

10. AGRICULTURE AND LIVELIHOOD SUPPORT PLAN

10.1 INTRODUCTION

Agriculture is the main source of livelihood for majority of inhabitants in the direct impact zone as well as in indirect impact zone of the Pancheshwar High Dam. Approximately 22,800 people (2,930 households) are expected to be physically and economically displaced due to the implementation of Pancheshwar High Dam. A total of 1,168.17 ha of farmland will be acquired to implement the PMP, out of which about 1,016 ha of farmland on the riverbanks in the Mahakali Valley will be submerged by the reservoir formed by the Pancheshwar High Dam.

In addition to permanent loss of arable lands, considerable physical infrastructure and facilities will also be lost as well; these includes main trails from the river crossing points to various places, irrigation and drinking water systems, health posts, service centers, market places, roads etc. The EIA report has explicitly recommended implementing sustainable livelihood enhancement measures for the affected communities of the project affected areas. Given the magnitude of impact and size of area affected a Detailed Environmental Management Plan is envisaged that includes number of sectorial plans to be prepared and implemented in order to mitigate the likely impacts of PMP on physical, biological and socio-economic environment of the project areas in general and enhancement of livelihoods of the affected communities in particular. Therefore, a comprehensive agriculture and livelihood support plan has to be prepared and implemented along with other plans within the DEMP.

Objectives of ALSP

The overall objective of the proposed Agriculture and Livelihood Support Program (ALSP) is to design and implement a comprehensive package of supports for the PMP affected communities, particularly to those who inhabit the project affected areas. The specific objectives of the proposed ALSP are to:

- Rehabilitate/strengthen basic agriculture and livestock extension services to the project affected communities;
- Mitigate adverse agricultural impacts of the project;
- Scaling up of environmental friendly agricultural production and farming systems such as Slopping Agricultural Land Technology (SALT), Agro-forestry and organic farming;

- Support affected communities to undertake intensive agriculture and livestock production systems where feasible;
- Support communities in value chain development of potential commodities and marketing of high crops for improved food security and livelihood;
- Support to develop productive community infrastructures such as micro and non-conventional irrigation technologies, low-cost storage facility, marketing facility etc.;
- Develop and implement suitable alternative livelihood options for the small, marginal and landless households;
- Strengthen capacity of community for undertaking market driven agriculture production and marketing system; and
- Capacity development of Local Resource Persons (LRP), farmers and other stakeholders for enhancing agricultural production in the project affected areas.

Expected Outcomes of ALSP

Upon successful implementation of proposed ALSP for recommended period of 10 years, following outcomes will be achieved:

- Basic agriculture and livestock extension services to the communities of project affected areas improved through rehabilitation and strengthening Agriculture/Livestock Services Centers/Sub-centers at appropriate locations;
- Reduced adverse impacts of the project on agriculture through implementation of suitable mitigation measures;
- Environmental friendly agricultural production and farming system such as Stopping Agricultural Land Technology (SALT), Agro-forestry and Organic farming demonstrated and scaled up;
- Improved basic community infrastructures and productive assets in the areas for intensification of agriculture and livestock production, value chain development and marketing such as micro and non-conventional irrigation technologies, low-cost storage facility, marketing facility etc.
- Improved agriculture and livestock productivity and production through introduction and promotion of intensive crops and livestock production systems where feasible;
- Developed value chains of potential agriculture and livestock commodities such as sweet orange, ginger, turmeric, coffee, milk, meat, eggs etc.
- Improved food security and livelihoods of project affected families in the project areas through increased farm production and value chain development of selected high value agricultural commodities;
- Gainful self-employment or wage employment opportunities created for poor, small, marginal and landless households through implementation of market oriented short-term vocational and skills training and necessary supports; and
- Local institutional capacity developed and strengthened for undertaking market driven sustainable agriculture production and marketing system.

10.2 DETAILED ENVIRONMENTAL MANAGEMENT PLAN

Proposed DEMP comprises of set of sectorial plans for mitigating the potential environmental (physical, biological, socio-economical) impacts of PMP in its command areas. Among other sub-sectors, agriculture is one of the major sub-sectors that will be highly affected by proposed project. Therefore, it has been proposed a comprehensive agriculture and livelihood support plan for enhancing the livelihoods of affected households through implementation of comprehensive agriculture and livelihood support programs within the DEMP framework.

The agriculture and livelihood support plan is an integral part of DEMP prepared for supporting the project-affected families. The ASLP describes in detail about the minimum support services provisioned to the affected farming communities of indirect impact zone to improve the livelihoods through increased agriculture production and incomes.

The study has identified potential areas for interventions for improving the overall productivity of agriculture in the indirect impact zone. The key areas of interventions proposed in the ALSPP are described below:

10.2.1 Intensification of Food Crop Production

The present field survey indicates that overall productivity of major food crops including paddy, maize, wheat and millets, potato are very low compared to other similar hills regions. The study reveals that about 40 per cent households in the project-affected areas have been producing foods adequate for more than six months. Therefore, there is high potential for increasing the production of food crops through suitable crop intensification measures such as provision of irrigation, application of new crop production technology and supply of inputs such improved seeds, fertilizers and manures, crop protection measures, marketing infrastructure for the project affected communities. Estimated potential areas for intensive cereal crops production has been presented in Table 10-1.

Table 10-1: Potential area for intensive cereal production

S N	VDC	Rice/Wheat	Maize/Wheat	Total
		Production (ha)		
1	Dasarathchand Municipality	200	800	1,000
2	Uku	300	100	400
3	Lali	300	200	500
4	Gokuleshwor B	200	200	400
5	Rudreshwar	200	100	300
6	Sarmauli	200	200	400
7	Gokuleshwor D	100	100	200
8	Pancheshwar	100	100	200
9	Dethala	100	100	200
10	Amchaur	300	400	700
11	Giregada	100	100	200
12	Dattu	100	100	200
13	Sitad	200	300	500
14	Bohorigaun	200	200	400
15	Rim	300	400	700
16	Dadakot	100	200	300
17	Rithachaupata	300	400	700
18	Nwali	100	200	300
19	Kharkada	200	300	500
20	Rodidewal	100	200	300
21	Kulau	100	200	300
22	Dilasaini	100	300	400
23	Shankarpur	100	200	300
	Grand total	4,000	5,400	9,400
	Percent of Areas	22.16	29.91	52

Present study shows that intensive cereals production program could be implemented in 23 VDCs as shown in Table 10-1. Based on physiographic characteristics of lands including climate, elevation, and soils types of the indirect impact zone about 52 per cent of the cultivated areas could be used for intensive production of cereals (Rice and Wheat in 4,000 ha) and Maize and Wheat in 5,400 ha).

10.2.2 Promotion of Potential Cash Crops/Enterprises

Given the agro-ecological conditions, expected local demands and needs for improving the livelihoods of project affected households, few farm-based commodities could be developed as cash crop enterprises. These are briefly described below:

Fresh vegetable production

The field study shows that most of the irrigated flat/low lands in the project areas would be sub-merged with construction of dam and limited irrigated Khet lands will left out for farming. However, most of these low lands are accessible and brought under seasonal and off-season vegetables production for catering to the increased local demands for fresh vegetables. In some of the pockets along the highway, few farmers have already been producing fresh vegetables though in small scale and reported to be earning good income. Therefore, there is high potential for promoting fresh vegetables in the selected pocket areas affected by the project. Estimated areas potential for production of fresh vegetables and seeds has been presented in Table 10-2.

Table 10-2: Potential areas for vegetation and other cash crop production

SN	VDC	Winter	Summer	Off-season	Total
		Production (ha)			
1	Dasarathchand Municipality	100	50	40	190
2	Uku	100	40	10	150
3	Lali	100	40	10	150
4	GokuleshworB	100	50	20	170
5	Rudreshwar	50	20	10	80
6	Sarmauli	50	20	10	80
7	GokuleshworD	100	20	10	130
8	Pancheshwar	50	20	10	80
9	Dethala	50	20	10	80
10	Amchaur	50	20	10	80
11	Giregada	50	20	10	80
12	Dattu	50	20	10	80
13	Sittad	50	20	10	80
14	Bohorigaun	50	20	10	80
15	Rim	25	20	10	55
16	Dadakot	25	20	10	55
17	Rithachaupata	25	20	0	45
18	Nwali	25	20	0	45
19	Kharkada	25	20	0	45
20	Rodidewal	25	20	0	45
	Grand total	1,100	500	200	1,800
	Percent of areas	6.09	2.77	1.11	9.97

Present study shows that limited areas are potential for intensive vegetables production in the indirect impact zone. It is estimated at least one type of vegetable could be produced in

20 VDCs as shown in Table 10-2. Based on physiographic characteristics of lands including climate, elevation, and soils types of the indirect impact zone about 10 per cent of the cultivated areas could be used for intensive vegetable production (winter vegetables in 1100 Ha, summer vegetables in 500 Ha and Off-season vegetable in 200 Ha) in 20 VDCs of indirect impact zone.

Vegetable seeds production

Given the agro-climatic conditions, wide altitudinal ranges extending from sub-tropical to temperate climates, the area is highly potential for organic production of seeds of various vegetables like Cole crops (Cabbage, Cauliflower, Broccoli, Spinach, etc.), Radish, Green peas, Mustards, and many more crops since the farmers have not been applying any chemical fertilizers and pesticides in the conventional crops they have been producing. Therefore, a small-scale vegetable seeds production and marketing program could be developed as viable enterprise for the small and marginal farmers who do not have enough lands for production of cereals and vegetables at commercial scale for their livelihoods

Apiculture

It was observed during the field study that the entire project affected areas are highly suitable for commercial Apiculture. The natural environment, particularly the forest diversity, land use patterns and farming systems in the areas are highly conducive for production of improved Apiculture. Interactions with farmers, concerned district stakeholders reveals that some efforts have been made to demonstrate the improved bee-keeping in the areas by providing Improved Bee-hives and training to leader farmers. However, the efforts made so far are very limited in and around district headquarters. Therefore, adequate provision has been made in ALSP to provide necessary support to small and landless families to undertake bee-keeping as one of the IGAs for improving the livelihoods in PMP areas.

Fruit production

It was observed that most of project affected areas lie in the sub-tropical and temperate climatic zones and most of the sub-tropical fruits such as Citrus fruit species like, Sweet Orange, Mandarin, Lemon, Guava, Pineapple, Bananas, Amla, Avocado, Kiwi etc. and temperate fruit species like Apple, Walnuts, Peach, Plums etc could be grown. It was observed that there is a government horticulture farm at Satbanjh, Baitadi mandated for promotion of temperate fruits development in the region. However, the Horticulture Farm has not been managed well and farmers are not been able take advantage from this farm. The existing Horticulture Farm should be strengthened to produce adequate fruits samplings and providing basic support services to the farmers affected by the project. Therefore, adequate provisions have been made in ALSP for promotion of Horticulture in the far-western region in general and project affected areas in particular. Estimated area potential for fruit production has been presented in Table-8.3.

Present study shows that at least one type of fruit could be grown in all 26 VDCs as shown in Table 10-3. It is estimated that about 10 percent of cultivated private lands will be brought under fruit production in 26 VDCs of indirect impact zone. Based on physiographic characteristics of lands including climate, elevation, and soils types of the indirect impact zone selected tropical species of fruits (Mango, litchi, jack fruit, banana, pineapple, papaya, guava, etc.), could be grown in 500 ha followed by subtropical species (Orange, sweet orange, mandarin, pomegranate, lemon, etc.) in 1,000 ha and temperate fruits (Apple, walnut, plum, pears, peach and etc.) in 310 ha.

Table 10-3: Potential area for fruit production

SN	VDC	Tropical	Sub-Tropical	Temperate	Total
		Production (ha)			
1	Dasarathchand Municipality	50	200	20	270
2	Uku	50	40	0	90
3	Lali	25	40	0	65
4	Gokuleshwor B	25	40	0	65
5	Rudreshwar	25	50	10	85
6	Sarmauli	25	50	5	80
7	Gokuleshwor D	25	40	0	65
8	Pancheshwar	25	25	0	50
9	Dethala	25	40	5	70
10	Amchaur	25	40	20	85
11	Giregada	25	20	50	95
12	Dattu	25	20	20	65
13	Sittad	25	40	0	65
14	Boharigaun	10	20	20	50
15	Rim	20	40	20	80
16	Dadakot	10	20	0	30
17	Rithachaupata	25	40	5	70
18	Nwali	10	20	20	50
19	Kharkada	10	40	5	55
20	Rodidewal	10	20	20	50
21	Bhagawati	10	20	20	50
22	Kulau	10	25	20	55
23	Dilasaini	5	40	20	65
24	Shankarpur	5	20	10	35
25	Nagarjun	0	10	10	20
26	Shree Kedar	0	40	10	50
	Grand total	500	1,000	310	1810
	Percent of areas	2.77	5.54	1.72	10.03

Floriculture

Although the project-affected area seems to be suitable for growing a wide range of sub-tropical and temperate flower, various aromatic flowering species, none of these species currently exist. The field study shows that the local communities are not aware of cultivation of these species either in the cultivated lands or growing in the natural environment in this area. Therefore, there is thin possibility of commercial production and value chain development of the floriculture in the near future. However, some of common flower species that will have exponential demands in the local markets during and after the construction of project have been prioritized in the proposed ALSP. Among others, small-scale production of seasonal flowers, different varieties of Roses, Gladiolus, etc. that can be marketed as cut-flowers needs to be promoted at suitable sites. Adequate provision has been made in the proposed ALSP for promotion of floriculture in the areas.

10.2.3 Livestock and Poultry Farming

Livestock and poultry are integral part of subsistence farming system in the project-affected areas. However, present study reveals that both the number of households keeping livestock and poultry in the project affected areas have been declining sharply due to various reasons. Given the local demand for milk, meat and eggs there is high potential for introduction of improved livestock and poultry farming in the selected pockets in the project districts.

10.3 PROPOSED ALSP PROGRAMS

In order to create an enabling environment for the project affected communities for undertaking suitable farming practices and alternative livelihood options set of activities need to be implemented to provide adequate supports to all the households that will be affected directly or indirectly from the proposed PMP. Given the nature of the livelihood patterns of the project affected households in the areas, both land based Income Generating Activities (IGAs) and off-farm micro-enterprise development support programs need to be designed and implemented. The details of proposed ALSP activities have been summarized below.

10.3.1 Rehabilitation/Strengthening of Productive Infrastructures/Services

The formation of reservoir results in submergence of agriculture related infrastructures agriculture. For instance the Agriculture Service Centre (ASC) and Livestock Service Centre (LSCs) – responsible to provide essential extension services – will be submerged and need to be relocated. Furthermore, these infrastructures need to be made more efficient so that agricultural productivity remains same or improved in compared to the current situation despite the project impacts. Therefore, the agriculture infrastructures of the project area are proposed for rehabilitation and strengthening, Table 10-4 lists such infrastructures.

Table 10-4: Infrastructure proposed for rehabilitation/strengthening

SN	Infrastructure	Unit	Target
A.	Rehabilitation/Strengthening of Resource/Service Centers		
1	Agriculture/Livestock Service Centers	#	4
2	Strengthening of Satbanjh Horticulture Center, Baitadi	#	1
B.	Rehabilitation/Construction of Community Infrastructures		
1	Irrigation Schemes/Canals	#	20
1.1	Irrigation Ponds	#	250
1.2	Rainwater Harvesting Systems	#	2,000
1.3	Sprinkler Irrigation Systems	Set	1,000
2	Marketing/Collection Centers	#	5
3	Community/Cooperative Building	#	10
4	Cooperative Milk Chilling Centers	#	5
5	Cooperative Coffee Processing Centers	#	2
6	Cooperative Honey Processing Center	#	2
7	Cellar Cold Stores	#	20

10.3.2 Technical Assistance to the Farm Families

In order to compensate the negative impacts of the project on agriculture production and overall farming systems in the indirect impact zone the community will be provided all possible necessary technical assistance to improve the agricultural farming system with introduction of suitable technological packages. Based on the prevailing agro-climatic characteristics of the areas, socio-economic conditions of the communities and emerging market opportunities for farmers comprehensive packages of interventions will be provided.

The key area of interventions for enhancing agriculture production and livelihoods improvement of the affected families has been summarized Table 10-5.

Table 10-5: Technical assistance to farmers

SN	Areas of Technical Assistance/Supports	Unit	Target
A	Community Organization and Mobilization		
A1	Community Awareness Programs	VDC	26
A2	Formation/Strengthening Farmers Groups	FGs	100
A3	Registration/Strengthening of Farmers Cooperatives	Cooperative	20
A4	Capacity Development of Local CBOs/NGOs	NGO/ CBO	10
B	Institutional Capacity Development for Farmers Organizations/Networks		
B1	Group Management Training for Members of Farmers' Groups	Person	200
B2	Cooperative Management Training for Members of Cooperative	Person	40
B3	Cooperative Account Keeping Training	Person	40
B4	Business Plan Preparation Training for Cooperatives members	Person	40
B5	Cooperative Marketing Management Training for Project Staff and Members of Cooperatives	Person	40
B6	Training on Community Organization and Social Mobilization for Partner NGOs/CBOs and Project Staff	Person	80
B7	Training on Integrated Pest Management for LFs	Person	80
C	Value Chain Development and Marketing		
C1	Honey Bee	Nos.	1
C2	Citrus Fruits	Nos.	1
C3	Milk and Milk Products	Nos.	1
C4	Coffee	Nos.	1
C5	Ginger and Turmeric	Nos.	1
C6	Vegetable Seeds	Nos.	1
D	Intensive Food Production		
D1	Community based seed production of rice, wheat, maize & millets	# FGs	100
D2	Seed Production of Vegetables and Spices Crops	# FGs	40
D3	Fruits and Fodder Nurseries	# FGs	26
D4	Goat Resources Centers Establishment and Management	# FGs	12
D5	Pig Resource Centers Establishment and Management	# FGs	6

10.3.3 Off-farm IGA/Micro-enterprise Development Support Activities

Although the number of completely landless households in the project affected areas of the PMP is very less (<5%), but the average landholding size very small and the overall quality of the cultivated lands for majority of the households, particularly in the indirect impact zone is very poor in all VDCs. As a result, the overall livelihood condition of the households is very poor due to low productivity of cultivated land. Therefore, majority of the households in the project areas have been earning their subsistence living by either exchanging unskilled labors with foods or cash or migrating temporarily to urban areas, mostly to India for temporary wage employments. Various studies conducted by different agencies in Nepal show that provision of short-term market oriented skills development and vocational training to the members of those landless families create ample opportunities for securing good wage employment both within the country or they could be self employed by

establishing own micro-enterprise in the village and urban areas. Therefore, it is imperative to provide suitable short-term skill development and vocational training to at least one member of the poorest among the poor households of the project affected area free of cost as per the CTEVT policy of the government of Nepal. Number of youths proposed to be trained by skill development training by trade is presented in Table 10-6.

Table 10-6: Number of persons to be trained by trade

S N	Potential skills areas/Trade	Unit	Target	Rate/Unit	Total
				NRs. 000	
A	Occupational Skills Enhancement Training				
1	Brick Laying Mason	Person	200	30	6,000
2	Leather Shoe Making	Person	20	30	600
3	Black Smith Workshop	Person	20	30	600
4	Sewing and Tailoring	Person	40	30	1,200
	Sub-total		280		8,400
B	New Emerging Skills Trades				
1	Light Vehicle Driving	Person	100	30	3,000
2	Building Electrician	Person	40	30	1,200
3	House Wiring	Person	100	30	3,000
4	Plumbing	Person	100	30	3,000
5	House Painting	Person	100	30	3,000
6	Motor Cycle Repairing	Person	40	30	1,200
7	Mobile Repairing	Person	100	30	3,000
8	Welding/Mechanics	Person	100	30	3,000
9	Biogas Mason	Person	40	30	1,200
10	Hair Cutting	Person	20	30	600
11	Beautician	Person	40	30	1,200
12	Carpentry/Furniture Making	Person	40	30	1,200
13	Tile/Marble Laying	Person	40	30	1,200
	Sub-total		760		25,800
	Total		1040		34,200

Moreover, lots of employment opportunities for different categories of skilled manpower will be created by the PMP during its construction period and operational phase. In order to help the youths (18 to 40 years) of the project affected areas, a wide range of skill development training will be provided so that they will get employment in the project on priority basis.

About 280 persons will be trained in occupational trades like brick laying, leather shoe making, sewing and cutting and Hammer and Blow profession (Black Smith) in the village.

10.4 TYPE AND VOLUME OF INPUTS REQUIRED

In order to implement the proposed ALSP under the DEMP considerable inputs such as improved seeds, seedlings/saplings and materials and equipment will be required. Different types of seeds and planting materials required for intensive crop production in indirect impact zone have been estimated and summarized in Table 10-7.

Table 10-7: Estimated quantity of materials and equipment required

SN	Material/Inputs	Volume	Unit	Remarks
A	Crop Intensification			
1	Certified Seeds			
1.1	Paddy	80	MT	Improved seeds of crops distributed only once.
1.2	Maize	400		
1.3	Wheat	162		
1.4	Millets	80		
1.5	Potato	160		
1.6	Soybean	160		
	<i>Sub-total</i>	<i>1,042</i>		
2	Cash Crops			
2.1	Winter Vegetables	6	MT	Annually required
2.2	Summer Vegetables	2		
2.3	Off-season Vegetables	1		
	<i>Sub-total</i>	<i>9</i>		
3	Spices Crops			
3.1	Ginger	160	MT	Distributed only once
3.2	Turmeric	80		
3.3	Coriander	1		
	<i>Sub-total</i>	<i>241</i>		
B	Inputs/materials			
1	Improved Bee-hives	200	Set	
2	Plastic Tunnel for Off-season vegetable Production Demonstration	200		
3	First Aid Veterinary Kits	60	Number	
4	Improved Breeding Stocks			
4.1	Buffalo Bulls	20	Number	
4.2	Cow Bulls	40		
4.3	Buck	200		
4.4	Pig	20		
4.5	Chicken/Cock	100		

10.5 IMPLEMENTATION OF DEMP

10.5.1 Implementation approach

The proposed DEMP needs to be implemented in a phased manner in order to provide adequate supports to the project affected households and to enhance their livelihoods without creating any adverse environmental impacts both during and after the construction of PMP. The proposed DEMP shall be implemented in following three distinct phases:

- Inception phase
- Implementation phase
- Post construction or follow up phase

10.5.2 Institutional setup

Given the scope and nature of the DEMP, the existing legislative and policy governing the sectorial approach of environmental conservation and development may not be effective. Therefore, a separate comprehensive EMP Department shall be constituted under the Pancheshwar Development Authority (PDA) under a separate Act for construction and operation of PMP. A separate unit – ALSP unit - shall form within the Department for effective implementation of the project ALSP.

10.5.3 ASLP team

Implementation of proposed DEMP requires a highly committed team of multi-disciplinary team of professionals drawn from various discipline representing, Agriculture, Fisheries, Horticulture, Forestry, Livestock, Engineering, Environment, Socio-economics, Micro-enterprises etc. However, the sectorial plans embedded within the DEMP could be implemented either directly by PIU constituted by the project or in partnerships and collaboration with local partners identified suitable for local level. In general, the DEMP shall be implemented in a better participatory manner involving all relevant stakeholders at each level. The roles and responsibilities of each partner involved in the implementation process will be defined and necessary resources including human resources will be planned for effective and efficient use of scarce resources allocated in the plan.

10.5.4 Potential Agro-based Industrialization

The PMP project areas are underutilized from agricultural development perspective and overall productivity of land, labor and available natural resources including water, climates have not been utilized at present. However, most of the areas affected by PMP are potential for commercial cultivation of selected high value crops and agro-based small-scale industries could be established. Among others, following agro-industries will be established in PMP affected areas:

- a. Small-scaled Dairy processing at both district headquarters of Baitadi and Darchula;
- b. Juice factory of Orange/Mandarin,
- c. Coffee production and processing,
- d. Commercial Apiculture and Honey processing plant in Baitadi district,
- e. Vegetable seeds production, processing and marketing and
- f. Oils extracting from Chiuri in Baitadi district

10.5.5 Implementation Schedule

The proposed DEMP implementation plan explicitly describes the goals, objectives, expected outcomes/results, outputs and nature of activities to be implemented for achieving the anticipated goal of the DEMP and resources required for implementation of DEMP for about 15 years' time frame. The LASP should be implemented in three –phases namely: i) Inception phase; Implementation phase; and Follow Up phase. The tentative ALSP implementation schedule has been presented in Table 10-8.

Table 10-8: Proposed ALSP Implementation Schedule

S N	Major Activities/Phase	Unit	Target	Implementation Phase/year (15 years)						
				Inception					Implementation	Follow Up
				1	2	3	4	5		
				5 years						
1	Establishment of DEMP Implementation Office	No.	1							
	Recruitment of necessary project staffs	Person	As required							
	Rehabilitate ASC/LSCs	Nos.	4							
2	Community awareness and organization in 26 VDCs	VDC	26							
3	Organization of beneficiary households into Groups	Group	100							
4	Identification and prioritization of infrastructures to be rehabilitated/constructed in IIZ VDCs	VDC	26							
5	Detailed design and cost estimates of the infrastructures to be rehabilitated/constructed	Nos.	As required							
6	Livelihoods needs assessment of each Groups formed	VDC	26							
7	Identify and prioritize the Agriculture/livestock and other livelihoods intervention packages for each group	Group	100							
8	Identify and assess collaborators/partners for implementing the prioritized interventions package	Nos.	As required							
9	Develop partnership /collaboration mechanisms with selected partners/ collaborators at district/VDC levels.	Nos.	As required							
10	Prepare capacity development plan for Farmers' Groups and collaborating partner organizations.	No.	1							
11	Conduct capacity development programs for farmers' organizations and local collaborating partners	Event	As required							
12	Implementation of capacity development programs for beneficiary farming households	Event	As required							
13	Arrangement/Supply of necessary inputs (seeds, breeds and planting materials for establishment of resource centers)	M Ton	1,292							
14	Implementation of intensive crop production programs	ha	9,400							

S N	Major Activities/Phase	Unit	Target	Implementation Phase/year (15 years)						
				Inception					Implementation	Follow Up
				1	2	3	4	5		
				5 years						
15	Vegetables and cash crop production programs	ha	1,800							
16	Identification of suitable areas, and households for establishment of Multipurpose Nurseries, Goat Resource Centers, Pig Breeding and Multiplication of crop seeds in the VDCs.	Nos.	As required							
17	Selection of sites for plantation of fruits, coffee, and other spices crops in the VDCs	Ha	1,810							
18	Provide necessary training to selected farmers and members of groups	Persons	360							
19	Conduct value chain study for potential commodities	Nos.	6							
20	Detailed cost estimates for establishment of Agro-processing and marketing centers	Nos.	12							
21	Provide technical, materials and financial assistance for establishment of Agro-based industries	Nos.	6							
22	Conduct need assessment for providing vocational and skills development training to youths	Times	1							
23	Conduct vocational and skills development training in collaboration with Training Providing Institutions/Agencies	Person	1,040							
24	Conduct exchange visits/observation tours	Person	560							
25	Monitoring and Reporting									
	Regular monitoring of activities at VDC level	Times	12 × 60							
	Prepare monthly/Quarterly/ Annual Progress Reports	Times	85							
	Conduct regular staff meeting on monthly/Quarterly/Annual basis	Times	85							
	Organize Annual program planning and review meeting with implementing partners and farmers' representatives	Times	5							
26	Mid-term Evaluation	Times	1							
27	Final Evaluation	Times	1							

10.5.6 Monitoring and Evaluation Plan

A detailed Monitoring and Evaluation Plan for ALSP needs to be prepared for effective implementation of proposed activities for achieving the objectives of DEMP. The monitoring indicator for proposed ALSP has been summarized in Table 10-9.

Table 10-9: Indicators for Monitoring the ALSP

S N	Hierarchy of objective	Objectively Verifiable Indicators (OVI)	Means of verification
1	Goal: Improve overall livelihoods of project affected communities	# of project affected households directly benefited from ALSP activities.	Baseline and End line survey
2	Objectives		
2.1	Increase production and productivity of crops and livestock in indirect impact zone	Annual production of major crops of households	Crop cutting survey
2.2	Increase income of project affected families	Annual incomes of beneficiary households	Annual monitoring report
2.3	Promote sustainable farming practices for improving environmental conditions of PMP project areas	Areas covered with perennial tree species like fruits, fodder and other cash crops	Land use survey of area
2.4	Support project affected households to improve livelihoods through increased agricultural production and employment opportunities	Number of beneficiary households undertaking suitable IGA through project support	Monitoring report
3	Outputs		
3.1	Basic agriculture and livestock extension services to the communities of project affected areas improved.	Number of ASC/LSC/Resource Centers rehabilitated/strengthened; Number of technical staffs working in their assigned office.	Activity completion report
3.2	Reduced adverse impacts of the project on agriculture through implementation of suitable mitigation measures	Proportion of cultivated areas covered by improved crops/ livestock production technologies Proportion of land covered with plantation of perennial crops	Annual monitoring report
3.3	Environmental friendly agricultural production and farming system such as Stopping Agricultural Land Technology (SALT), Agro-forestry, and Organic farming demonstrated and scaled up.	Proportion of beneficiary households adopting SALT, Agro-forestry and Organic Farming practices.	Annual monitoring report
3.4	Improved basic community infrastructures and productive assets in the areas for intensification of agriculture and livestock production, value chain development and marketing such as micro and non conventional irrigation technologies, low-cost storage facility, marketing facility etc.	Number of collection/ marketing centers rehabilitated/ established; Number of irrigation schemes rehabilitated/ constructed; Number of low-cost storage facility constructed and operated	Activity completion and monitoring report
3.5	Improved agriculture and livestock productivity and production	Proportion of beneficiary households adopted	Annual Monitoring Report

S N	Hierarchy of objective	Objectively Verifiable Indicators (OVI)	Means of verification
	through introduction and promotion of intensive crops and livestock production systems where feasible.	improved agriculture/livestock technologies;	
3.6	Developed value chains of potential agriculture and livestock commodities such as sweet oranges, ginger, turmeric, coffee, milk, meat, eggs etc.	Number of value chains developed; Number of households directly benefited from the value chains development and marketing.	Monitoring report
3.7	Improved food security and livelihoods of project affected families in the project areas through increased farm production and value chain development of selected high value agricultural commodities.	Percentage of HHs food self sufficient; Annual cash incomes of beneficiary households from sales of agricultural commodities.	Periodic monitoring report
3.8	Gainful self employment or wage employment opportunities created for poor, small, marginal and landless households through implementation of market oriented short-term vocational and skills training on and necessary supports	Number of youths trained by trade; Number of trained youths gainfully self-employed or employed gainfully in or outside PMP	Training completion report. Annual Monitoring report
3.9	Local institutional capacity developed and strengthened for undertaking market driven sustainable agriculture production and marketing system.	Percentage of beneficiary households members of Groups/Cooperatives; Number of Farmers Groups/ Cooperatives undertaking commercial production and marketing of crops and livestock products	Annual monitoring report

10.6 ESTIMATED COSTS

The cost for proposed ALSP has been estimated based on current prices for the goods and services required for implementing the activities. The cost estimates include the costs incurred for rehabilitating all the productive infrastructures such as Agriculture and Livestock Service Centers/Sub-centers, irrigation systems and canals, agricultural markets/collection centers destroyed in the inundated areas and additional infrastructures required for promotion of commercial crops and livestock production, processing and marketing in the indirect impact zone of the PMP.

The cost estimates also include the costs for technical assistance to farmers, materials and equipment supports for undertaking the potential Income Generating activities (both on-farm and off-farm enterprises for enhancing livelihoods of the beneficiary households of 26 VDCs affected by the project. Total estimated costs for implementation of Agriculture and Livelihood Support Plan (ALSP) for five years is NRs. 657.30 million for five years. The item-wise estimated costs have been summarized in Table 10-10.

Table 10-10: Estimated costs for ALSP component of DEMP

S N	Major Cost Items	Unit	Target	Rate/ Unit	Total
				NRs. (000)	
A	Rehabilitation/Strengthening of Resource/Service Centers				
A 1	Rehabilitation/Strengthening of ASC/LSCs	Nos.	4	5,000	20,000
A 2	Strengthening of Satbanjh Horticulture Center, Baitadi	Nos.	1	10,000	10,000
	Sub-total A				30,000
B	Rehabilitation/Construction of Community Infrastructures				
B 1	Irrigation Schemes/Canals	#	20	5000	100,000
B 1.1	Irrigation Ponds	#	250	100	25,000
B 1.2	Rainwater Harvesting Systems	#	2000	50	100,000
B 1.3	Sprinkler Irrigation Systems	Set	1000	20	20,000
B 2	Marketing/Collection Centers	#	5	2,000	10,000
B 3	Community/Cooperative Building	#	10	2,000	20,000
B 4	Cooperative Milk Chilling Centers	#	5	5,000	25,000
B 5	Cooperative Coffee Processing Centers	#	2	5,000	10,000
B 6	Cooperative Honey Processing Center	#	2	3,000	6,000
B 7	Cellar Cold Stores	#	20	100	2,000
	Sub-total B				318,000
C	Support to Farmers for Improving Agricultural Productivity				
C 1	Increased food Production				
C 1.1	Distribution of Certified Seeds of cereals	HH	14000	2	28,000
C 1.2	Vegetables Production	HH	3000	2	6,000
C 1.3	Fruits production	HH	3000	3	9,000
C 1.4	Spices crops	HH	1000	5	5,000
C 1.5	Mushroom Production	HH	100	50	5,000
C 1.6	Bee-keeping	HH	1000	10	10,000
	Sub-total C 1		9,100		63,000
C 2	Livestock and Poultry Production				
C 2.1	Livestock Production Programs	HH	4000	20	80000
C 2.2	Poultry and Pig Production	HH	700	20	14000
C 2.3	Pasture and Fodder Development	HH	4000	5	20000

S N	Major Cost Items	Unit	Target	Rate/ Unit	Total
				NRs. (000)	
	<i>Sub-total C 2</i>		8,700		114,000
C 3	Animal Breeds Improvement				
C 3.1	Buffalo bulls distribution	Nos.	20	50	1,000
C 3.2	Cattle Bulls distribution	Nos.	40	50	2,000
C 3.3	Breeding bucks distribution/exchange	Nos.	200	10	2,000
	<i>Sub-total C 3</i>				5,000
C 4	Resource Centers Development				
C 4.1	Establishment/Operation of Multipurpose Fruits/Fodder Nurseries	Nos.	20	200	4,000
C 4.2	Goat Breeding Resource Centers	Nos.	10	200	2,000
C 4.3	Improved Bee-hives Multiplication	Nos.	10	200	2,000
	<i>Sub-total C 4</i>				8,000
C 5	Animal Health Improvement				
C 5.1	Vaccination of Animals	Nos.	30,000	0.1	3000
C 5.2	Veterinary Medicines for SCs	Nos.	4	100	4,000
	<i>Sub-total C 5</i>				7,000
C 6	Value Chain and Market Study				
C 6.1	Honey Bee	Nos.	1	500	500
C 6.2	Citrus Fruits	Nos.	1	500	500
C 6.3	Milk and Milk Products	Nos.	1	500	500
C 6.4	Coffee	Nos.	1	500	500
C 6.5	Ginger and Turmeric	Nos.	1	500	500
C 6.6	Vegetable Seeds	Nos.	1	500	500
	<i>Sub-total C 6</i>				3,000
C 7	Capacity development of farmers and their organizations/networks				
C 7.1	Farmers training and visits				
C 7.1.1	Farmers training on improved intensive cereals crop production	# Events	50	50	2500
C 7.1.2	Farmers training on vegetables production	# Events	20	50	1000
C 7.1.3	Farmers Training on Fruits Production	# Events	10	50	500
C 7.1.4	Training on Mushroom production	# Events	10	50	500
C 7.1.5	Farmers' Field School on Summer Vegetables	Pockets	20	300	6000
C 7.1.6	Farmers' Field School on Winter Vegetables	Pockets	20	300	6000
C 7.1.7	Farmers' Field School on Off-season Vegetables	Pockets	10	300	3000
C 7.1.8	Spices and Cash Crops Production	# Events	10	50	500
C 7.1.9	IPM Training on Fruits	# Events	5	300	1500
C 7.1.10	Integrated Soils Nutrient management	# Events	5	50	250
	<i>Sub-total C 7.1</i>				21750
C 7.2	Farmers Training on L/stock & Poultry				
C 7.2.1	Dairy	# Events	5	100	500
C 7.2.2	Goat	# Events	5	100	500
C 7.2.3	Pig	# Events	2	100	200
C 7.2.4	Poultry	# Events	3	100	300
C 7.2.5	Village Animal Health Workers	Person	50	30	1,500
C 7.2.6	Farm Yard Manure/Compost Making	# Events	26	50	1,300

S N	Major Cost Items	Unit	Target	Rate/ Unit	Total
				NRs. (000)	
C 7.2.7	Multipurpose Nursery Management	Person	50	15	750
C 7.2.8	Bee-keeping Management Training	Person	100	15	1,500
	<i>Sub-total C 7.2</i>				<i>6,550</i>
C 7.3	Vocational and Skills Development Training for Youths				
C 7.3.1	Occupational skills development raining for selected occupational caste groups	Person	280	30	8,400
C 7.3.2	Market Oriented Short-term Skills Development Training for Youths	Person	760	30	22,800
	<i>Sub-total C 7.3</i>		<i>1040</i>		<i>31,200</i>
C 7.4	Exposure Visits	Person			
C 7.4.1	Intra Project Visits to Farmers' Groups/Cooperative Members	# Groups	100	10	1,000
C 7.4.2	National Exposure Visits to Leader Farmers and Project Staff	Person	40	20	800
C 7.4.3	Visits to Relevant Projects In India	Person	20	30	600
	<i>Sub-total C 7.4</i>		<i>160</i>		<i>2,400</i>
	<i>Sub-total C (1 + 2 + 3 + 4 + 5 + 6 + 7)</i>				<i>258,300</i>
D	Community Organization/Strengthening of Farmers Groups Networks				
D 1	Formation/Strengthening Farmers Groups	#	100	10	1,000
D 2	Registration/Strengthening of Cooperatives	#	20	100	2,000
D 3	Institutional Strengthening CBOs/NGOs	#	10	100	1,000
	<i>Sub-total D</i>				<i>4,000</i>
E	Capacity Development of Farmers Organizations/Networks				
E 1	Group Management Training for Members of Farmers' Groups	Person	200	10	2,000
E 2	Cooperative Management Training Cooperative Members	Person	40	15	600
E 3	Cooperative Account Keeping Training for Cooperative Members	Person	40	15	600
E 4	Business Plan Preparation Training for Members of Cooperatives	Person	40	15	600
E 5	Market Management Training for Staff and Cooperative Members	Person	40	15	600
E 6	Training on Community Organization and Social Mobilization for Partner NGOs/CBOs and Project Staff	Person	80	15	1,200
E 7	Training on Local Resource Persons (LRP)	Person	20	20	400
	<i>Sub-total E</i>		<i>360</i>		<i>6,000</i>
F	Human Resources/Technical Assistance				
F 1	Expert Human Resource	MM	180	120	21,600
F 2	Support Services	MM	1400	30	42,000
F 3	Out of Pocket Expenses	Year	5	1,000	5,000
	<i>Sub-total F</i>				<i>68,600</i>
	<i>Grand total (A +B + C + D + E + F)</i>				<i>657,300</i>

10.6.1 Partnerships, Funding Strategy and Institutional Set up

As per the nature and scope of proposed ALSP, activities will be implemented in close coordination with concerned government district line agencies like District Agriculture Development Office, District Livestock Service Office, Division Irrigation Office, Division Cooperative Office, District Women Development Office, District Soils Conservation Office, DDCs, VDCs and collaboration with various other stakeholders working in the districts. A detailed program implementation guidelines need to be developed for effective collaboration with concerned agencies in each project district.

Total funds required for implementation of ALSP is much higher than regular sectorial programs budget allocations by Government in the district. Therefore, it is suggested that Government should make provision for adequate financial resources for implementation of ALSP either in the regular sectorial district development plan or request external funding agencies like ADB, WB, IFAD, EU for necessary supports. The far western region as a whole is on high donor priority for donor investments for improving food and nutritional security of the people of the region.

In order for effective implementation of the proposed ALSP, a core technical team of experts should be provisioned for with DEMP implementation team. Following expert and support staffs should be recruited for implementing the plan:

Professional Experts

- a. Agriculture Expert
- b. Livestock/Pasture and Fodder Expert
- c. Value Chain Development and Marketing Expert

Support Staffs/Technicians

- a. Agriculture JT/JTA – 4
- b. Livestock/Veterinary JT/JTAs – 4
- c. Social Mobilizers – 12
- d. Messengers -2