, straw and other plant products • Quality of production (taste, odour, colour, perishability etc.) • Increase/decrease in per unit land economic benefits • Changes in nature of soil (fertility, hardness, moisture, colour etc.) • Quantity of seeds produced • Reduction/increase of soil erosion and water runoff • Increase / decrease in work load on women • Number of local crop varieties grown and area under them • Increase/ decrease in the use of non-chemical applications e.g.,bio-pesticides, mechanical, cultural activities.

Subprojects/activities	Negative Impacts	Mitigation Measures	Monitoring Indicators
HORTICULTURE **1. Fruit Crops**	• Soil contamination due to use of chemical fertilizers and pesticides and herbicides. • Increase in water consumption, therefore depletion in water resources. • Increase in water pollution due to use of pesticides / fertilizers. • The marginal landholders will benefit less, as they may not have land to bring under horticulture. • Health hazards due to more use of chemical fertilizers & pesticides	• EC ICM 4.2 • EC ICM 4.3 • EC AG 3.4 • EC SC 2.2 • EC IF 9.7	• Increase or decrease of production of fruits and other plant products • Quality of production (taste, odour, colour, perishability etc.) • Increase / decrease in economic benefits per unit land • Damage of crops against diseases, frost, drought, etc. • Increase/ decrease in the use of non- chemical applications e.g.,bio-pesticides, mechanical, cultural activities

Subprojects/activities	Negative Impacts	Mitigation Measures	Monitoring Indicators
WATER HARVESTING **1. Village Pond** **2. Irrigation Channel** **3. Water collection through pipelines** **4. Roof water harvesting** **5. LDPE Tanks** **6. Ground water harvesting (Digging of wells)**	▪ Water logging due to improper drainage. ▪ Water pollution through deposition of waste materiel due to public use. ▪ Pollution through organic (Polyethylene/ plastic) waste by the use of LDPE sheets and plastic pipelines for water harvesting. ▪ Health impacts due to breeding of mosquitoes. ▪ Disputes over water sharing (domestic demand vs irrigation demand) may arise. ▪ Mud formation along the water distribution points ▪ Marginal farmers are deprived from the benefits as they have small holdings. • More chances of water borne diseases if the unclean water is consumed without treatment • Seepage/leakage in roof tops and under water tanks. • Drawing of underground water may lead to	▪ EC WH 5.1 ▪ EC WH 5.2 ▪ EC WH 5.3 ▪ EC WH 5.4 ▪ EC WH 5.5 ▪ EC WH 5.6 ▪ EC WH 5.7 ▪ EC WH 5.8 ▪ EC WH 5.9 ▪ EC WH 5.10 ▪ EC WH 5.11 ▪ EC WH 5.12 ▪ EC WH 5.13 ▪ EC WH 5.14 ▪ EC WH 5.15 ▪ EC WH 5.16 ▪ EC WH 5.17 ▪ EC WH 5.18	• Increase/decrease in water use efficiency for all activities e.g., household consumption, irrigation, drinking, etc. • Increase/decrease in irrigated area • Increase/decrease in crop production • Increase/decrease in water quality (colour, taste, odour) • Decrease/increase in time and distance per day put in for collection of water • Access to water by the marginalized groups • Alternate livelihood for those vulnerable whose land may be affected. ▪ Access to transhumant to meet their water requirements.

Subprojects/activities	Negative Impacts	Mitigation Measures	Monitoring Indicators
	shortage of water in other adjacent sources. • Deposition of excavated soil damages the surrounding vegetation • Conflicts among the users/owners of the land where the well is dug. • Due to freezing of water in winters, water pipes get damaged and water supply gets interrupted. • Difficult on the part of villagers to maintain / repair pipelines. • Loss of land		
LIVESTOCK **1. Natural breeding** **2. Artificial insemination** **3. Fodder management** 4. **Veterinary camps**	• Introduction of exotic/alien species of grasses and fodder crops to meet the demand of fodder, that dominate the local species. • Hybrid animals are more prone to diseases. • Hybrid animals require more provisions for health care. • Limited breeding facility (a bull can serve only 2 animals in a week) in case of hybrid	• EC LS 6.1 • EC LS 6.2 • EC LS 6.3 • EC LS 6.4 • EC LS 6.5 • EC LS 6.6	• Reporting of animal coverage. • Non-occurrence of diseases/ disease outbreaks. • Production of milk, meat enhancement. • Overall improvement/deterioration in productivity of milk, meat etc. • Quantity of fodder saved/consumed. • Enhancement/decrease in fodder production. • Increase/reduction in work load of women. • Changes in animal type (animal composition).

Subprojects/activities	Negative Impacts	Mitigation Measures	Monitoring Indicators
	animals. • Hybrid animals require intensive care attention. • Improper treatment of grasses or straw might lead to food poisoning. • Dependency on professionals in the artificial insemination and other activities and in the absence of professionals quality of service will deteriorate. • Poor quality vaccination may increase the out-break of diseases.		• Increase/ decrease in the use of drugs and pesticides. • Facilities extended to transhumant.
CONSTRUCTION / INFRASTRUCTURE INDUCED DEGRADATION **1. Drainage line treatment** **2. Soil and water conservation**	• Soil loss during the construction of engineering structures and quarrying for stone and other materials • Siltation of water bodies downstream during the construction of engineering measures. • Maintenance of the structures will require additional responsibilities to the stakeholders. • Low quality constructions may lead to failure	• EC IF 9.1 • EC IF 9.2 • EC IF 9.3 • EC IF 9.4 • EC IF 9.5 • EC IF 9.6 • EC IF 9.7 • EC IF 9.8 • EC SC 2.1	• Conservation of soil measured by stabilized erosivity, gullies etc. • Reduction/increase in the frequency of slope slippages , debris flow, swollen streams, flash flood in downstream • Increase/decrease in water yield in the downstream sources and duration of water discharge • Increase/decrease in number of link paths

Subprojects/activities	Negative Impacts	Mitigation Measures	Monitoring Indicators
3. Link road **4. Storage facilities** **5. Marketing facilities**	and more hazards in downstream • Destabilization of the land and soil erosion/landslips along the road cuttings. • Siltation of water bodies downstream due to runoff. • Destruction of local flora during road construction and also along the roads. • Construction of the structures may cause some soil erosion. • Deterioration of cultural institutions (such as barter systems, helping attitude etc.)	• EC SC 2.2 • EC SC 2.3 • EC SC 2.4 • EC SC 2.5 • EC SC 2.6	• Availability/non-availability in off-season food products • Increase / decrease Productive land use for infrastructure • Improvement in incomes of vulnerable groups (child labour) and leisure time. • Increase /decrease in nutrition and education levels

Subprojects/activities	Negative Impacts	Mitigation Measures	Monitoring Indicators
INCOME GENERATING ACTIVITIES (IGA) 1. **NTFPS** 2. **Decorative items** 3. **Wood craft** 4. **Bamboo products** 5. **Nursery** 6. **Mushroom** 7. **Beekeeping** 8. **Fish farming** 9. **Woollen products**	• Conflict among the users over common resources • Chances of excessive harvest of a particular species / plant parts • Destabilization of stabilized slopes dug to remove soil for plant raising in the nursery • More demand for water for many IGA activities. • Risk of food poisoning due to unaware use of over grown / decayed mushroom. • Chances for economic risk due to death of fishes due to diseases. • Water pollution due to processing of wool for making products. • Possible occupational health hazards during wool processing.	• EC IGA 8.1 • EC IGA 8.2 • EC IGA 8.3 • EC IGA 8.4 • EC IGA 8.5 • EC IGA 8.6 • EC IGA 8.7	• Number of plants of different species raised • Increase/decrease in productivity. • Increase/decrease in income of beneficiary. • Participation of vulnerable groups in decision making at the watershed level.

Subprojects/activities	Negative Impacts	Mitigation Measures	Monitoring Indicators
AGRIBUSINESS **1-HYV cultivation** **2-Polyhouse** **3-Collection/Processing Canters**	• Increase in use of chemical pesticides/ insecticides. • Threat to local crops/species. • Exploitation of local shrubs and tree branches for staking purposes for climbers and tomato. • Spread of organic/inorganic waste like fruit peel, seeds, pulp and poly sheets etc. • Monoculture (of a particular Species or variety) results in decreased disease & pest resistant. • Threat to nutritional security of the area. • Air and water pollution by food processing units.	• EC AB 7.1 • EC AB 7.2 • EC AB 7.3 • EC AB 7.4 • EC AB 7.5 • EC AB 7.6 • EC AB 7.7 • EC AB 7.8 • EC ICM 4.1 • EC ICM 4.2 • EC ICM 4.3 • EC ICM 4.4 • EC ICM 4.5 • EC ICM 4.5.1 • EC ICM 4.5.2 • EC ICM 4.5.3 • EC ICM 4.5.4 • EC ICM 4.5.5 • EC ICM 4.5.6 • EC ICM 4.6 •	• Business plan with accordance to local climate/ conditions. • Species that are hardy and local. • Crop diversification. • Use of alternate staking material. • Arrangements for safe disposal of waste and controlling pollution in processing canters.

Subprojects/activities	Negative Impacts	Mitigation Measures	Monitoring Indicators
ALTERNATE ENERGY SOURCES	• Higher demand of water for bio-gas plants could create problems in the areas of water scarcity. • Chances of increased mosquito breeding at slurry outlet tank. • Hazard of accidents by leakage of methane gas. • In the households with bio-gas plants, the per day requirement would be higher. • Charring of pine needles would produce harmful smoke. • Fire hazard during charring. • Hazard of electric shock during the use of briquette moulding machine. • Pollution and health hazard through components of waste/unused batteries of solar equipments.	• EC AE 11.1 • EC AE 11.1.1 • EC AE 11.1.2 • EC AE 11.1.3 • EC AE 11.1.4 • EC AE 11.2.1 • EC AE 11.2.2 • EC AE 11.2.3 • EC AE 11.3.1	• Level of awareness to use alternate energy devices. • Quality standards and safety measures taken for establishment/use of biogas plant. • Disposal of inorganic waste.

Subprojects/activities	Negative Impacts	Mitigation Measures	Monitoring Indicators
SOCIAL MOBILIZATION / FORMATION OF COMMUNITY GROUPS			Maintenance of records for: • How many people of WWMC (including Women, SC, ST, transhumant, BPL and other vulnerable and weaker sections) attended the meeting. • Number of beneficiaries (including Women, SC, ST, transhumant, BPL and other vulnerable and weaker sections) • Whether every member of the beneficiary group is participating or not? • Increase/decrease in labour demand.

Annexure IX -Checklist for overall review of Draft Gram Panchayat Watershed Development Plan (GPWDP) by DPD and PD

DPD/PNGO will certify each GPWDP as the ESCP guidelines were completely followed during proposals of activities selected for implemented.

1. Is the GPWDP and the action plan for the transhumant violating laws, acts, regulations of Govt. of UA, Govt. of India and World Bank safe guards in any way?
2. Is the GPWDP and the action plan for the transhumant in conformity with the budget envelop designated for the Gram Panchayat and for the transhumant?
3. Has the GPWDP/action plan for the transhumant taken care of ES concerns and followed the ESA procedures?
4. Have adequate mitigative measures been undertaken for negative impacts?
5. Can some additional measures be considered by WWMC to further reduce or eliminate aforementioned negative impacts?
6. Does the GPWDP/action plan for nomdas create negative impact on any vulnerable group – women, BPL, SC, Tribal and transhumant communities, etc.?
7. Does the GPWDP/action plan for the transhumant provide opportunities to marginal groups in training and capacity building program?
8. Does the GPWDP promote any conflict among the communities residing within the Gram Panchayat and between Gram Panchayats?
9. Does the action plan for the transhumant create conflict with the Forest Department?
10. Does the GPWDP mention operation and maintenance mechanisms for assets developed under the project?
11. Are the provisions for monitoring and learning sufficiently elaborated in the GPWDP/action plan for the transhumant.

Annexure X List of Banned Pesticides

Aldrin	Benzene Hexa Chloride (BHC)
Calcium Cyanide	Chlordane
Copper acetoarbenite	Dibromocworopropane (DBCP)
Endrin	Ethyl Mercury Chloride
Ethyl parathion	Heptachlor
Manzona	Methomyl 24% Formulation
Nicotine Sulphate	Nitrofen
Paraquate dimethyl sulphate	Penta Choloro nitrobenzene
Penta cholorophenol (PCP)	Phenyl Mercury Acetate (PMA)
Sodium Methane Arsonate (MSMA)	Tetradifon
Toxaphene	Phosohamidon 85% SL
Methomyl 12.5% L	Aldicarb
Chlorbenzilate	Deildrin
Ethyl dibromide (EDB)	Maleic Hydrazide
Trichloro Acetic Acid (TCA)	Aluminium phosphamide
Carbofuran 505 WP	Captafal 80%
Malathian 25 DP & 50% EC	Methoxy ethyl mertcury chloride (MECE)

Extremely hazardous (Class Ia) technical grade active ingredients of pesticides (common name) not permissible in the project

Aldicarb	Difethialone	Parathion-methyl
Brodifacoum	Diphacinone	Phenylmercury acetate
Bromadiolone	Disulfoton	Phorate
Bromethalin	Ethoprophos	Phosphamidon
Calcium cyanide	Flocoumafen	Sodium fluroacetate
Captafol	Fonofos	Sulfotep
Chlorethoxyfos	Hexzchlorobenzene	Tebupirimfos
Chlormephos	Mercuric chloride	Terbufos
Chlorophacinone	Mevinphos	

Difenacoum	Parathion	

Highly hazardous (Class Ib) technical grade active ingredients of pesticides (common name) not permissible in the project

Acrolein	*Ethiofencarb*	Omethoate
Allyl alcohol	Famphur	Oxamyl
Azinphos-ethyl	*Fenamiphos*	Oxydemeton-methyl
Azinphos-methyl	Flucuthrinate	Paris green (C)
Blasticidin-S	Fluoroacetamide	Pentachlorophenol
Butocarboxim	Formetanate	*Pindone*
Butoxycarboxim	Furathiocarb	Pirimiphos-ethyl
Cadusafos	Heptenophos	Propaphos
Calcium arsenate	Isazofos	Propetamphos
Carbofuran	Isofenphos	Sodium arsenite
Chlorfenvinphos	Isoxathion	Sodium cyanide
3-Chloro-1, 2-prppanediol	Lead arsenate	Strychnine
Coumaphos	Mecarbam	Tefluthrin
Coumatetralyl	Mercuric oxide	Thallium sulphate
Zeta-cypermethrin	Methamidophos	Thiofanox
Demeton-S-methyl	Methidathion	Thiometon
Dichlorvos	*Methiocarb*	Triazophos
Dicrotophos	Methomyl	Vamidothion
Dinoterb	Monocrotophos	Warfarin
Edifenphos	Nicotine	Zinc phosphide

Moderately hazardous (Class II) technical grade active ingredients of pesticides (common name) not permissible in the project

Alanycarb	Endosulfan	Paraquat
Anilofos	Endothal-sodium	Pebulate
Azaconazole	Esfenvalerate	Permethrin
Azocyclotin	Ethion	Phenthoate
Bendiocarb	Etrimfos	Phosalone
Benfuracarb	Fenazaquin	Phosmet

Bensulide
Bifenthrin
Bilanafos
Bioallethrin
Bromoxynil
Bromuconazole
Bronopol
Butamifos
Butylamine
Carbaryl
Carbosulfan
Cartap
Chloralose
Chlordane
Chlorfenapyr
Chlorphonium chloride
Chlorpyrifos
Clomazone
Copper sulphate
Cuprous oxide
Cyanazine
Cyanophos
Cyflutrin
Beta-cyfluthrin
Cyhalothrin
Cypermethrin
Alpha-cypermethrin
Cyphenothrin
Deltamethrin
Diazinon
Difenzoquat
Dimethoate
Dinobuton
Diquat
Fenitrithion
Fenobucarb
Fenpropidin
Fepropathrin
Fenthion
Fenthin acetate
Fentin hydroxide
Fenvalerate
Fipronil
Fluxofenim
Formothion
Fuberidazole
Gamma-HCH
Guazatine
Haloxyfop
Heptachlor
Imazalil
Imidacloprid
Iminoctadine
Ioxynil
Ioxynil octanoate
Isoprocarb
Lambda-cyhalothrin
Mercurous chloride
Metaldehyde
Metam-sodium
Methacrifos
Methasulfocarb
Methyl isothiocyanate
Metolcarb
Metribuzin
Molinate
Nabam
Naled
phoxim
Piperophos
Pirimicarb
Prallethrin
Profenofos
Propiconazole
Propoxur
Prosulfocarb
Prothiofos
Pyraclofos
Pyrazophos
Pyrethrins
Pyroquilon
Quinalphos
Quizalofop-p-tefuryl
Rotenone
Sodium fluoride
Sodium hexafluorosilicate
Spiroxamine
Sulprofos
Terbumeton
Tetraconazole
Thiacloprid
Thiobencarb
Thiocyclam
Thiodicarb
Trizamate
Trichlorfon
Tricyclazole
Tridemorph
Vernolate
Xylylcarb

Annexure XI- List of permissible pesticides

Slightly hazardous (Class III) technical grade ingredients of pesticides (common name) permissible under IPM.

Acephate	Fluchloralin	Resmethrin
Acetochlor	Flufenacet	Sethoxydim
Acifluorfen	Fluoroglycofen	Simetryn
Alachlor	Flurprimidol	Sodium Chlorate
Allethrin	Flusilazole	Sulfluramid
Ametryn	Flutriafol	*Tebuconazole*
Amitraz	Fomesafen	Tebufenpyrad
Azamethiphos	Furalaxyl	Tebuthiuron
Bensultap	Glufosinate	Thiram
Bentazone	Hexzzinone	Tralkoxydim
Bromofenoxim	Hydramethylnon	Triadimefon
Butroxydim	Ipropenfos	Triadimenol
Chinomethionat	Isoprothiolane	Tri-allate
Chlormequat (chloride)	Isoproturon	Triclopyr
Chloroacetic acid	Isouron	Triflumizole
Chlorthiamid	Malathion	Undecan-2-one
Copper hydroxide	MCPA-thioethyl	Uniconazole
Copper oxychloride	Mecoprop	Ziram
Cycloate	Mecoprop-P	Cyhexatin
Mefluidide	Cymoxanil	Mepiquat
Cyproconazole	Metalaxyl	Dazomet
Metamitron	Desmetryn	Metconazole
Dicamba	Mthylarsonic acid	Dichlormid
Metolachlor	Dichlorobenzene	Myclobutanil
Dichlorophen	2-Napthyloxyzcetic acid	Dichlorprop
Nitrapyrin	Diclofop	Nuarimol
Dienochlor	Octhilinone	Diethyltoluamide
N-octylbicycloheptene	Difenoconazole	dicarboximide
Dimepiperate	Oxadixyl	Demethachlor
Paclobutrazol	Demethametryn	Pendimethalin

Demethipin	pimaricin	Dimethylarsinic acid
Pirimiphos-methyl	Diniconazole	Prochloraz
Dinocap	Propachlor	Diphenamid
Propanil	Dithianon	Propargite
Dodine	Pyrazoxyfen	Empenthrin
Pydridaben	Esprocarb	Pyridaphenthion
Etridiazole	Pyridate	Fenothiocarb
Pyrifenox	Ferimzone	Quinoclamine
Fluazifop-p-butyl	Quizalofop	

Technical grade active ingredients of pesticides unlikely to present acute hazard in normal use (common name) permissible in the project

Aclonifen	Acrinathrin	Alloxydim
Amitrole	Ammonium sulfamate	Ancymidol
Anthraquinone	Asulam	Atrazine
Azimsulfuron	Azoxystrobine	Benelaxyl
Benazolin	Benfluralin	Benfuresate
Benomyl	Benoxacor	Bensulfuron-methyl
Bifenox	Bioresmethrin	Biphenyl
Bispyribac	Bitertanol	Borax
Bromacil	Bromobutide	Bromopropylate
Bupirimate	Buprofezin	Butachlor
Butralin	Butylate	Captan
Carbendazin	Carbetamide	Chlomethoxyfen
Chloramben	Chloransulam methyl	Chlorbromuron
Chlorfluszuron	Chloridazon	Chlorimuron
Chlorothalonil	Chlorotoluron	Chlorpropham
Chlorpyrifos methyl	Chlorsulfuron	Chlorthal-demethyl
Chlozolinate	Cinmethylin	Cinosulfuron
Clofentezine	Clomeprop	Clopyralid
Cloxyfonac	Cryolite [C]	Cycloprothrin
Cyclosulfamuron	Cycloxydi	Cyhalofop

Cyromazine	Diamuron	Dalapon
Daminozide	Desmedipham	Diafenthiuron
Dichlobenil	Dichlofluanid	Diclomezine
Dicloran	Diclosulam	Diethofencarb
Diflibenzuron	Diflufenican	Dikegulac
Dimefuron	Dimethirimol	Dimethomorph
Dimethyl phthalate	Dinitramine	Dipropyl isocinchomerate
Dithiopyr	Diuron	Dodemorph
Ethalfluralin	Ethephon	Ethirimol
Ethofumesate	Etofenprox	Famoxadone
Fanarimol	Fenbutatin oxide	Fenchlorazole
Fenclorim	Fenfuram	Fenhexamid
Fenoxycarb	Fenpiclonil	Fenpropimorph
Fenuron	Fenuron-TCA	Ferbam
Flamprop	Flucarbazone-sodium	Flucyclozuron
Flufenoxuron	Flumetralin	Flumetsulam
Fluometuron	Flupropanate	Flupyrsulfuron
Flurenol	Fluridone	Flurochloridone
Fluroxypyr	Fluthiacet	Flutolanil
tau-Fluvalinate	Flopet	Fosamine
Fosetyl	Gibberellic acid	Glyphosate
Hexaconazole	Hexaflumuron	Hexythiazox
Hydroprene	Hymexazol	Imazamethabenzmethyl
Imazapyr	Imazapyr	Imazaquin
Imazethapyr	Imibenconazole	Inabenfide
Iprodione	Iprovalicarb	Isoxaben
Kasugamycin	Lenacil	Linuron
Maleic hydrazide	Manozeb	Maneb
Mefenacet	Mepanipyrim	Mepronil
Metazachlor	Methabenzthiazuron	Methoprene
Methoxychlor	Methyldymron	Metiram
Metobromuron	Metosulam	Metoxuron
Metsulfuron methyl	Monolinuron	2-(1-Naphthyl) acetamide
1-Naphthylacetic acid	Napropamide	Naptalam

Neburon	Niclosamide	Nicosulfuron
Nitrothal-isopropyl	Norflurazon	Ofurace
Oryzalin	Oxabetrinil	Oxdiazon
Oxine-copper	Oxycarboxin	Oxyfluorfen
Penconazole	Pencycuron	Pentanochlor
Phenedipham	Phenothrin	Phenylphenol
Phosphorus acid	Phthalide	Picloram
Piperonyl butoxide	Pretilachlor	Primisul furon
Probenazole	Procymidone	Prodiamine
Prometon	Prometryn	Propamocarb
Propaquizafop	Propazin	Propham
Propineb	Propyzamide	Pyrazolynate
Pyrazosulfuron	Pyrimethanil	Pyriminobac
Pyriproxyfen	Pyrithiobac sodium	Quinclorac
Quinmerac	Quinoxyfen	Pyrithiobac sodium
Quintozene	Rimsulfuron	Siduron
Simazine	Spinosad	Sulfometuron
Sulphur	Tebutam	Tecnazene
Teflubenzuron	Temephos	Terbacil
Terbuthylazine	Terbutryn	Tetrachlorvinphos
Tetradifon	Tetramethrin	Thiabendazole
Thidiazuron	Thifensulfuron-methyl	Thiophanate-methyl
Tiocarbzil	Tolclofos-methyl	Tolylfluanid
Transfluthrin	Triasulfuron	Tribenuron
Trietazine	Triflumuron	Trifluralin
Triflusulfuron-methyl	Triforine	Triticonazole
Validamycin	Vinclozolin	Zine

Annexure XII- Waste Management Guidelines for Processing Centres

Agriculture is the main source of income in Uttarakhand. Under Uttarakhand Decentralized Watershed Development Project initiatives has been taken for increases the incomes of rural inhabitants in selected watersheds through agribusiness. In order to facilitate the production of marketable produce, formation of FIGs was introduced to facilitate the production, processing and marketing of high value crops. To full fill the objectives project have been established Processing centers, LDP tank, Poly-house & Poly-tunnel. All these activities are intervened for the economic strengthen of rural inhabitants. At the same time, these activities also cause some organic and inorganic residue. According to the Environmental and Social Management Framework of the project, safe disposal of this residue is necessary. Therefore the organic and inorganic residue left over due to these active should be disposed-off /re-used as under.

Processing centers:

After processing of agro produce, Organic and Inorganic both type of waste material is available in the units. These are as follows.

Organic Waste:

- Bark & Seed of the Fruit.
- Pulp of Fruit and Vegetables
- Decayed Fruit, vegetables, Pulses etc.
- Waste water

Disposal /uses

All the organic waste should be re-used as compost for agricultural purposes. To convert the organic reduce into compost, a compost pit should be construct nearby each processing unit. The waste amassed during processing should collect in a pot and brought down to the compost pit. After decomposition, this material can be use as compost.

During processing, water us used massively for washing and other purposes. Thus proper drainage system should be assured in the processing units. The used water should be collected in a sock pit through a drainage pipe. So that, the waste water can percolates and recycled.

Inorganic waste

- Plastic /Glass Bottles, Packaging material
- Plastic Cans /Caps etc.

Disposal /uses

As far as possible the plastic cans and bottles should be re-used after proper washing. The damaged and unusable canes and bottles should be sanded for recycling. It is necessary to ensure that unused plastic/glass bottles, canes packing martial, sticker etc. should not spread over here & there in any situation.

Disposal of plastics waste from poly house / poly tunnel and LDP tanks

Under normal conditions the averages shelf life of the polyethylene sheets, used for poly houses and poly tunnels is 3-5 years. The low density polyethylene sheets used for LDP tanks can be used from 5-6 years. After that period the sheet itself become unusable. At this situation, after changing the older sheet by the new one, it should be given for recycling processes. It has to insure that the older sheet or its pieces should not be spread here & there in any condition.

Annexure XIII - ESMF trainings, monitoring and reporting

Annexure- XIII-a

DETAILS OF ESMF TRAINING CONDUCTED

Name of
Division

Date of Reporting

S No.	Name of GP	Date of Training	Orientation / Sensitization	Type of Training		
				Orientation	Refresher	Specific / Needbased

Annexure- XIII-b

Reporting Format for Application of ESMF Safeguard

Name of Division Year

Date of Reporting

S No.	Name of GP	Date of GP Plan Approval	Name of Activity (with benfeficiary name/ sites)	Status of Planning *				Status of Implementation		
				Possible negative impacts (Codes from Table -6)		Applicable ESCP (Annexure VII)	ESCP not followed (Annexure VII)	Not Started	In progress	Completed Satisfactorily
				Environmental (A-R)	Social (S-Z_2)					

* - Please use separate row for each code

Annexure- XIII-c

Consolidation of Application of ESMF Safeguards at Division level

Month
Divison Office

GP Name	Type of activity	ESCPs relevant	No. of sites	Nos. compliant	Nos. Deficient	Further ESCP/measures communicated by Division to GPs	Date for mitigation implementation			
							Target	Actual		

Annexure XIV- Consumption of popular chemical Fertilizers and Pesticides in the Project area as per the information received from State Agriculture Deptt., Uttarakhand

District wise consumption of Chemical Fertilizers (Yr 2012-13)

Sl. No.	District	Gross area Treatment with Fertilizer (ha.)	Urea	Nitrogen based (N) (In MT)	Phosphorus (P) (In MT)	Potassium (K) (In MT)
1	Almora	5320	4493	2277	0	304
2	Bageshwar	2978	3900	1810	41	0
3	Uttarkashi	1636	1033	487	30	0
4	Dehradun	31872	29846	13786	146	0
5	Tehri	386	830	382	0	0
6	Rudraprayag	2969	4115	1923	78	0
7	Pithoragarh	0	0	0	0	0
8	Pauri	2804	1419	656	9	6

District wise use of Chemical Pesticides (Yr 2011-12)

Sl. No.	District	Net cultivated area (ha.)	Pesticide Dust (Kg.)	Pesticide Liquid (Kg.)	Fungicide (Kg.)	Weedicide (Kg.)	Rat Killer (Kg.)
1	Almora	81940	11200	4851	1645	1720	161
2	Bageshwar	24454	3888	1624	983	3174	68
3	Uttarkashi	30761	5513	3654	6169	4690	190
4	Dehradun	46247	3804	5867	6229	10282	59
5	Tehri	61544	2802	1498	1246	1685	76
6	Rudraprayag	20655	5703	1612	814	89	50
7	Pithoragarh	42565	7833	4480	1495	44	184
8	Pauri	78220	6010	6665	3567	2072	608

Increase in value of major crops (Outcome indicator)

The overall increase in area and productivity is the weighted average of the increases for individual crops. The weights used are the average of pre and post project areas for each crop, expressed as a proportion of the combined area under all improved variety crops. The increase in value has been calculated by magnifying the increase in area by the corresponding increase in productivity and applying weights, as mentioned. This, therefore, captures the combined impact of area and productivity increases.

In symbols,

$$\Delta V = \sum_i \Delta a_i (1 + \frac{\Delta p_i}{100}) w_i$$

Where, ΔV = % change in value (weighted)

Δ ai = % change in area of crop i

Δ pi = % change in productivity of crop i

$$\text{wi} = \frac{ai}{\sum ai} \text{ (so that } \sum wi = 1)$$

In simple terms, this provides a way to assess the combined impact of area and productivity increases collapsing these into a single value.

The results of the agriculture outcome indicators are summarised in table 4.3.

Table 4.3 Agriculture Outcome Indicators

Outcome Indicator	Final Impact result
10% increase in area (ha) over baseline of improved varieties, high value crops	Area (ha) over baseline of improved varieties, high value crops increased by 21%
15% increase in net value of produce realized by farmers in treated areas	Net value of produce realised by farmers in treated areas increased by 27%

On the whole, the following reasons can be attributed to an increase in area and productivity of improved varieties:

- Traditional crops have been replaced by improved varieties particularly where irrigation facilities have been created
- Fallow land has been brought under cultivation particularly of improved varieties and high value crops wherever irrigation was available
- Un- irrigated land has been brought under irrigation and thereby under cultivation of improved varieties and high value crops
- Due to increased crop intensity the overall gross area under cultivation has increased
- On a few individual holdings repair of agriculture terraces have led to inclusion of abandoned cultivation in the cultivated area
- Availability of seed through the project as well as good market linkages have motivated farmers to grow cash crops

Impact of specific interventions

Table 4.4 below shows the increase factor of the households in the sampled villages who have adopted scientific agriculture interventions. The increase factor of compost pits has been 30 fold making it the most popular input to improve the quality of manure among the households. Adoption of improved seeds for agriculture and use of bio-fertilizer has also increased 10 fold. It was observed during field visits and group discussions that awareness generation among farmers has been undertaken through village level workshops, trainings and exposure visits regarding improved agricultural and horticulture practices and off-season vegetable cultivation.

The control villages did not report any significant adoption of inputs like bio fertilisers, improved seeds for vegetables and cash crops, improved variety of medicinal plants etc.

Table 4.4 Adoption of inputs

Adoption of inputs	% of hhs adopting (baseline)	% of hhs adopting (final)	Increase factor
Agriculture			
Improved agricultural seeds	5.42	57.24	9.56
Bio-fertilizer	1.64	17.31	9.54
FYM	97.69	99.62	0.02
Vermi-compost	0.77	2.56	2.33
Bio-pesticide	5.77	18.85	2.27
Compost pit	0.32	9.86	29.59
Vegetable and cash crops			
Improved seeds for vegetables and cash crops	8.03	59.56	6.42
Polyhouse*	0.46	1.78	2.87
Poly tunnel *	0.00	1.01	
Horticulture			
Improved variety plants for horticultural crops	7.12	39.90	4.60
Homestead programme	0.00	5.27	
Irrigation tank	1.14	7.33	5.45
Medicinal plants			
Improved variety of medicinal plants	0.00	0.05	

* These are provided both at individual and community levels, and also for demonstration purposes. As such, an estimation of individuals adopting these could not be obtained

Annexure XVII – Government Order for involvement of Van Panchayat in Reserve Forest

संख्या–3468 / X-2–2009–12(9)/2006 टी0सी0

प्रेषक,

नृप सिंह नपलच्याल
अपर मुख्य सचिव
उत्तराखण्ड शासन.

सेवा में,

1. प्रमुख वन संरक्षक,
   उत्तराखण्ड, देहरादून.
2. प्रमुख वन संरक्षक,
   ग्राम वन पंचायत एवं संयुक्त प्रबन्धन
   उत्तराखण्ड, नैनीताल.

वन एवं पर्यावरण अनुभाग–2 देहरादूनः दिनांक 02 नवम्बर, 2009

विषयः–वन पंचायतों द्वारा जल संरक्षण, संवर्द्धन एवं मृदा संरक्षण हेतु क्षेत्र उपचार का कार्य समीपस्थ आरक्षित वन क्षेत्रों में किये जाने के सम्बन्ध मे.

महोदय,

कृपया उपरोक्त विषयक अवगत कराया जाना है कि उत्तराखण्ड एक वन बाहुल्य, जैवीय विविधतायुक्त तथा पारिस्थितिकीय दृष्टि से अत्यंत संवेदनशील राज्य है, जिसका अधिकांश भाग पर्वतीय है। यहां की मिट्टी पथरीली एवं भूमि कटाव से प्रभावित है। अधिकांश नैसर्गिक जल स्रोत प्राकृतिक वनों में उपलब्ध हैं, जिनका उपयोग स्थानीय समुदाय द्वारा किया जाता है। मनुष्य तथा पशुओं के बढ़ते जैविक दबाव, प्राकृतिक संसाधनों यथा मृदा, जल एवं वनस्पति के अवैज्ञानिक दोहन एवं त्रुटिपूर्ण भू–उपयोग गतिविधियों को अपनाने के कारण परिस्थितिकीय तन्त्र पर प्रतिकूल प्रभाव पड़ा है, जिसके फलस्वरूप हमारी जीवनदायिनी नदियों के उच्च जलग्रहण क्षेत्रों एवं आरक्षित वनों में स्थित पेयजल स्रोतों का ह्रास हुआ है। यह सर्वविदित है कि प्रदेश में वन प्रबन्धन में वन पंचायतों के माध्यम से परम्परागत तौर पर सामुदायिक भागीदारी रही है। वन पंचायतों के प्रबन्धन हेतु प्रदेश में शासन द्वारा उत्तरांचल पंचायती वन नियमावली 2005 विज्ञप्त की गई है। इसके अनुसार वन पंचायतों का मुख्य उद्देश्य वन तथा पर्यावरण की सुरक्षा, संरक्षण एवं विकास में महत्वपूर्ण योगदान दिया जाना है। इन कार्यों के लिए वन पंचायतों को पृथक रूप से किसी भी कार्यदायी संस्था से धनराशि प्राप्त करने का अधिकार प्राविधानित किया गया है। वर्तमान

क्रमशः 2

Sr. S.A.

में मृदा एवं जल संरक्षण तथा संवर्द्धन की आवश्यकता को देखते हुए प्रदेश में विभिन्न विभागों यथा जलागम, कृषि, पेयजल, बैम्बू बोर्ड, बॉयोफ्यूल बोर्ड, ग्राम्य विकास एवं वन विभाग द्वारा क्षेत्र उपचार के विभिन्न कार्यक्रमों का कियान्वयन किया जा रहा है। भविष्य में भी प्रदेश की पेयजल एवं भू–क्षरण से जुड़ी समस्याओं के समाधान हेतु भावी परियोजनायें यथा मनरेगा, जलागम विकास (समान मार्गदर्शी सिद्वान्त–2008 के अन्तर्गत), बाह्य सहायतित परियोजनाओं, केम्पा द्वारा वित्त पोषित वानिकी परियोजनायें इत्यादि में भी इन गतिविधियों को स्थानीय ग्राम समुदाय के साथ सहभागिता के आधार पर कियान्वित किया जाना है। आरक्षित वनों के समीप निवास कर रहे ग्रामीण पारम्परिक रुप से चरान, चुगान अथवा जलौनी हेतु इन वनों पर आश्रित हैं। इन वनों में स्थित जल स्रोतों के संरक्षण एवं संवर्द्धन तथा मृदा संरक्षण सम्बन्धित कार्यो में स्थानीय समुदाय की वन पंचायतों के माध्यम से भागीदारी सुनिश्चत की जानी चाहिए।

2— अतः उपरोक्त परिप्रेक्ष्य में मुझे यह कहने का निदेश हुआ है कि निम्नलिखित शर्तों/प्रतिबन्धों के साथ वन पंचायतों द्वारा जल संरक्षण, संवर्द्धन एवं मृदा संरक्षण हेतु क्षेत्र उपचार का कार्य समीपस्थ आरक्षित वन क्षेत्रों में किया जा सकेगाः—

1. स्थानीय वन पंचायत सम्बन्धित ग्रामों से सटे हुए आरक्षित वन क्षेत्र में क्षेत्र उपचार का कार्य वन विभाग के प्रशासनिक नियंत्रण में करेगी। इस हेतु वन पंचायत का चयन संबंधित प्रभागीय वनाधिकारी द्वारा किया जायेगा।
2. वन पंचायत द्वारा उत्तरांचल पंचायती वन नियमावली 2005 के प्राविधानों के अनुरूप किसी भी परियोजना/कार्यदायी संस्था/विभाग से जल स्रोतों के संवर्द्धन, संरक्षण एवं क्षेत्र उपचार हेतु धनराशि प्राप्त की जा सकेगी।
3. वन पंचायत द्वारा क्षेत्र उपचार हेतु स्थलीय विकास योजना सम्बन्धित प्रभागीय वनाधिकारी एवं परियोजना अधिकारी के तकनीकी एवं वित्तीय मार्ग निर्देशन में तैयार की जायेगी।
4. स्थलीय विकास योजना सम्बन्धित प्रभाग/विभाग/कार्यदायी संस्था/प्रोजेक्ट के कार्ययोजना में दिये गये निर्देशों के अनुरूप होगी एवं सम्बन्धित प्रभाग के प्रभागीय वनाधिकारी वन संरक्षण अधिनियम, 1980 के प्राविधानों को ध्यान में रखते हुए स्थलीय विकास योजना अनुमोदित करेंगे।
5. स्थलीय विकास योजना में ऐसा कोई कार्य वन पंचायत अथवा सम्बन्धित परियोजना प्राविधानित नहीं करेंगे, जिससे वन संरक्षण अधिनियम, 1980 के किसी भी प्राविधान का उल्लंघन हो।

क्रमशः 3

6. आरक्षित वन क्षेत्रों के लिए अनुमोदित "स्थलीय विकास योजना" में चिन्हित कार्यों के सम्बन्ध में सम्बन्धित प्रभागीय वनाधिकारी द्वारा यथा—आवश्यकता विचलन विवरण तैयार कर प्रभाग की कार्य/प्रबन्ध योजना से होने वाले विचलन के सम्बन्ध में सक्षम स्तर से स्वीकृति/अनुमोदन प्राप्त कर लिया जायेगा।
7. क्षेत्र उपचार योजना का कियान्वयन स्थानीय वन पंचायत एवं सम्बन्धित प्रभागीय वनाधिकारी तथा सम्बन्धित परियोजना अधिकारी के मध्य एक अनुबन्ध के तहत संयुक्त वन प्रबन्धन के माध्यम से किया जायेगा। अनुबन्ध की शर्तों का अनुपालन उभय पक्षों द्वारा किया जायेगा। किसी एक पक्ष द्वारा अनुबन्ध की शर्तों का अनुपालन न किये जाने पर अनुबन्ध निरस्त कर दिया जायेगा तथा सम्बन्धित वन पंचायत एवं परियोजना/कार्यदायी संस्था/विभाग का कोई दावा/क्लैम नही होगा।
8. क्षेत्र उपचार हेतु अंतिम भुगतान सम्बन्धित (परियोजना/कार्यदायी संस्था/विभाग) के द्वारा वन विभाग/सम्बन्धित विभाग के अधिकृत अधिकारी के सत्यापन के बाद ही सम्बन्धित वन पंचायत को किया जायेगा। वन पंचायतों द्वारा किये गये व्यय का लेखा—जोखा नियमानुसार रखा जायेगा तथा इनके खातों का वार्षिक सम्परीक्षण (आडिट), भारत सरकार के महालेखा नियन्त्रक के द्वारा अधिकृत चार्टेड एकाउन्टेंट फर्म द्वारा किया जायेगा।
9. (क) कार्य सत्यापन तथा कार्य संचालन एवं कियान्वयन सम्बन्धित विभाग/परियोजना की निर्धारित गाईड लाईन्स के अनुसार ही Forest (Conservations) Act, 1980 एवं संगत अधिनियमों/नियमावली के प्राविधानों को ध्यान में रखते हुए किये जायेंगे। अधिनियम/नियमावली के किसी प्राविधान का उल्लंघन होने पर सक्षम स्तर से कार्यवाही की जायेगी।

(ख) कार्यदायी संस्था/परियोजना/सम्बन्धित विभाग द्वारा समय—समय पर वन पंचायतों द्वारा आरक्षित वन में करवाये जा रहे क्षेत्र उपचार का स्थलीय सत्यापन एवं अनुश्रवण वन विभाग को पूर्व में सूचित करने के उपरान्त किया जा सकेगा।

10. आरक्षित वन क्षेत्रों में वन पंचायतों द्वारा किये गये वृक्षारोपण की सुरक्षा का दायित्व परियोजना अवधि के अंतर्गत वन पंचायतों द्वारा वन विभाग के मार्ग निर्देशन में एन0ओ0यू0 के अनुसार किया जायेगा एवं इस उपचार क्षेत्र का ब्यौरा सम्बन्धित प्रभागीय वनाधिकारी द्वारा रखा जायेगा।

क्रमश : 4

11. सम्बन्धित आरक्षित वनों के उपचार क्षेत्रों में परियोजना अवधि के दौरान अवैध कटान, अवैध शिकार, वन अपराधों एवं अग्नि से सुरक्षा की पूर्ण जिम्मेदारी सम्बन्धित वन पंचायत की होगी।
12. आरक्षित वन क्षेत्रों में उपचार के अन्तर्गत किये गये कार्यों के सापेक्ष वन पंचायतों को भविष्य में उपचार क्षेत्र से वन उपज अथवा अन्य कोई लाभ अनुमन्य नहीं होगा।
13. राज्य स्तर पर प्रमुख वन संरक्षक, (वन पंचायत) एवं वन विभाग की ओर से अन्य सभी विभागों, परियोजनाओं इत्यादि से समन्वय का कार्य करेंगे।

कृपया तदनुसार यथावश्यक कार्यवाही सुनिश्चित करने का कष्ट करें।

भवदीय,

(नृप सिंह नपलच्याल)
अपर मुख्य सचिव

संख्या–3108 (1)/X–2–2009, तद्दिनांकित।

प्रतिलिपिः–निम्नलिखित को सूचनार्थ एवं यथावश्यक कार्यवाही हेतु प्रेषितः–

1. समस्त प्रमुख सचिव/सचिव, उत्तराखण्ड शासन।
2. मण्डलायुक्त, कुमाऊं मण्डल, नैनीताल/गढ़वाल मण्डल, पौड़ी।
3. समस्त जिलाधिकारी, उत्तराखण्ड।
4. निजी सचिव–मुख्य सचिव, उत्तराखण्ड शासन।

आज्ञा से,

02/12/09

(आर0के0मिश्र)
अपर सचिव

My Computer/D:/Ansari/ G.O. Letter 2009

07.12.09