CHAPTER-1: INTRODUCTION

1.1 Background

Nepal Electricity Authority (NEA) is constructing a 220 kV transmission line from Bharatpur to Bardaghat in Nepal to strengthen the power transmission network of Integrated Nepal Power System (INPS), thereby increasing the capacity of power flow from the west where the major generating stations exist or planned to the east where the demand is high. The line particularly enhances the existing Bharatpur-Bardghat sector which is of single circuit configuration only and has been constructed with limited capacity in early seventies when the power system was in nascent stage. This will also help enhance the power exchange with India.

The proposed alignment passes through Bharatpur Municipality of Chitwan district and 14 VDCs of Nawalparasi district. The estimated length of the transmission line is 73.5 Km. Right of Way (RoW) of the transmission line is 30m (15m on each side of centerline) and each tower will require an average area of 12.5mx12.5 m. A total of 0.673 ha private land will be acquired by the project for the placement of 43 towers.

The SIA has been prepared in compliance with GoN legislation, The World Bank policies, guidelines and best practices. The Bank policies emphasize the need to avoid or minimize involuntary resettlement on development projects. This SIA of Bharatpur- Bardghat 220 kV Transmission Line Project has been prepared based on the review of available literatures, collection of the secondary VDC level data, findings of household survey of affected households and inventory of affected private and public assets.

1.2 Objectives of the Study

The main objective of the study is to assess adverse social impacts of the transmission line project and prepare a SIA to address the adverse social impacts:

The specific objectives of this study are:

- Establish socioeconomic and cultural baseline conditions of the project area,
- Identify beneficial and adverse social impacts of the project,
- Analyze the critical impacts,
- Propose mitigation measures for the adverse social impacts,
- Prepare social monitoring plan including organizational and institutional requirement, and
- Provide information to the decision makers regarding further action and about the social implications due to the development of the proposed project.

1.3 Scope of the Study

The scope of the proposed study is to identify the households affected by the tower pads and structures falling in RoW, conduct household survey, stakeholder consultation at key localities, identify the likely impacts and develop mitigation measures including Resettlement and Rehabilitation Plan. The study for SIA preparation has covered all the areas defined as project affected areas in Chapter 3.

1.4 Layout of the Report

This SIA contains 13 chapters. Chapter 2 contains project description, Chapter 3 outlines the study methodology, Chapter 4 provides information on resettlement policy and legal framework, Chapter 5 describes about community consultation and grievance redress mechanism, Chapter 6 details socio-economic condition of the project area. Chapter 7 details impact assessment, Chapter 8 includes mitigation and enhancement measures, Chapter 9 details institutional arrangement, Chapter 10 describes implementation schedule, Chapter 11 includes monitoring and evaluation and Chapter 12 details mitigation and enhancement cost, source of funding, budgetary process and timing of expenditure whereas Chapter 13 includes conclusion.

CHAPTER-2: PROJECT DESCRIPTION

2.1 Project Location

The proposed project is located in Chitwan and Nawalparasi districts of Nepal (Fig. 2.1). Physiographically, the proposed transmission line falls under the *Inner Terai* (the *Dun Valleys*), the *Sub-Himalaya* (the *Siwaliks* or the *Churiya Hills*), and the *Indo-Gangetic Plain* (the actual *Terai Plain*) of the Central and the Western Development Region of Nepal. The *Dun valley*, which is bounded by the Siwalik range, includes the western Chitwan and the north-eastern part of Nawalparasi in the project area. East-West Highway is the main access to the project area. Some part of the alignment is accessible through existing feeder roads of concerned districts. Airline service is available in Bharatpur, Chitwan district.

2.2 Transmission Line Route

The proposed 220 kV Bharatpur- Bardaghat Transmission Line is 73.5 km in length. The TL starts from the proposed New Bharatpur substation located at Aanptari, Bharatpur Municipality, Chitwan district and terminates at existing Bardghat substation located at Makar VDC in Nawalparasi district (Fig-2.2). The project covers one municipality of Chitwan district and 14 VDCs of Nawalparasi district. The detail route alignment map is given in Appendix-I.

The major portion of the transmission line alignment crosses the forest area (79.19%) followed by cultivated land (18.38%) and rivers, roads & rocky areas (2.43%).

While selecting the transmission line alignment, due consideration has been given to avoid the settlement areas, inbuilt structures, religious places, schools and other community infrastructures as far as possible.

2.3 Project Features

The proposed transmission line will be double circuit. Each line circuit will have three phases, each phase comprising two Aluminum Conductor Steel Reinforced (ACSR) sub-conductors. Double circuit towers with vertical formation will typically have an average height of 45 m and the typical tower base dimensions will be 12.5 m x 12.5 m. Steel tower leg and body extensions will be utilized to

reduce foundation excavation on slopes and provide greater tower foundation structural security. The design span between tower structures is 350 m.

Right of Way (RoW) of the transmission line is 30m (15m on each side of centerline). The transmission line design features are given below.

Salient Features

Project:	Bharatpur-Bardghat 220kV Transmission Line Project
District:	Chitwan and Nawalparasi
VDC/ Municipality:	Bharatpur Municipality; Amarapuri, Devchuli, Dhaubadi, Dibyapuri, Dumkibas, Gaindakot, Makar, Mukundapur, Nayabolan, Rajahar, Shiva Mandir, Tamsariya, Parsauni and Deurali VDCs
Line Length:	73.5 kilometers
Span:	350 meters
No. of Tower:	256 (out of which 43 are located in cultivated land)
Private land to be acquired for Tower: 0.673 ha	
Voltage level:	220 kV
RoW:	30 meters
Minimum ground clearance of wires: 7.5 meters	
Tower type:	Steel Lattice Structure, self supported
Tower Height (typical):	42.45 meters
Circuit:	Double
Conductor:	ACSR BISON, Duplex
Insulator:	Cap and Pin type
Earthwire:	in double peaks (EHS 7/3.35 and OPGW)
Foundation Type:	Pad and Chimney
Foundation Area:	12.50 x 12.50 meters (Typical approximate per tower)
Project Cost:	USD19 million
Funding Agency:	GoN/NEA/World Bank

2.3.1 Line Towers

Line towers shall be of double circuit configuration, i.e., having place for two separate sets of electrical conductors, to enhance the long-term reliability and capacity of the transmission line that will be carrying large chunks power over long distances.

The transmission line shall be constructed with self-supported lattice galvanized steel towers. The types of towers as per the anchoring requirements will be four, i.e., suspension, tension, angle and dead-end.

2.4 Construction Planning

The Construction works of the Project will essentially consist of the following activities:

a. Foundation works

b. Erection of transmission towers.

c. Wire stringing

e. Testing and commissioning.

2.4.1 Concrete Foundation

Excavation for tower foundations will be made to the size and depth required by design. Concreting for the foundations will be performed after proper placement of reinforcing bars. After necessary curing, the foundations will be backfilled with suitable material. Suitable protection to the tower foundations, such as gabion walls, will be provided where required.

2.4.2 Erection of Galvanized Steel Towers

Galvanized steel lattice towers will be manufactured in the factory and transported to the individual tower locations from the nearest road points. After foundation is complete and minimum days allowed for strength gaining, towers are erected. Erection will be done manually by employing pulleys, wenches, etc.

2.4.3 Insulator Fittings, Conductor and Ground Wire Stringing

Conductors, ground wires, insulators and necessary accessories will be carried manually to the tower locations from the nearest road heads. Stringing of ground conductors will be carried out manually. Conductors will be strung mostly by using machines.

2.4.4 Construction Personnel

During the initial stages of the construction of the transmission line, only a small number of construction personnel will be required. Altogether 250 people will be deployed during the construction of the project, which includes 150 unskilled, 60 semi skilled and 40 skilled manpower. Most of the unskilled manpower will be hired local.

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2.4.5 Transportation

Primary site access for the project construction will be gained from the East-West Highway. No permanent access roads will be constructed to tower sites from existing road. Existing feeder roads and tracks will be used for construction and maintenance as per need. The construction material up to the nearest road head will be carried out through vehicle and latter it will be transported manually up to the individual tower location.

2.4.6 Spoil Dumping Site

Since the construction of transmission line towers requires clearing and excavation of fairly small areas at tower locations, construction work will not require spoil dumping sites. The spoil will be filled up and compacted in the tower base area.

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2.4.7 Construction Materials

The materials required for civil construction works related to the transmission line and substation will be:

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a. Steel reinforcement
b. Cement
c. Coarse aggregate
d. Fine aggregates (sand)

Steel reinforcing bars and cement will be purchased from local manufacturers or imported as per the supply situation. Coarse aggregates will be produced at site from excavated materials or purchased from the nearby market. Likewise, fine aggregates will be collected from major quarries along riverbanks, the excavated foundation material can be used as a backfill material required for the foundation construction.

2.4.8 Project Duration

The estimated duration of the project is 2 years. The construction work of transmission line will primarily be carried out during the dry season when ground conditions are essentially dry and river flows low to allow easy movement of materials and construction of towers. Construction activities during the monsoon season will primarily be restricted to stringing of conductors, although this activity may also be restricted by the weather.

CHAPTER-3: STUDY METHODOLOGY

3.1 General

The methodology adopted to collect data on socio-economic and cultural aspects for the SIA has included but not limited to: literature review, survey of affected households (HHs), participatory rapid appraisal (PRA) in the affected VDCs, focus group discussions (FGDs), market survey in the affected VDCs, field observation and informal discussion/meeting with district level government officials. Based on the literature review, field data as well as detailed census survey of affected households and inventory of affected private/public assets, this SIA has been prepared.

The study team has adopted a participatory approach with maximum involvement of different stakeholders of the project at the local and district levels to collect relevant information for the SIA. The study team has maintained close contacts with the relevant district level government offices, VDC level key stakeholders and other stakeholders while conducting the fieldwork for the SIA.

The following methodology has been applied to collect social, economical and cultural data for the SIA.

3.2 Project Area Delineation

Based on the review of maps, technical survey and field assessment for the SIA of the proposed TL project, the project area is defined as the area for the construction of a 220 kV transmission line alignment as well as the area that will be impacted due to the construction and operation of the project.

The project area includes 14 VDCs of Nawalparasi district (Amarapuri, Devchuli,Dhaubadi,Dibyapuri,Dumkibas,Gaindakot,Makar,Mukundapur,Nayabolan,Rajahar,Shiva Mandir, Tamsariya, Deurali and Parsauni) and 1 municipality (Bharatpur) of Chitwan district. The study area is divided into two parts on the basis of the proximity and magnitude of impacts as follows.

3. 2.1 Core Project Area

The “Core Project Area” consists of the 30 m Right of Way (RoW), encompassing 15 m on each side of the alignment measured from its center line. This area is defined as the direct impact zone.

3.2.2 Surrounding Area

The term ''Surrounding Area'' indicates a wider area, which will be directly or indirectly influenced by the construction and operation of the project. This area includes all alignment encompassing VDCs/municipality of the 2 districts excluding areas mentioned as core project area. This area is also termed as the “indirect impact zone”.

3.3 Literature Review

Relevant literature including survey report, publication of Central Bureau of Statistics, profile of District Development Committees (DDCs), SIA and other relevant documents/reports related to transmission line project were collected and reviewed extensively to collect required data/information for the SIA. The following publications were particularly collected and reviewed to prepare the RAP:

- Population of Nepal, Population Census 2001, Central Bureau of Statistics, Government of Nepal in Collaboration with UNFPA Nepal, 2002.
- Population of Nepal, Population Census 2001, Selected Tables on Caste/Ethnicity, Mother tongue, and Religion, Central Bureau of Statistics, Government of Nepal 2002.
- District profiles of concerned District Development Committees.
- Village Development Committee Profile of Nepal.
- Collection and review of National Plans, Policies, Acts and Rules related to social impacts and other loses especially the land acquisition, compensation and resettlement.
- Review of The World Bank Safeguard Policies

3.4 Identification of the Stakeholders and Consultations

The stakeholders were identified by the study team with the help of representatives of district level government offices (District Development Committee, District Administration Office, District Forest Office, District Health Office and District Agriculture Development Office) and representatives of local government bodies (VDC), nongovernmental organizations (NGOs), community based organizations (CBOs) teachers and other key informants of the area.

The identified key stakeholder are project affected families (PAFs), affected communities/groups, vulnerable groups, representatives of local government bodies/line agencies, NGOs, CBOs, community forestry user groups (CFUGs), women organization, teachers and political party.

The identified stakeholders were consulted to solicit their views, concerns regarding the project and their expectations from the project as they are the directly or indirectly affected by the project and have important role to influence the project implementation.

3.5 Preparation and Finalization of Study Tools

After review of relevant reports and documents, study tools for SIA were prepared to collect required information/data from the field. The survey tools used in SIA study of other transmission line projects conducted by NEA for World Bank have been used for this project also.

3.6 Mobilization of Supervisors and Enumerators

Local qualified enumerators and supervisors with previous experience in similar type of work (Social Survey of Hetauda -Bharatpur 220 kV T/L project) were hired for the survey. It has eased the survey process by their familiarity to the area, people and local languages. Gender balance and ethnic diversity was maintained while hiring the field composition. Altogether 2 Supervisor and 6 local enumerators (3 male and 3 female) were locally hired for field study.

3.7 Sample Distribution

The SIA study has covered 12 VDCs of Nawalparasi district. The transmission line passes only through forest area in the remaining 2 VDCs (Prasauni and Deurali VDC) of Nawalparasi district and Bharatpur municipality of Chitwan district where no private land will be affected. Therefore, social survey has not been conducted in these areas. Altogether 13 PRAs, census of 105 affected households, 10 market surveys, 7 FGD and 5 KIS have been conducted in the project area (Table 3.1).

Table 3.1: Sample Distribution

S.No.	VDCs/Municipality	Surveyed Households	Market Survey	PRA	FGD	KIS
1	Amarapuri	17	1	1		
2	Devchuli	7	1	1	1	1
3	Dhaubadi	2	0	0		
4	Dibyapuri	3	1	1		
5	Dumkibas	16	1	1	1	1
6	Gaindakot	3	1	1		
7	Makar	10	1	1	1	1
8	Mukundapur	17	1	2	2	1
9	Naya Belhani	6	0	1	1	1
10	Rajahar	4	1	1		
11	Shiva Mandir	18	1	2	1	
12	Tamsariya	2	1	1		
	Total	**105**	**10**	**13**	**7**	**5**

3.8 Fieldwork

The fieldwork for SIA was conducted during 14 -24 October 2011 under the close supervision and guidance of the Sociologist /Resettlement Expert and Community Liaison Expert. Additional field work was conducted by Sr. Sociologist during 10 - 20 January 2012 to make additional consultation in key localities of the alignment. A tentative field schedule and reporting formats for SIA was provided to the field team to ease the reporting process and maintain uniformity of the reports.

3.9 Census of Directly Affected Households and Structures

The families whose land or property or both are acquired by the project are defined here as the project affected family (PAFs). Altogether, 108 households will be affected due to the implementation of the proposed project. Of these, 46 households will be affected by acquisition of land for tower pads and 62 households will be affected by acquisition of structures including cowshed, toilet, kitchen etc.

Of the total affected households, 105 households (43 affected by towers and 62 affected due to structures relocation) were surveyed to collect socio-economic baseline information. 3 households were missing during field survey, and hence, could not be enumerated. The household-survey was carried out in 12 VDCs of Nawalparasi district.

Census survey of 105 households (whose land, house, cowshed, toilet, kitchen will be acquired for tower pads and houses/structures to be relocated) was conducted to collect socioeconomic data and issues/concerns of the affected households. The household census was conducted using a semi-structured household survey questionnaire (Appendix-II).

3.10 Participatory Rapid Appraisal

Altogether 13 Participatory Rural Appraisals (PRA) were conducted in 11 VDCs affected by the project to collect basic socio economic information, views, concerns and expectation of the local people from the project. Similarly, the participants were also informed regarding the project and its activities during the PRA. During the PRA meetings there were no gender and caste/ethnic discrimination for the participation. Altogether 158 participants representing different caste/ethnic groups, members of the project affected households, former VDC Chairman, VDC Secretary, school teacher, businessmen, farmer, student, social workers and representatives of women organizations, NGOs, CBOs, political parties etc. participated in the PRA meetings. The average number of participants in each PRA was 12.15 persons. A checklist was used to facilitate the PRA meeting.

The participation ratio of the male and the female is 62.03% and 37.97% respectively. Furthermore, Hill-Brahmin/Chhetri, Tamang, Dalits, Gurung, Tharu and Magar are the dominant caste/ethnic

groups that participated in the meetings. A checklist was developed and used to facilitate the PRA (Appendix-II).

Table 3.2 Details of the PRA

Date	Location	VDCs	Number of Participants		
			Total	Male	Female
15 Nov. 2011	Mukundapur-2 Malpur	Mukundapur	10	6	4
14 Nov. 2011	Mukundapur-5 Bhaisekhori	Mukundapur	16	9	7
14 Nov. 2011	Gaidakot-1, British Camp	Gaindakot	14	10	4
16 Nov. 2011	Amarapuri-3 Mejhi	Amarapuri	9	7	2
16 Nov. 2011	Rajahar-8 Satghare	Rajahar	11	7	4
17 Nov. 2011	Dibyapuri-9, Mirtung	Dibyapuri	12	6	6
19 Nov. 2011	Naya Belhani-7, Tandi	Naya Belhani	13	7	6
19 Nov. 2011	Tamsariya-5 Tareni	Tamsariya	13	4	9
17 Nov. 2011	Shiva Mandir-8, Koilapani	Shiva Mandir	12	8	4
18 Nov. 2011	Shiva Mandir-9, Hasaura	Shiva Mandir	7	4	3
17 Nov. 2011	Devchuli-7, Mudabas	Devchuli	14	10	4
19 Nov. 2011	Dumkibas-2, Suntandi	Dumkibas	15	12	3
20 Nov. 2011	Makar-9 Banda Khola	Makar	12	8	4
-	-	**Total**	**158**	**98**	**60**
-	-	**Percentage**	**100**	**62.03**	**37.97**

3.11 Focus Group Discussion

Seven FGD was conducted focusing the affected families at key settlements of the transmission line alignment. The FGD mainly focused on the specific issues of the affected community, training and assistance required by the project and community development program, if any, required by the local communities. Altogether 124 people including 86 male and 38 female participated in the meetings (Table 3.3).

Table 3.3 Details of FGD

Date	Location	VDC	Number of Participants	Remarks

			Total	Male	Female	
Jan. 12, 2012	Bhedabari-3	Mukundpur	10	6	4	
Jan. 12, 2012	Bhaisakhori-5	Mukundpur	10	2	8	
Jan. 13, 2012	Hasaura	Shiva Mandir	40	30	10	Refused to put signature
Jan. 13, 2012	Mudabas	Devchuli	11	9	2	
Jan. 14, 2012	Tandi	Nayabelhani	11	8	3	
Jan. 15, 2012	Suntandi	Dumkibas	30	22	8	Signed but opposing the alignment
Jan. 16, 2012	Banda Khola	Makar	12	9	3	
		Total	**124**	**86**	**38**	

3.12 Key Informant Survey

Five Key Informant survey was conducted in the project area covering different community and groups. The information such as dependency on natural resources, settlement pattern of Dalit and vulnerable group, specific social and cultural tradition of these groups, attitude of people towards the project and major concerns were collected through KIS.

3.13 Market Survey

Market survey in the 10 project VDCs was conducted to collect prevailing market price of consumption goods, construction materials, wage rate, land price etc. A market survey checklist was prepared and used to conduct the market survey.

3.14 Meetings/Consultations

Informal meetings/consultations were also conducted with the relevant government officials (CDO, LDO, VDC Secretary), NGOs, CBOs, CFUGs of the project districts to collect information about the project area, their concerns/expectation and inform them about the project and its ongoing activities.

3.15 Data Encoding and Analysis

The field-supervisors were responsible for proper collection of all the required information. Collection of missing information or correction of data inconsistency was made in the field before living the site. After completion of the field work, the collected data was encoded and analyzed in Kathmandu. The household survey data was processed using computer software whereas the other data was processed manually. A Data Manager was responsible for developing data entry program, data cleaning/editing, managing the data entry process and processing the data in Kathmandu. The Data Manager has worked in close coordination with the experts.

3.16 Categorization of Impacts and Mitigation Measures

Matrix method has been used to assess impact of the project. The significance of both identified and predicted impacts were evaluated. Based on the evaluation each significant impact was further categorized as high, medium and low in terms of magnitude, short term, medium term and long term in terms of duration and local, site specific and regional in terms of extent. The magnitude, extent and duration were categorized as per National EIA Guideline 1993. Considering the impacts appropriate mitigation measures have been developed.

3.17 Criteria for Defining Project Affected and Vulnerable Households

The criterion for defining project affected households has been set based on followings:

- Marginally *Affected Households:* Households losing less than 10.0% of their total land.
- *S*everely *Affected Households:* Households losing more than 10% of their total land. This includes two sub-categories: i) Households losing more than 10% to 50% of their land and ii) Households losing more than 50% of their land. The households losing residential structures are also included in this category.
- Vulnerable *Households:* Women headed households, single women headed households, household heads with disabilities/old age, infected with chronic disease and HIV/AIDS, and Dalit households affected by the project are categorized under this category.

3.18 Definitions

The following definitions will be applied in the Resettlement Action Plan for the project:

- **Compensation:** The payment in cash or kind for private property acquired by the project at replacement value as defined by the Compensation Determination Committee (CDC) based on the RAP guidelines and framework.
- **Compensation Determination Committee (CDC):** The district-level committee established under Section 13 (2) of the Land Acquisition Act, 2034 (1977) to determine replacement value and compensation rates for property acquired under the Act.
- **Cut-off Date for Eligibility to Entitlement:** The cut-off date for eligibility to compensation and assistance will be the date of notification by the CDC/Bharatpur-Bardghat Project, NEA for land acquisition and compensation of affected households/assets.
- **Entitled Person:** Any person who is entitled for compensation due to loss of privately owned assets, and other rehabilitation assistance.
- **Project Affected Person:** Any person directly affected by the project through the acquisition of assets belonging to him/her of his/her household or community. This includes any person whose rights, standard of living, subsistence and income-generating capacity are adversely affected

through the acquisition of assets, whether full/partial, or permanent/temporary.

- **Project Affected Household:** Family members living together and sharing a single kitchen affected by acquisition of their assets, will be entitled for compensation, resettlement and rehabilitation measures.
- **Project Affected Group:** Communities or groups, that loses community resources due to the project.
- **Rehabilitation:** The measures taken to mitigate identified social impacts, including compensation, resettlement, rehabilitation and transition allowances where required.
- **Replacement Cost:** With regard to land and structures, "replacement cost" is defined as follows:
  - For agricultural land, it is the pre-project or pre-displacement, whichever is higher, market value of land of equal productive potential or use located in the vicinity of the affected land, plus the cost of preparing the land to levels similar to those of the affected land, plus the cost of any registration and transfer taxes.
  - For houses and other structures, it is the market cost of the materials to build a replacement structure with an area and quality similar to or better than those of the affected structures or to repair a partially affected structure, plus the cost of transporting building materials to the construction site, plus the cost of any labor and contractors' fees, plus the cost of any registration and transfer taxes.
- **Titleholder:** The person in whose name the project-affected land and/or building is registered and the person who is authorized by law to receive the compensation provided for the acquisition of land and/or building.
- **Tenant:** A person occupying/using land of a titleholder according to the stipulations of the Land Act, 2021 (1964).

3.19 Team Composition

The SIA is prepared by a team of professionals specialized in field of social science, resettlement and rehabilitation and community development with the help of field support team.

CHAPTER- -4: REVIEW OF RELEVANT POLICIES, ACTS, REGULATIONS, GUIDELINES AND CONVENTIONS

4.1 General

The current policies of GoN stress the importance of environmentally sound economic development and growth through economic liberalization. This chapter focuses on brief description of the policy, legal and administrative framework within which Bharatpur-Bardghat 220 kV Transmission Line Project will be implemented. The proponent will fulfill the legal requirement of Government of Nepal (GoN). as well as The World Bank Environmental and Social Safeguard Policies.

Some of these national and international policies, acts, rules, guidelines and conventions relevant to the proposed project regarding SIA are described below. The proponent will obey and follow if any other legal provisions besides those already mentioned in this chapter will be attracted due to various activities that will be undertaken as part of the project.

4.2 Constitution, National Plan/Policies, Acts, Rules and Guidelines

4.2.1 Constitution and Policy

4.2.1.1 Interim Constitution of Nepal, 2006

Article 13 (3): discrimination should not be made with regard to the color, origin, caste and language. Article 13 (4): equal wages shall be given to female for same kind of work. Article 19 (2): the state shall acquire legal private property only for public interest, and Article 19 (3): compensation shall be provided for such acquired property as prescribed by law. Article 35 (5) mentions about the environmental awareness to general public, minimization/avoidance of the impact of physical development works on environment and rare species with due emphasis of conservation. This article also deals with the biodiversity conservation, sustainable use of natural resources and equal distribution of benefits.

4.2.2 Acts

4.2.2.1 Land Acquisition Act, 1977

It is the main legislation to guide the land acquisition process in the country. Government can acquire land at any place in the country and up to any extent by giving compensation pursuant to the Act for such land required for any public purpose or, for the operation of any development project initiated by government institution (sections 3 and 4).

Section 3: GoN must be notified and requested about lands that need to be acquired.

Section 4: The project may acquire lands for the implementation of project works but the developer has to bear all expenses incurred in acquiring land.

Section 7: The Developer will have to pay fair compensation to the landowners.

The compensation paid under this Act will be given in cash. To decide about the amount of compensation, the Act has made provision for the constitution of Compensation Determination Committee (CDC). This Act is silent about the payment of compensation at market rate, which pose difficulty for the payment of compensation at present value.

4.2.2.2 Local Self-Governance Act, 1999

Local Self- Governance Act, 1999 empowers the local authorities and makes them more responsible towards local development. Article - 6 of VDC deals with the environment conservation and management while design the project/program. Article - 8 deals with penalty if anybody/person/institution is found polluting the environment. The Act empowers municipality to control and manage different type of pollution, forest resources and other natural resources. This Act is relevant for the social management in coordination with local VDCs during the project implementation.

4.2.2.3 Labor Act 1992

This act has been enforced by GoN in May 15. This act classifies people below 15 years as child and minor *"Nabalik"* for the age group of above 14 years and below 18 years. The act has also made provision of labor court and Department of Labor. The act clearly mentions that appointment letter should be issued for all the employees, which include their working hours, working time, wages and other benefits. The act allows for the time bond contract for the manpower required for development work. The act specifies that working hours for the *Nabalik* and women must be within the period of 6 AM to 6 PM that clearly restricts to deploy women in night works. The act also stated that equal opportunity shall be given to women as man. Similarly, working period of other employees must not exceed 8 hours a day and 48 hours in a week. According to this act wages rate of the employees shall not be less than rate fixed by the GoN.

This Act strictly prohibits the concerned parties who hire manpower to over utilize the manpower during its different activities. Section 27 of the Act has made the provision relating to health and safety. It is the duty of the management to maintain cleanness in the enterprises. Other provisions of this Act are outlined below:

- Section 4 states that prior work permit is required to Non-Nepali citizens and they are allowed to work in Nepal for certain period only in the area where Nepalese manpower is not available or not competent.
- Section 5 states that child labour i.e. under 14 years of age is prohibited.
- Section 18 states that thirty minutes must be allowed for rest and/or refreshments for every five hours of work.
- Section 18 states that over-time payment must be given at 1.5 times the normal wage if employees are required to work more than normal working hours i.e. 8 hours/day.

The act is relevant for project implementation especially the labor management in terms of working hour, wages and prohibition of child labor.

4.2.2.4 Land Reform Act, 2021 (1964)

The Land Reform Act, 1964 is considered as a revolutionary step towards changing the existing system of land tenure by establishing rights of tenants and providing ownership rights to actual Tiller. To date it has been amended five times. Article sets ceiling on land ownership according to geographical zones. Article 25 (1) of this act deals with tenancy rights that also exists.

4.2.2.5 Electricity Act, 1992

As per Article 33 of the Act the Government, if so desired, may acquire or use any land for the purpose of electricity transmission. The Act further has provision of restricting a certain area in and around a transmission line. Any loss resulting from such acquisition, use or restriction shall, however, be compensated as per the provision of prevailing rules.

4.2.3 Rules/ Regulations

4.2.3.1 Electricity Regulations, 1992

The Rules 12 and 13 state that the proponent willing to produce and transmit electricity should analyze environmental impacts of the proposed projects and include impact mitigation measures

and environmental measures including arrangements for the settlement of the displaced people. Rule 66 has provision for restricting a designated area around a transmission line in accordance with Article 33 of Electricity Act. Rule 87 has provision for compensating the affected people for any loss due to acquisition or restriction. Rule 88 defines the composition of the Compensation Fixation Committee for fixing such compensation.

4.2.3.2 Local Self Governance Regulation, 2000

Local Self-Governance Regulation empowers the local bodies to coordinate and implement development programs and for rationale utilization of local natural resources. Article -7 (69) empowers the VDCs for monitoring and supervision of development work implemented in the VDC. The Article - 4 of DDC has provision of three members (Agriculture, Forest, and Environment) committee to look after the concerned issues.

- Rule 211 of the regulation provides provision to share benefits of the revenue generated from the hydropower projects with the DDC.
- Schedule 26 mentions that GoN should provide 50 percent of the total revenue obtained from the sale of produced hydropower to the DDC. The DDC having the powerhouse will receive 12 percent of this revenue and the remaining 38 percent should be shared amongst the DDCs of that development region where the hydropower has been generated

4.2.4 Guidelines

4.2.4.1 National Environmental Impact Assessment Guidelines, 1993

According to the guidelines, IEE is mandatory for hydroelectric projects with generating capacities up to 5 MW. This guideline is frequently used and quite helpful right from making terms of reference to preparing impact assessment matrix and assigning values on impacts ranking. The other important feature of the guideline is description on community participation. Clause 49 deals with the methods to involve the public.

4.2.4.2 EIA Guideline for Agriculture Sector 2003

The EIA Guideline for Agriculture Sector 2003 was developed to minimize impacts on the agriculture sector due to increase in agricultural products and production and the activities of projects implemented by other organizations. Schedule 2 of the Guideline discusses the screening process for environmental studies, Schedule 4 relates to EIA scoping and Schedule 5 describes the requirements for the EIA TOR.

The construction of the transmission line will involve the acquisition of cultivated land for tower sites and may involve the leasing of cultivated land for temporary construction sites, thus standing crops may be affected and therefore the provisions of this Guideline are relevant to the project.

4.3 ILO Convention on Indigenous and Tribal Peoples, 1989 (No.169)

Convention No. 169 was adopted in 1989 by the General Conference of the International Labor Organization at its seventy-sixth session. It was ratified by the Legislative Parliament of Nepal in September 14, 2007. Convention No. 169 aimed at the protection of indigenous and tribal peoples and their rights. It is the foremost international legal instrument which deals specifically with the rights of indigenous and tribal peoples, and whose influence extends beyond the number of actual ratifications. The convention has 40 Articles. Some of them related to our study are given below:

Article -1 of the convention provide definition of the tribal and indigenous people.

ARTICLE 4.1: Special measures shall be adopted as appropriate for safeguarding the persons, institutions, property, labour, cultures and environment of the peoples concerned.

ARTICLE 6.1: In applying the provisions of this Convention, governments shall: a) Consult the peoples concerned, through appropriate procedures and in particular through their representative institutions, whenever consideration is being given to legislative or administrative measures which may affect them directly;

ARTICLE 6.2: The consultations carried out in application of this Convention shall be undertaken, in good faith and in a form appropriate to the circumstances, with the objective of achieving agreement or consent to the proposed measures.

ARTICLE 7.1: The peoples concerned shall have the right to decide their own priorities for the process of development as it affects their lives, beliefs, institutions and spiritual well-being and the lands they occupy or otherwise use, and to exercise control, to the extent possible, over their own economic, social and cultural development.

ARTICLE 7.3: Governments shall ensure that, whenever appropriate, studies are carried out, in cooperation with the peoples concerned, to assess the social, spiritual, cultural and environmental impact on them of planned development activities. The results of these studies shall be considered as fundamental criteria for the implementation of these activities.

ARTICLE 15: Rights of the peoples concerned to the natural resources pertaining to their lands shall be specifically safeguarded. These rights include the right of these people to participate in the use, management and conservation of these resources. The peoples concerned wherever possible shall

participate in the benefits of such activities and shall receive fair compensation for any damages that they may sustain as a result of such activities.

ARTICLE 16 (2) clearly mention that where the relocation of these peoples is considered necessary as an exceptional measures such relocation shall take place only with their free and inform consent. Where their consent cannot be obtained, such relocation shall take place only following appropriate procedures established by national laws and regulations, including public inquiries where appropriate, which provide the opportunity for effective representation of the peoples concerned.

ARTICLE 16 (3) mention that whenever possible these peoples shall have the right to return their traditional land as soon as the grounds for relocation cease to exist. Article 16(5) elaborated the persons thus relocated shall be fully compensated for any resulting loss or injury.

4.4 The World Bank Safeguard Policies

The World Bank has ten safeguard policies mainly environmental assessment, natural habitats, forest, pest management, safety of dams, involuntary resettlement, indigenous people, cultural property, projects involving international waters, projects in disputed area etc. The objectives of Safeguard policies are to integrate environmental and social issues in to decision making, to support Participatory approaches and transparency, to effective implementation of project for achieve sustainable development etc.

The objective of these policies is to prevent and mitigate undue harm to people and their environment in the development process. These policies provide guidelines for bank and borrower staffs in the identification, preparation, and implementation of programs and projects. Safeguard policies have often provided a platform for the participation of stakeholders in project design, and have been an important instrument for building ownership among local populations.

4.4.1 Involuntary Resettlement

Involuntary resettlement may cause severe long-term hardship, impoverishment, and environmental damage unless appropriate measures are carefully planned and carried out. The basic principle of Involuntary Resettlement Policy are; avoid, minimize and mitigate involuntary resettlement impacts, payment of compensation before taking possession of the property, compensation at replacement cost and carry out consultation from beginning to end of the project. For these reasons, the overall objectives of the Bank's policy on involuntary resettlement are the following:

(a) Involuntary resettlement should be avoided where feasible, or minimized, exploring all viable alternative project designs.

(b) Where it is not feasible to avoid involuntary resettlement, resettlement activities should be conceived and executed as sustainable development programs, providing sufficient investment resources to enable the persons displaced by the project to share in project benefits.

(c) Displaced persons should be meaningfully consulted and should have opportunities to participate in planning and implementing resettlement programs.

(d) Displaced persons should be assisted in their efforts to improve their livelihoods and standards of living or at least to restore them, in real terms, to pre-displacement levels or to levels prevailing prior to the beginning of project implementation, whichever is higher.

To address the impacts covered of this policy, the borrower must prepare a resettlement plan or a resettlement policy framework. The framework shall include consultation process, alternatives, compensation at full replacement cost for losses of asset, assistance (such as moving allowances) during relocation, residential housing, or housing sites, or, as required, agricultural sites, offered support after displacement for a transition period to restore their livelihood and standards of living and provide with development assistance such as land preparation, credit facilities, training, or job opportunities in addition to compensation measures.

4.4.2 Indigenous People

The World Bank defines indigenous people, as the people, who have their self-identification, collective attachment to ancestral lands, customary culture, economic, social, political institution and indigenous language. The World Bank recognizes that the identities and cultures of indigenous peoples are inextricably linked to the lands on which they live and the natural resources on which they depend. These distinct circumstances expose indigenous people to different types of risks and levels of impacts from development projects, including loss of identity, culture, and customary livelihoods, as well as exposure to disease.

As social groups with identities that are often distinct from dominant groups in their national societies, indigenous peoples are frequently among the most marginalized and vulnerable segments of the population. As a result, their economic, social, and legal status often limits their capacity to defend their interests in and rights to lands, territories, and other productive resources, and/or restricts their ability to participate in and benefit from development. At the same time, The World Bank recognizes that indigenous people play a vital role in planning and implementation of development projects and their continued consultation, participation and cooperation are of profound significance in all projects.

CHAPTER-5: COMMUNITY CONSULTATION AND GRIEVANCE REDRESS MECHANISM

5.1 General

The public, as the citizens of a republic country and key stakeholders in development have the right to know and to be involved in information exchange and decision-making that affects their lives, resources and properties from the beginning of a project. Community participation and consultation from the beginning is crucial to reduce misunderstandings and successful implementation of a project and it is also a legal provision. When the public is well informed and motivated, project implementation could be relatively trouble-free. Considering this, the project has given emphasis to community participation and consultation throughout the preparation of this SIA.

5.2 Procedure for Consultation and Participation

PRA and FGD were used as main tool for community consultation and participation for the preparation of RAP. During the consultation the participants were requested to express their concerns/issued regarding the project as well as they were informed regarding the project and its activities. Information such as project purpose, project type, impact area, likely impacts and potential opportunities due to project implementation were provided to the people during the consultation. In addition 5 KIS and 10 market survey on agricultural commodities was also conducted to collect baseline data of the project area. During the household survey the affected households were informed about the ongoing project activities, likely impacts and possible mitigation measures.

Table -5.1: Stakeholder Consultation in Project Area

S.No.	VDCs/Municipality	Market Survey	PRA	FGD	KIS
1	Amarapuri	1	1		
2	Devchuli	1	1	1	1
3	Dhaubadi	0	0		
4	Dibyapuri	1	1		
5	Dumkibas	1	1	1	1
6	Gaindakot	1	1		
7	Makar	1	1	1	1
8	Mukundapur	1	2	2	1
9	Naya Belhani	0	1	1	1
10	Rajahar	1	1		
11	Shiva Mandir	1	2	1	
12	Tamsariya	1	1		

	Total	**10**	**13**	**7**	**5**

Altogether 13 Participatory Rural Appraisals (PRA) were conducted in 11 VDCs affected by the project to collect basic socio economic information, views, concerns and expectation of the local people from the project. Similarly, the participants were also informed regarding the project and its activities during the PRA. Altogether 158 participants representing different caste/ethnic groups, member's of the project affected households, former VDC Chairman, VDC Secretary, school teacher, businessmen, farmer, student, social workers and representatives of women organizations, NGOs, CBOs, political parties etc. were participated in the PRA meetings. The average number of participants in each PRA was 12.15 persons.

Of the participants, the representation ratio of male and female is 62.03% and 37.97% respectively. Furthermore, Hill-Brahmin/Chhetri, Tamang, Dalits, Gurung, Tharu and Magar are the dominant caste/ethnic groups were participated during the meetings. The detail of PRA conducted during the field survey is presented below.

Table-5.2: Location of PRA, number of participants and dominants caste/ethnic groups

Location of public meeting				**No. of Participant**			**Major caste/ethnic groups**
AP section	District	VDC/wards	Village/Tole	Total	Male	Female	
J-21	Nawalparasi	Gaidakot VDC-1	British Camp	14	10	4	Magar, Gurung, Brahmin/ Chhetri
Z- 441 to Z442/ Z-446 to Z-447	Nawalparasi	Mukundapur-2/5	Malpur/Bhaisehkori	26	15	11	Brahmin/ Chhetri
Z-495 to Z-496	Nawalparasi	Amrapuri VDC-3	Mejhi Tole	9	7	2	Brahmin/ Chhetri
Z-498 to Z-499	Nawalparasi	Rajahar VDC-8	Satghare	11	7	4	Brahmin/Chhetri , Tamang,/Gurung and Dalits
Z-522	Nawalparasi	Dibyapuri VDC-9	Mirtung	12	6	6	Gurung, Magar, Brahmin/ Chhetri
Z-527 to Z-528	Nawalparasi	Devchuli VDC-7	Mudabas	14	10	4	Gurung/Magar
Z549 to J-31-1	Nawalparasi	Shiva Mandir VDC-8/9	Koilapani/Haraura	19	12	7	Magar, Brahmin/Chhetri
J-35	Nawalparasi	Tamsariya-5	Tareni	13	4	9	Brahmin/Chhetri, Tharu
J-39 to Z-584	Nawalparasi	Naya Belhani VDC-8	Tandi	13	7	6	Dalits
Z-621 to Z-622	Nawalparasi	Dumkibass VDC-2	Suntandi	15	12	3	Gurung Magar, Brahmin
Z-651 to Z-652	Nawalparasi	Makar VDC-9	Bandakhola	12	8	4	Tharu
				158	**98**	**60**	

	100	**62.03**	**37.97**	

Table-5.3: Location of FGD, number of participants and dominants caste/ethnic groups

VDC	**Location**	**Number of Participants**			**Major Caste/Ethnic Group**
		Total	Male	Female	
Mukundpur	Bhedabari-3	10	6	4	Damai, Brahmin
Mukundpur	Bhaisakhori-5	10	2	8	Dalit (BK, Pariyar)
Shiva Mandir	Hasaura	40	30	10	Gurung and others
Devchuli	Mudabas	11	9	2	Magar
Nayabelhani	Tandi	11	8	3	Dalit (BK, Pariyar)
Dumkibas	Suntandi	30	22	8	Gurung /Magar
Makar	Banda Khola	12	9	3	Tharu
	Total	**124**	**86**	**38**	

Household survey indicates that about 60% of surveyed households have positive attitude towards the implementation of the project while 13.33% is against the project's implementation and 13.33% have shown neutrality. According to local people the reason behind the support of the project is the need of transmission line for regular supply of electricity thus solving the problem of electricity crisis in the country. Regarding reason for negative attitude is low compensation, likely relocation from the area/site and difficulty to manage in new society.

Besides this informal meetings with key stakeholders of the project area, visit by the experts and interaction with local people were also the part of public consultation. The concerns/issues of local people/institutions have been incorporated in relevant section of the RAP.

5.3 Key Issues/Concerns Raised During Community Consultation

The local people have positive attitude regarding implementation of the project realizing the need of transmission line for regular supply of electricity and solving load shedding problem. During the community consultation, several issues and concerns were raised by the people. The key issues and concerns raised by the local people are related to compensation, employment, re-routing of the transmission line, implementation of mitigation and enhancement measures and community

participation in the project activities. The key issues/concern raised by the local people during community consultations is summarized in Table-5.3 and details are presented in Appendix III.

Table 5.4: Summery of Key Issues and Concerns

Key Areas of Concerns	Details of Issues/Concerns
Compensation	• Appropriate compensation for land and private property should be provided, • Compensation for the impacts due to transmission line should be determined considering the unique nature of the loss resulted. In contrary to other public infrastructures, transmission line will greatly devaluate the value of the land on the RoW since the strip of the land (RoW) affects the value of the whole land plot. • The land compensation should be agreed with the affected households and project should be developed with minimum or no impacts to the community. • Compensation of land/property as per the prevailing market rate (Not for Government valuation), • Compensation of ***Ailani*** land should be provided as per registered land, • Local people living in the non registered land may create the problem for the distribution of compensation (Land and structures).
Livelihood	• Employment opportunities should be provided to the local people during the project construction, • Devaluation of RoW land (The private land under RoW would neither be accepted by the banks as collateral nor be sold).Hence, the transmission line should be avoided from the potential residential plots. • Most of private structures particularly in Bhaisekhori (Mukundapur VDC), Mejhi (Amarapuri VDC), Mudabas, Rambas (Devchuli VDC), Suntandi (Dumkibas VDC), and Hasura (Shiva Mandir VDC) fall in the RoW. The implementation of the proposed transmission line project will displace these households. Therefore, the local people requested to develop special resettlement package otherwise T/L should be shifted to the forest site. The resettlement and livelihood restoration program should be guaranteed.
Transmission Line Alignment	• The present transmission line route is accepted by local people in most of the area, • The people of Harsaura settlement of Shivamandir VDC (J-31-1 to J-31) and Suntandi of Dumkibas VDC (Z-621 to Z-622) are opposing the route and they do not agree to allow construction work on the current route. They requested to shift the alignment at least 500m away from the settlement. After continuous effort of the study team people participated in meeting but they had single agenda, the re-routing of the alignment. They have submitted request letter to NEA management (2068/8/20) and Ministry of Energy regarding re –routing.
Community Support Programs	• Support for health, education/school, irrigation, road/bridge and drinking water in the project affected area, • Community support programs like skill development (Health and Education), technical trainings, and women empowerment program, income generation program, Agricultural and livestock assistance program should be launched by the project.
Service facility	• Electricity service should be regular and reliable,
Infrastructure	• Public and private infrastructures should be protected during the construction of the project. • Protection of religious and cultural sites. • Football ground, resting Chautari and Senchen Chhyoling Gumba located at Shiva Mandir VDC ward no 8 (Z-541to Z-542) and Basundhara Devi Mandir located at Mukundapur VDC ward no 5 (Z-441 to Z-442) of

	Nawalparasi district fall in RoW. The local people requested to protect the religious sites and the play ground from the high voltage transmission line. Similarly, a resting place and public tap located at Amarapuri VDC ward no 3 (Z-495 to Z-496) and two private temples located at Dhaubadi VDC ward no 7 falls in the Row. Local people requested to shift the alignment if possible or construct these infrastructures with better facilities
Skill Development Training	• Driving, house wiring, plumbing, agriculture and livestock training, computer training, repair and maintenance of electrical equipment and tailoring are the areas of skill development training requested by the participants
Consultation	• The participants requested that continuous consultation between the project and local people should be made at different stages of project development.
Other	• Information about adverse impact of high voltage transmission line should be provided for the local people prior to the construction of the project, • Resettlement is required for all the displaced people being otherwise they will be homeless and landless, • The ILO 169 and public safeguard policies should be strictly followed by the project.

5.4 Continuation of Consultation Process

The major issues raised during consultation process will be addressed through different mechanism and support system. Major areas of public concerns pertain to ample amount of compensation for the lost assets, supports for their livelihood, selecting best transmission line alignment to avoid and minimize losses and enhanced participation of the people at different forums and levels of project implementation. In addition, the public have demanded several community support programs as a measure to improve their livelihood and it seems important for the project and public to sit together and come up with consensus regarding the areas of supports that they might be provided. Continued consultations with the public, therefore, seem to be the most strategic approach for the project to discuss and decide areas of supports at different stages of project cycle i.e. design, implementation and post implementation.

5.5 Grievance Redress Mechanism

Grievance redress mechanism will be established to allow project affected persons/households (PAPs/HHs) to appeal any disagreeable decisions, practices and activities arising from compensation for land and assets. The PAPs/HHs will be made fully aware of their rights and the procedures.

There is the potentiality for two types of grievances: grievances related to land acquisition and resettlement requirements, and grievances related to compensation or entitlement. The PAPs/HHs will have access to both locally constructed grievances redress committee, i.e., local consultative forum, and Ministry of Home Affairs. With regard to the compensation made for the land acquired for tower pads, every PAP/Hhs can appeal to the Ministry of Home Affair if they feel that they are not compensated appropriately. They may appeal to the Ministry of Home Affair within 35 days of the public notice given to them.

Special project grievance mechanisms such as on site provision of complain hearings allows project affected persons/HHs and communities to interface and get fair treatment on time. The project authority will ensure that funds are delivered on time to CDC and the implementing partners for timely preparation and implementation of social activities, as applicable. The compensation issues and rehabilitation measures for the private land affected for tower pads will be completed before civil work starts.

The Land Acquisition and Rehabilitation Unit (LARU) will establish a compliant desk to be manned by administrative officer assisted by support staff. All complaints/concerns shall be received at this desk and resolved immediately by chief of LARU, if minor ones involving procedural/policies and guidelines only. Likewise, the Project Manager Office (PMO) shall refer to the concerned office/group for all other issues, which cannot be resolved at the complain desk.

The following procedure will be observed in the settlement of conflicts/concerns:

- PAF, local people or community can lodge their complain to LARU. The section chief through its staff verifies the issues and give their decision within 7 days of compliant register in the office. If the issue is settled the process ends.
- If the party is not satisfied with the decision of LARU, the issues will be forwarded to PMO. The PMO verify the issues and discus with the representative of the complaining community/individual and Environment and Social Monitoring Unit to resolve the issue. The PMO will provide their decision within 10 days of complain received in his/her office. The PMO may consult legal advisor or NEA, Central Office if required. If the issue is settled the process ends.
- If the issue is not solved to the satisfaction, the concern will be forwarded to LCF from PMO. The LCF will visit the site, verify the issues and call meeting to solve the problem. The LCF will provide its decision on the concerned issues within 15 days of complain received. If the issue is related to compensation rates the PMO will discuss the concerns with CDC along with recommendation of LCF. The CDC will review the grievances and provide decision within 7 days. If the issue is settled the process ends.
- If the concern remains unresolved, and community/individual is still not satisfied, this is elevated to the Ministry of Home Affairs in case of Compensation. The PMO shall resolve the issues in coordination with the Ministry of Energy

CHAPTER-6: BASELINE SOCIO-ECONOMIC CONDITION

This section presents the socio-economic profile of the project districts, project area and project affected households.

6.1 Socio-economic Information of the Project Districts

The Bharatpur- Bardghat 220 kV Transmission Line Project is located in two districts namely Chitwan and Nawalparasi districts of Nepal. These districts, in total, include 109 VDCs and 3 municipalities. Of these, 36 VDCs and 2 municipalities are in Chitwan district and, 73 VDCs and 1 municipality are in Nawalparasi district. According to CBS, 2002 the total population of the two districts is 10, 34,918 with 5,13,341 male and 5,21,577 female. The population distribution between male and female is 49.60 percent and 50.40 percent respectively. The average population density of two districts is 236.5 persons /sq. km. Similarly, there are 1, 91,203 households with an average household size 5.25.

Table- 6.1: Demographic Characteristics the Project districts

Descriptions	Chitwan	Nawalparasi	Total/Average
Total Population	472048	562870	1034918
Male	235084	278257	513341
Female	236964	284613	521577
Total Numbers of Households	92863	98340	191203
Average Households Size	5.08	5.42	5.25
Population Density(Persons/ Sq. km)	213	260	236.5
Sex Ratio(M/F)	99.21	98	98.6
Total no of Municipalities	2	1	3
Total no of VDCs	36	73	109

Source: CBS 2002

According to available data, the total area of the project districts is 4, 23,414 ha. Out of which 60.77% covered by forest, 27.64% cultivated land, 5.47% grazing land and 6.11% other land uses (Table 6.2). The other category of land includes river, river bed and government land, etc.

Table -6.2: Land Use Patterns of the Project Districts

Districts	Total Area (ha)	Forest(ha)	Cultivated Land(ha)	Grazing(ha)	Others(ha)
Chitwan	221800	142422	46894	18882	13602
Nawalparasi	201614	114900	70143	4296	12275
Total	**423414**	**257322**	**117037**	**23178**	**25877**
Percentage	**100**	**60.77**	**27.64**	**5.47**	**6.11**

6.2 Socio-economic Information of the Project Affected VDCs/Municipality

The proposed alignment traverses through 14 VDCs and one municipality of two districts (Table 6.3).

Table-6.3: List of project affected districts and VDCs

S.N.	District	VDC/Municipality
1	Chitwan	Bharatpur Municipality
2	Nawalparasi	VDCs: Amarapuri, Devchuli, Dhaubadi, Dibyapuri, Dumkibas, Gaindakot, Makar, Mukundapur, Nayabolan, Rajahar, Shiva Mandir, Tamsariya, Parsauni and Deurali VDCs

6.2.1 Demography

According to the National Population Census 2001, the total population of the project VDCs/Municipality is 247139 with 122263 male (48.41 %) and 124876 (51.59%) female. This implies that the population of the project affected VDCs/Municipalities represent 18.92% and 28.04% population of the Chitwan and Nawalparasi districts respectively. The total number of households is 49808 with average household size 4.96 which is lower than the average household size of the project districts (5.25).

Table- 6.4: Population distribution of the project area

S.No.	VDCs/Municipality	Population			Total HHs	Ave. HH. Size
		Total Pop.	Male	Female		
A.	**Chitwan District**					
	Bharatpur Municipality	89323	45858	43465	19922	4.48
B	**Nawalparasi District**					
1	Gaindakot	21775	11006	10769	4423	4.92
2	Mukundpur	10092	4939	5153	2016	5.01
3	Rajahar	10137	4946	5191	1842	5.5
4	Dibyapuri	7387	3667	3720	1439	5.13
5	Devachuli	7006	3296	3710	1119	6.26
6	Dhaubadi	5561	2638	2923	841	6.61
7	Shivmandir	17476	8357	9119	3417	5.11
8	Deurali VDC	13353	6369	6984	2167	6.16
9	Tamsuria	10003	4655	5348	1930	5.18
10	Prasauni	6094	3003	3091	1172	5.2
11	Nayabelhani	11594	5539	6055	2348	4.94
12	Dumkibas	9519	4525	4994	1759	5.41
13	Makar	20594	10082	10512	4003	5.14
14	Amrapuri	7225	3383	3842	1410	5.12
	Sub-total	**157816**	**76405**	**81411**	**29886**	**5.28**
		247139	**122263**	**124876**	**49808**	**4.96**
Percentage			**48.41**	**51.59**		

Source: CBS 2002

6.2.2 Population Distribution by Age Groups

Out of them 50096 are male and 50096 are female. The population below 15 years of age is 89,950, which is 36.40% of the total population. On the basis of ILO criteria (age between 15 and less than 60 years), the economically active population in the project affected VDCs/Municipalities is 58.08% of the total population (Table 6.5).

Table-6.5: Population Distribution of Project Area by Age

S. NO	VDCs	Population					
		Below 10 Year	10 to 14 years	15 to 34 Years	35 to 60 Years	Above 60 Years	Total
A.	**Chitwan District**						
	Bharatpur Municipality	17820	11023	36217	18690	5573	89323
B	**Nawalparasi District**						
1	Gaindakot	5063	2895	8219	4228	1370	21775
2	Mukundpur	2298	1346	3552	2142	754	10092
3	Rajahar	2435	1414	3547	2067	674	10137
4	Dibyapuri	1812	973	2658	1482	462	7387
5	Devachuli	1965	1028	2191	1369	453	7006
6	Dhaubadi	1687	853	1598	1095	328	5561
7	Shivmandir	4386	2510	5755	3693	1132	17476
8	Deurali	3593	1919	4360	2646	835	13353
9	Tamsuria	2482	1424	3311	2145	641	10003
10	Prasauni	1587	836	2047	1247	377	6094
11	Nayabelhani	2745	1646	3971	2511	721	11594
12	Dumkibas	2359	1387	3150	2013	610	9519
13	Makar	4936	2769	7229	4316	1344	20594
14	Amrapuri	1739	1020	2423	1546	497	**7225**
	Sub-total	**39087**	**22020**	**54011**	**32500**	**10198**	**157816**
	Total	**56907**	**33043**	**90228**	**51190**	**15771**	**247139**
	Percent	**23.03**	**13.37**	**36.51**	**20.71**	**6.38**	**100.00**

Source: CBS 2002

6.2.3 Population Composition by Caste/Ethnicity

The project affected area is a heterogeneous composition of people of different origins, cultures, languages and ethnicities. The project area is dominated by Hill-Brahmin (33.56%) followed by Magar (16.23%) and Chettri (9.29%). Similarly, caste/ethnic population, like Newar (5.94%), occupational caste (6.72%) and Tharu (5.97%).

Table-6.6: Population Distribution by Caste/Ethnicity

S.No.	VDCs/ Municipalities	Ethnicity									
		Brahmin	Chhetri	Newar	Magar	Gurung	Tharu	Others	Occupational Cast	Other (not stated)	Total
A.	**Chitwan District**										
	Bharatpur Municipality	35953	10843	10062	3712	5409	1616	7471	6803	7454	**89323**
B	**Nawalparasi District**										
1	Gaindakot	10215	1802	964	2420	1084	272	662	1502	2854	21775
2	Mukundpur	3861	1166	512	733	301	0	172	1200	2147	10092
3	Rajahar	3093	1065	220	1625	259	1746	624	620	885	10137
4	Dibyapuri	2444	539	104	1859	165	772	314	210	980	7387
5	Devachuli	1118	308	170	4087	245	70	161	280	567	7006
6	Dhaubadi	636	138	32	3888	20	111	79	208	449	5561
7	Shivmandir	5881	1361	698	3949	1045	819	1038	1090	1595	17476
8	Deurali	1403	479	185	7527	356	625	532	1180	1066	13353
9	Tamsuria	3034	682	160	1261	172	2028	1423	330	913	10003
10	Prasauni	1364	297	28	175	27	2430	460	250	1063	6094
11	Nayabelhani	2252	696	464	1920	847	417	2580	570	1848	11594
12	Dumkibas	2064	690	256	3543	666	94	740	455	1011	9519
13	Makar	5604	2041	685	2869	1112	3692	405	1200	2986	20594
14	Amrapuri	4030	853	145	532	292	67	181	705	420	7225
	Sub-total	**46999**	**12117**	**4623**	**36388**	**6591**	**13143**	**9371**	**9800**	**18784**	**157816**
	Total	**82952**	**22960**	**14685**	**40100**	**12000**	**14759**	**16842**	**16603**	**26238**	**247139**
	Percent	**33.56**	**9.29**	**5.94**	**16.23**	**4.86**	**5.97**	**6.81**	**6.72**	**10.62**	**100.00**

CBS 2002

Others- Tamang, Praja,Kumal and Muslim

6.2.4 Population Composition by Religion

Majority of the population in the project affected area belongs to Hinduism (86.44%) followed by Buddhism (11.73%). Islam (0.68%), Kirant (0.05%) and Christianity (0.96%) are the other religions practiced by the people in the project area (Table 6.7).

Table -6.7 :Population Distribution by Religion for VDC/Municipality by District

S.No.	VDCs	Religion							
		Hindu	Buddhist	Islam	Kirat	Christian	Sikh	Not Stated	Total
A.	**Chitwan District**								
	Bharatpur Municipality	77280	10098	1071	119	575	32	148	89323
B	**Nawalparasi District**								
1	Gaindakot	20262	1364	62	2	68	0	17	21775
2	Mukundpur	9167	847	28	0	49	0	1	10092
3	Rajahar	8917	748	69	0	386	0	17	10137

4	Dibyapuri	6629	450	70	0	223	0	15	7387
5	Devachuli	5266	1524	0	0	214	0	2	7006
6	Dhaubadi	4962	500	2	0	91	0	6	5561
7	Shivmandir	13440	3642	98	0	271	0	25	17476
8	Deurali	10564	2716	7	0	58	5	3	13353
9	Tamsuria	9451	476	6	0	60	0	10	10003
10	Prasauni	5936	99	21	0	37	0	1	6094
11	Nayabelhani	10050	1456	59	1	14	0	14	11594
12	Dumkibas	6069	3260	22	0	126	0	42	9519
13	Makar	19101	1229	157	9	95	0	3	20594
14	Amrapuri	6527	592	9	0	95	0	2	7225
	Sub-total	**136341**	**18903**	**610**	**12**	**1787**	**5**	**158**	**157816**
	Total	**213621**	**29001**	**1681**	**131**	**2362**	**37**	**306**	**247139**
	Percent	**86.44**	**11.73**	**0.68**	**0.053**	**0.96**	**0.01**	**0.12**	**100.00**

Source: CBS 2002

6.2.5 Festivals, Cultural and Religious Practices

The major festivals of the project area are Vijaya Dashami, Tihar, Maghe Sankranti, Holi, Ram Nawami –and Teej for Hindu people. Lhosar is the major festival of the Gurung communities. Likewise, Id and *Ramjan* are the major festivals of Muslim communities. Tharu community mostly celebrates Maghi Mela.

Popular cultural activities in the area are Teej mela (fair), Bhailo and Deushi (singing and dancing activities) in Tihar, Holi (colour festival), Bhajan–Kirtan in Ram Nawami and Kirshnajanmastami (praying by singing), cultural programs in Shripanchami and Dhami and Jhankri Naach (dance performed during various religious activities and festivals). Other religious activities in the project area are Pasni (rice feeding ceremony for newly born babies), Bratabanda (thread wearing ceremony of teenage boys), marriage and Sharaadha (worship for the soul of the dead people) etc.

6.3 Socio-economic Information of the Project Affected Families (PAFs)

The families whose land or property or both are acquired by the project permanently are defined here as the project affected family (PAFs). This section describes the socioeconomic status of project affected households based on the findings of survey of 105 households from 12 VDCs of Nawalparasi district.

6.3.1Demographic Information

6.3.1.1 Population and Households

The total population of 105 surveyed households is 683 with male 354 (51.83%) and female 329 (48.17%). The male population of PAFs is comparatively higher than the female population. Similarly, the average male and female sex ratio of PAFs is 1.08.

Table - 6.8: Population and households of PAFs

VDCs	Population				Households	
	Male	Female	Total	Sex Ratio	Total	Average HH Size
Amarapuri	66	56	122	1.18	17	7.2
Devchuli	26	25	51	1.04	7	7.3
Dhaubadi	12	13	25	0.92	2	12.5
Dibyapuri	11	6	17	1.83	3	5.7
Dumkibas	49	46	95	1.07	16	5.9
Gaindakot	5	9	14	0.56	3	4.7
Makar	29	31	60	0.94	10	6.0
Mukundapur	67	64	131	1.05	17	7.7
Nayabolan	18	10	28	1.80	6	4.7
Rajahar	11	9	20	1.22	4	5.0
Shiva Mandir	56	51	107	1.10	18	5.9
Tamsariya	4	9	13	0.44	2	6.5
Total/Ave.	**354**	**329**	**683**	**1.08**	**105**	**6.5**

Source: Household Survey, 2011

Family Structure

Nuclear family system is commonly practiced in PAFs. The field study shows that among the surveyed households 60% are nuclear families and 42% are joint families (Table 6.9).

Table- 6.9: Families Structure of the PAFs

VDCs	Family Type		
	Nuclear	Joint	Total Households
Amarapuri	8	9	17
Devchuli	4	3	7
Dhaubadi		2	2
Dibyapuri	2	1	3
Dumkibas	10	6	16
Gaindakot	3		3
Makar	5	5	10
Mukundapur	10	7	17
Nayabolan	5	1	6
Rajahar	3	1	4
Shiva Mandir	12	6	18
Tamsariya	1	1	2
Total	**63**	**42**	**105**
Percent	**60.00**	**40.00**	**100**

Source: Household Survey, 2011

Distribution of Population by Age Groups

The surveyed population comprises 21.4% children (0-14 years), 69.7% people in the economically active category (15-59 years) and 8.9% aged people (above 60 years).The overall dependency ratio is 30.3% with child dependency ratio 21.4% and aged dependency 8.9% (Table 6.10).

Table 6.10: Population Distributions of PAFs by Age Group

VDCs	Broad Age Groups			Total Population
	0-14 Years	15-59 Years	60 Years and Above	
Amarapuri	20	90	12	122
Devchuli	11	36	4	51
Dhaubadi	8	15	2	25
Dibyapuri	5	12	0	17
Dumkibas	15	70	10	95
Gaindakot	3	11	0	14
Makar	15	42	3	60
Mukundapur	25	91	15	131
Nayabolan	7	20	1	28
Rajahar	6	12	2	20
Shiva Mandir	28	68	11	107
Tamsariya	3	9	1	13
Total/Ave.	**146**	**476**	**61**	**683**
Percent	**21.4**	**69.7**	**8.9**	**100**

Source: Household Survey, 2011

6.3.1.2 Marital Status of PAFs

Regarding marital status of the surveyed population, 53.9 % is married, 43.5% is unmarried and 2.6% is widow or widower. The married population of the PAFs is higher as compared with the unmarried population (Table 6.11).

Table -6.11: Marital Status of PAFs

VDCs	Marital Status			Total Population
	Unmarried	Married	Widow/ Widower	
Amarapuri	47	72	3	122
Devchuli	27	23	1	51
Dhaubadi	13	12		25
Dibyapuri	7	10		17
Dumkibas	37	57	1	95
Gaindakot	7	6	1	14
Makar	28	31	1	60
Mukundapur	53	72	6	131
Nayabolan	15	12	1	28
Rajahar	10	10		20
Shiva Mandir	46	59	2	107
Tamsariya	7	4	2	13
Total	**297**	**368**	**18**	**683**
Percent	**43.5**	**53.9**	**2.6**	**100**

Source: Household Survey, 2011

6.3.1.3 Education and Literacy

Of the surveyed population aged six years and above, nearly 12.44% is illiterate. The gender gap in literacy is wide. The illiteracy among women is 19.03% whereas the illiteracy among men 6.31% (Table 6.12). The average literacy rate of the project affected families is higher (87.9%).

Table- 6.12: Literacy Status of the PAFs

Literacy Status	Male		Female		Total	
	No.	%	No.	%	No.	%
Illiterate	21	6.31	59	19.03	80	12.44
Literate	312	93.69	251	80.97	563	87.56
Total	333	100.00	310	100.00	643	100.00

Source: Household Survey, 2011

Educational Attainment

Educational attainment among the 563 people recorded as literate is not satisfactory, with about 21.49% having no formal education and a further 20.78% achieving a primary level education only. Of the literate population, 7.99% had passed the School Leaving Certificate (SLC) and nearly 8.35% the intermediate level; and 7.46% had a bachelor's or higher degree (Table 6.13). The educational status of the project affected population is satisfactorily as compared with the educational status of the project affected VDCs/Municipalities.

Table -6.13: Educational Attainments among the Literate Population of the PAFs

Educational Attainment	Male		Female		Total	
	No.	%	No.	%	No.	%
Literate only	61	19.55	60	23.90	121	21.49
Primary level	62	19.87	55	21.91	117	20.78
Lower secondary	59	18.91	40	15.94	99	17.58
Secondary	43	13.78	49	19.52	92	16.34
SLC	30	9.62	15	5.98	45	7.99
Intermediate	29	9.29	18	7.17	47	8.35
Bachelor's and above	28	8.97	14	5.58	42	7.46
Total (Literate)	**312**	**100.00**	**251**	**100.00**	**563**	**100.00**

Source: Household Survey, 2011

6.3.1.4 Caste/Ethnicity

The project area is diverse in caste/ethnicity. Of the surveyed households, about 2.86% households are Tamang (Marginalized Groups), 47.02% Brahamin/Chettri and 22.86% Disadvantaged Groups (Gurung and Magar). About 40% of surveyed households fall under the category of indigenous and tribal people listed by the Government of Nepal. The listed indigenous and Tribal people found among the PAFs are Tharu, Gurung, Magar, Kumal and Tamang etc (Table 6.14).

Table- 6. 14: Caste/Ethnic Composition of the Surveyed Households

Caste/Ethnic Group	No. of HHs	Percent
Indigenous:		
• Tamang *(Rajahar-2 HHs, Nayabolan - 1 HH)*	3	2.86
• Tharu *(Dumkibas-1 HH, Makar-5 HHs, Mukundapur-5 HHs, Shiva Mandir-3 HHs)*	14	13.33

• Gurung and Magar (Gaindakot-*3 HHs, Dumkibas-8 HHs, Devchuli-6 HHs, Shiva Mandir -4 HHs, Rajahar, Dibyapuri and Amarapuri-3 HHs)*	24	22.86
• Kumal (*Nayabolan -1 HH)*	1	0.95
Total Indigenous HHs:	**42**	40.0
Brahmin	43	40.95
Chhetri	7	6.67
Thakuri	1	0.95
Dalit *(Damai – 5 HHs, Musahar – 2 HHs, Biswokarma - 3 HHs and Sunuwar – 2 HHs)*	12	11.43
Total HHs:	**105**	**100.00**

Source: http://nefin.org.np/indigenous-nationalities/categorization.html for Indigenous Category
Household Survey, 2011

6.3.1.5Religion

According to household survey, Hinduism (94.28%) is the dominant religion among the surveyed households followed by Buddhism (5.72%). The religion status of different VDCs is given in Table 6.15.

Table -6.15: Distribution of Surveyed Households by Religion

VDCs	Religion		Total Households
	Hinduism	Buddhism	
	No.	No.	
Amarapuri	17		17
Devchuli	7		7
Dhaubadi	2		2
Dibyapuri	3		3
Dumkibas	11	5	16
Gaindakot	3		3
Makar	10		10
Mukundapur	17		17
Nayabolan	6		6
Rajahar	3	1	4
Shiva Mandir	18		18
Tamsariya	2		2
Total	99	6	105
Percentage (%)	94.28	5.72	100

Source: Household Survey, 2011

6.3.1.6 Language

Nepali (65.7%), Magar (15.2%), Tharu (12.4%) and Gurung (6.7 %) are the major language spoken by PAFs. Among these languages, Nepali is widely spoken for communication among the PAFs (Table 6.16).

Table -6.16: Distribution of Surveyed Households by Spoken Language

VDCs	Language								Total Households
	Nepali		Magar		Tharu		Gurung		
	No.	%	No.	%	No.	%	No.	%	
Amarapuri	16	94.1					1	5.9	17
Devchuli	1	14.3	6	85.7					7
Dhaubadi	2	100.0							2
Dibyapuri	2	66.7	1	33.3					3
Dumkibas	8	50.0	2	12.5	1	6.3	5	31.3	16
Gaindakot	2	66.7					1	33.3	3
Makar	5	50.0			5	50.0			10
Mukundapur	13	72.2			5	27.8			18
Nayabolan	5	83.3	1	16.7					6
Rajahar	2	50.0	2	50.0					4
Shiva Mandir	11	64.7	4	23.5	2	11.8			17
Tamsariya	2	100.0							2
Total	**69**	**65.7**	**16**	**15.2**	**13**	**12.4**	**7**	**6.7**	**105**

Source: Household Survey, 2011

6.3.1.7 Migration

The project area is dominated by migrants and 79.05 % households are migrant population. The migrant population is high in Amarapuri, Dumkibas, Shiva Mandir and Mukundapur VDCs (Table 6.17).

Table -6.17: Migration Status of Households

VDCs	Migration Status of Households		
	Native	Migrant	Total
Amarapuri	1	16	17
Devchuli	5	2	7
Dhaubadi	1	1	2
Dibyapuri		3	3
Dumkibas		16	16
Gaindakot	1	2	3
Makar	5	5	10
Mukundapur	7	10	17
Nayabolan		6	6
Rajahar	1	3	4
Shiva Mandir	1	17	18
Tamsariya		2	2
Total	**22**	**83**	**105**
Percent	**20.95**	**79.05**	**100**

The major migration occurs from within the district (24.10%). According to field survey 19.28% household of PAF migrated from Baglung and Syangja districts. Migration was also found from Palpa district and other neighboring hill districts (Table 6.18).

Table- 6. 18: Original District of Migrant Households

Original District	Migrant Households	
	No.	(%)
Baglung	16	19.28
Chitwan	3	3.61
Gorkha	3	3.61
Gulmi	5	6.02
Lamjung	4	4.82
Myagdi	1	1.20
Dhanusa	1	1.20
Nawalparasi	20	24.10
Palpa	7	8.43
Syangja	16	19.28
Rupandehi	2	2.41
Parbat	4	4.82
Kathmandu	1	1.20

–Brahamin, Magar, Gurung and Chettri, –are the major caste/ethnic group of migrated population. The other caste includes Tamang, Tharu, Biswokarma and Damai (Table 6.19).

Table 6.19: Migrant Households by Caste/Ethnic Group

Caste/Ethnic Group	Migrant Households
Brahmin	40
Chhetri	7
Gurung	7
Magar	12
Tamang	2
Tharu	3
Biswokarma	3
Damai	4
Others	5
Total	**83**

Of the surveyed households, the migrant households have been in their current place of residence for various durations. Of the 83 migrant households, 25.30% migrated to the current place of residence since the last five years, 7.23% migrated before 5 to 10 years and 27.71% migrated before 10 to 20 years and 39.76% households have been living in the current place of residence since more than 20 years (Table 6.20).

Table -6.20: Duration of Residence in the Current Place among Migrant Households

VDCs	Duration of Residence				Total Households
	Last 5 Years	5-10 Years	10-20 Years	> 20 Years	
Amarapuri	3		6	7	16
Devchuli	1			1	2
Dhaubadi				1	1
Dibyapuri	1			2	3
Dumkibas	5		5	6	16
Gaindakot	1			1	2
Makar		1	4		5
Mukundapur	4	1	4	1	10

Nayabolan	2	1	1	2	6
Rajahar	2	1			3
Shiva Mandir	1	2	3	11	17
Tamsariya	1			1	2
Total	**21**	**6**	**23**	**33**	**83**
Percent	**25.30**	**7.23**	**27.71**	**39.76**	

Source: Household Survey, 2011.

6.3.2 Economic Information

6.3.2.1 Occupation/Employment

Agriculture, service (salaried job), wage employment and business/small industry are the main sources of livelihoods of the surveyed households. Agriculture is the main occupation of 26.21% of the economically active population, followed by service (19.56%), wage employment (10.08%), business and small industry (1.81%). Nearly 22.18% of the economically active population is students and 20.16% of the economically active population is engaged in household work (Table 6.21). The economically active male population is comparatively higher (51.41%) as compared with female economically active population (48.59%).

Table 6.21: Occupational Composition of the Surveyed households

Main Occupation	Male		Female		Total	
	No.	%	No.	%	No.	%
Agriculture	56	21.96	74	30.71	130	26.21
Business and small industry	5	1.96	4	1.66	9	1.81
Labour/Wage (In Country)	21	8.24	6	2.49	27	5.44
Labour/Wage (Outside Country)	21	8.24	2	0.83	23	4.64
Service (Inside Country)	26	10.20	9	3.73	35	7.06
Service (Other Country)	58	22.75	4	1.66	62	12.50
Student	57	22.35	53	21.99	110	22.18
Household Works	11	4.32	89	36.92	100	20.16
Total	**255**	**100.00**	**241**	**100.00**	**496**	**100.00**

Source: Household Survey, 2011

Table 6.22: Types of Business/Cottage Industry and Average Monthly Income

VDCs	Type of Business and Avg. Monthly Income				
	Grocery Shop	Cottage Industry	Workshop	Tea Shop	Total Nos.
Amarapuri	3			1	4
Devchuli		1	1		2
Dhaubadi		2			2
Dibyapuri					-
Dumkibas			2		2
Gaindakot					-
Makar					-
Mukundapur	1	1	1		3
Nayabolan					-
Rajahar			1		1
Shiva Mandir		1	1	1	3
Tamsariya		1			1
Total	4	6	6	2	18
Avg. Monthly Income (Rs.)	7,250/-	11,530/-	15,400/-	5,000/-	

Source: Household Survey, 2011

6.3.2.2 Ownership of House, Valuable Household Assets and Infrastructures

Household survey indicates that 99.04% of the surveyed households are living in their own house and remaining (0.95%) are living in rented house and their relatives.

Field study reveals that most of the houses of the project affected people are made of cement and bricks (45.71%) mud and stone bricks (27.62%), and wooden wall (13.33%). Regarding the roof type of the surveyed houses, about 58.10% are made with zinc plates, 11.43% are thatched, 13.33% are slate tiles and 17.14% are RCC. Of the houses about 52.38 % are one story's, 45.71 % are two storied and 1.90 % houses are three storied (Table 6.23). The field survey shows that floor of 50.48% houses are made up of mud, 46.67% are cement/tiles/marbles and 2.86% are slates/bricks.

Table 6.23: Types of Houses

VDCs	Wall Type					Roof Type				No. of Storeys		
	Cement & Bricks	Mud and Stone Bricks	Wooden Wall	Bamboo Wall	Hollow Block	Thatched	Zinc Plates	RCC	Slate Tiles	1	2	3
Amarapuri	11	3			3		10	6	1	8	8	1
Devchuli	3	4					6		1		7	
Dhaubadi		2					2				2	
Dibyapuri		3				1	2			1	2	
Dumkibas	11	3	1		1	1	10	5		8	8	
Gaindakot	1	1	1				3			3		
Makar	5		2	2	1	2	2	2	4	7	3	
Mukundapur	11	5	1				9	5	3	13	3	1
Nayabolan		2	2	2		4	1		1	6		

Rajahar	1	2		1		1	3			3	1	
Shiva Mandir	5	2	7	1	3	3	13		2	6	12	
Tamsariya		2							2		2	
Total	**48**	**29**	**14**	**6**	**8**	**12**	**61**	**18**	**14**	**55**	**48**	**2**
%	**45.71**	**27.62**	**13.33**	**5.71**	**7.62**	**21.82**	**110.91**	**32.73**	**25.45**	**52.38**	**45.71**	**1.9**

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Bicycle, mobile phone, radio, CD/DVD cassette player and television are the most common assets owned by the PAFs. According to the households survey, 76.19% households have own bicycle, 93.33% own mobile phone, 69.52% own cupboard, 76.19% own television and 37.14% surveyed households have own CD/DVD player. Similarly, a few PAFs own valuable assets such as motorcycle/scooter, Freeze /freezer, Computer/printer, Telephone and Camera etc. (Table- 6.24).

Table- 6.24: Percentage of Households Having Household Assets

Assets	Ownership (%)		No. of HHs
	Yes	No	
Telephone	6.67	93.33	7
Mobile phone	93.33	6.67	98
CD/DVD/cassette player	37.14	62.86	39
Television	76.19	23.81	80
Computer/printer	14.29	85.71	15
Bicycle	76.19	23.81	80
Motorcycle/scooter	20.95	79.05	22
Freeze /freezer	18.10	81.90	19
Cabinet/cupboard	69.52	30.48	73
Radio	51.43	48.57	54
Camera	11.43	88.57	12

Source: Household Survey, 2011

6.3.2.3 Food Security

The project area is food deficit area due to the lack of the irrigation facilities and traditional agriculture practices. Only 48.6% of the surveyed households could grow enough food for their consumption in a year (Table 6.25)

Table - 6.25: Food Sufficiency Status of PAFs

VDCs	Sufficiency		
	Yes	No	Total No. of HHs
Amarapuri	7	10	17
Devchuli	3	4	7
Dhaubadi	2	-	2
Dibyapuri	-	3	3
Dumkibas	6	10	16
Gaindakot	-	3	3
Makar	8	2	10
Mukundapur	11	6	17
Nayabolan	-	6	6
Rajahar	2	2	4
Shiva Mandir	11	7	18
Tamsariya	1	1	2
Total	51	54	105

Source: Household Survey, 2011

Of the surveyed households, about 14.8% reported food deficiency of 6-9 months, 44.4% for more than 9 months. Similarly, about 40.74% reported food shortage for less than 5 months (Table 6.26).

Table -6.26: Food Deficiencies of the Surveyed Households

VDCs	Food Deficit Months				
	< 3	3-5	6-9	> 9	Total No. of HHs
Amarapuri	-	5	3	2	10
Devchuli	2	2	-	-	4
Dhaubadi	-	-	-	-	0
Dibyapuri	-	2	1	-	3
Dumkibas	1	2	4	3	10
Gaindakot	-	-	-	3	3
Makar	-	-	-	2	2
Mukundapur	1	3	-	2	6
Nayabolan	-	-	-	6	6
Rajahar	-	2	-	-	2
Shiva Mandir	-	2	-	5	7
Tamsariya	-	-	-	1	1
Total	**4**	**18**	**8**	**24**	**54**
%	**7.41**	**33.3**	**14.8**	**44.4**	**100.00**

Source: Household Survey, 2011

Strategy for the fulfilment of the food deficiency period

Of the surveyed households, 53.70% work as wage labor, 12.96% take loan and about 7.41 % depend on income of business to cope their food deficiency. Similarly, 9.26% of the households sell their household assets to meet their food requirements. Therefore, it reveals that a large proportion of the households is poor and depends heavily on income of wage employment, sell of assets and loan to fulfill their subsistence (Table 6.27).

Table -6.27: Strategy of the Surveyed Households to Cope with Food Deficiency Period

VDCs	Strategies						
	Loan	Wage Labor	Sell of HH Assets	Business Income	Salary	Others	Total No. of HHs
Amarapuri	1	4	1	1	2	1	10
Devchuli	1	3					4
Dhaubadi							
Dibyapuri		3					3
Dumkibas	2	3	2	1	1	1	10
Gaindakot		2				1	3
Makar		2					2
Mukundapur		2	1	2	1		6
Nayabolan		5				1	6
Rajahar		2					2
Shiva Mandir	3	2	1		1		7
Tamsariya		1					1
Total	**7**	**29**	**5**	**4**	**5**	**4**	**54**
%	12.96	53.70	9.26	7.41	9.26	7.41	**100**

Source: Household Survey, 2011

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Family Debt

Family debt is one of the major indicators to identify the economic status of a family. Having no debt or small amount of debt indicates the healthy economic status of the family. However, it also depends on the purpose of the debt. According to the household survey data 67.61% (71) households have family debt for various purposes (Table- 6.28).

Table 6.28: Debt Status of the Surveyed Households

VDCs	Debt Status		
	Yes	No	Total No. of HHs
Amarapuri	15	2	17
Devchuli	3	4	7
Dhaubadi	2	-	2
Dibyapuri	3	-	3
Dumkibas	6	10	16
Gaindakot	2	1	3
Makar	6	4	10
Mukundapur	10	7	17
Nayabolan	4	2	6
Rajahar	4	-	4
Shiva Mandir	15	3	18
Tamsariya	1	1	2
Total	**71**	**34**	**105**

Source: Household Survey, 2011

Of the households who have taken loan, 25.35% have taken it for food and clothing, 22.54% have taken for education of their children and 7.04% for house maintenance. The other reasons for taking loan are purchase of land, health treatment and migration (Table 6.29).

Table 6.29: Reason for taking loan by the surveyed households

VDCs	Reason								
	House repair	Migration	Animal Husbandry	Education	Health Treatment	By Land or House	Marriage /rituals	Food/ Clothing	Total No. of HHs
Amarapuri		2		5	2	3	1	2	15
Devchuli	1			1		1			3
Dhaubadi				1	1				2
Dibyapuri				1	1		1		3
Dumkibas	1	1		2	1			1	6
Gaindakot		1		1					2
Makar	1	1		1		1		2	6
Mukundapur	1	1	3	2	1			2	10
Nayabolan					2			2	4
Rajahar			1			2		1	4
Shiva Mandir	1	1		2	3			8	15
Tamsariya			1						1
Total	**5**	**7**	**5**	**16**	**11**	**7**	**2**	**18**	**71**
%	7.04	9.86	7.04	22.54	15.49	9.86	2.82	25.35	100.00

Source: Household Survey, 2011

6.3.3 Income Source, Annual Income and Expenditure of PAFs

Average Annual Income

The weighted average annual income of surveyed households is NRs 152,682. The contribution of off-farm is 87.13%, agriculture 7.32 % and livestock 5.54% to the total household income (Table 6.30). The non agricultural/off form sources of income are business/trade, services, labors/wage, remittance, Small scale and cottage industries, and Pension/ senior citizens allowance (*Briddha Bhatta*).

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Table - 6.30: Annual Average Incomes of PAFs

VDCs	Annual Average Income from Different Sources							
	Agriculture		Livestock		Non-Agriculture		Total	
	NRs	%	NRs	%	NRs	%	NRs	%
Amarapuri	5,882	3.51	12,520	7.46	149,400	89.03	167,802	100.00
Devchuli	27,978	15.10	14,637	7.90	142,714	77.01	185,329	100.00
Dhaubadi	47,375	22.85	7,000	3.38	153,000	73.78	207,375	100.00
Dibyapuri	17,700	13.86			110,000	86.14	127,700	100.00
Dumkibas	9,337	5.80	6,593	4.10	145,000	90.10	160,930	100.00
Gaindakot			5,833	3.76	149,333	96.24	155,166	100.00
Makar	3,470	2.80	1,250	1.01	119,400	96.20	124,120	100.00
Mukundapur	18,798	12.40	12,089	7.97	120,700	79.62	151,587	100.00
Nayabolan					114,333	100.00	114,333	100.00
Rajahar	21,426	12.65	3,500	2.07	144,500	85.29	169,426	100.00
Shiva Mandir	6,637	4.77	12,124	8.72	120,263	86.51	139,024	100.00
Tamsariya	10,250	7.84	7,500	5.74	113,000	86.42	130,750	100.00
Average	**11,177**		**8,459**		**133,046**		**152,682**	

Source: Household Survey, 2011

Remittance, wage/labor, agriculture, animal husbandry, pretty trade/business, pension and cottage industry are the major income sources of PAFs. According to households' survey, remittance (38.96%) is the predominant income source of PAFs (Table 6.31). Similarly, the other important income sources of the surveyed households are service (18.17%), daily wages (11.23%) and agriculture (7.32%).

Table- 6.31: Income sources of PAFs

Income Source	Avg. Income	%
Agriculture Income (Net Income from Cereals and Cash Crop Production)	11,177	7.32
Animal Husbandry (Sale of Animals, Milk and Milk Products)	8,459	5.54
Service	27,742	18.17
Daily wages/porter	17,150	11.23
Pension and Briddha Bhatta	10,346	6.78
Business/trade/petty business (shop, retail shops)	9,523	6.24
Cottage industry	6,761	4.43
Remittance	59,482	38.96
Others	2,042	1.34
Total average income	152,682	100.00

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Source: Household Survey, 2011

Average Annual Expenditure

The expenditure of the surveyed households could be broadly categorized under two headings: expenditure on food items; and expenditure on non-food items. Non-food expenditure items, in turn, can be broadly grouped as fuel and light; (kerosene and electricity); and other (education, medicine, clothing, festivals, transportation).

The annual weighted average expenditure of the surveyed households is NRs 1,-23,037. Food items form the largest expense category, accounting for 42.65% of total reported expenditure. The expenses of non food items like clothing, education, medicine, festivals, fuel, transportation and water/electricity are 12.51%, 12.18%, 6.11%, 10.64%, 4.86%, 7.72% and 3.33% respectively (Table 6.32).

Table -6.32: Average Annual Expenditure of the PAFs

VDCs/Municipality	Expenditure Headings (%)								Total Expend
	Food Items	Clothing	Education	Medicine	Festival	Fuel	Water/ Electricity	Transport /Others	(NRs)
Amarapuri	39.99	11.67	11.28	8.06	9.93	6.55	3.58	8.94	145,146
Devchuli	38.55	11.12	12.53	5.40	8.92	8.35	2.57	12.56	129,699
Dhaubadi	33.89	10.17	13.93	11.30	9.41	1.36	3.01	16.94	132,800
Dibyapuri	31.93	22.41	18.22	3.37	13.87	4.50	1.48	4.22	88,936
Dumkibas	43.90	12.00	12.05	8.76	11.34	3.26	3.84	4.85	121,302
Gaindakot	38.62	15.15	15.45	8.02	5.94	6.24	3.21	7.37	112,198
Makar	51.47	11.76	10.33	4.55	10.34	3.60	2.43	5.51	116,506
Mukundapur	37.70	12.49	15.30	3.48	12.10	5.40	4.17	9.36	133,721
Nayabolan	57.27	7.42	10.61	9.37	9.90	1.59	2.77	1.06	94,282
Rajahar	39.05	15.04	16.43	5.39	10.10	4.31	2.74	6.96	111,400
Shiva Mandir	44.76	14.05	8.87	5.39	11.41	4.42	2.87	8.21	117,808
Tamsariya	45.93	12.53	14.41	4.18	10.44	6.26	2.92	3.34	119,750
Percentage/Avg.	42.65	12.51	12.18	6.11	10.64	4.86	3.33	7.72	**123,037**

Source: Household Survey, 2011

Requirement of Average Income of PAFs

The households were asked regarding their required monthly household income in order to meet basic requirements of their family (food, clothing and other basic requirements). Of the respondents, about 55.23% said below NRs. 10000 per month and 16.19% said NRs. 10000 to 15000 per month and 4.76 % above 25000(Table 6.33).

Table - 6.33: Required Monthly Incomes of the PAFs

VDCs	HHs by Required Monthly Income (Rs.)						
	Upto 5000	5-10000	10-15000	15-20000	20-25000	>25000	Total No. of HHs
Amarapuri	1	4	7	3		2	17
Devchuli		5	2				7
Dhaubadi				2			2
Dibyapuri	3						3
Dumkibas	2	12	1			1	16
Gaindakot		3					3
Makar	1	6	3				10
Mukundapur		9	1	5		2	17
Nayabolan	4	1	1				6
Rajahar	1	3					4
Shiva Mandir	3	13	2				18

Tamsariya		2					2
Total	15	58	17	10	-	5	105

Source: Household Survey, 2011

6.3.4 Sources of Energy

Fuel wood is the main source of energy for cooking and electricity for lighting for the households of the project area. Of the surveyed households, 80.95% use fuel wood as source of energy for cooking. Similarly, 12.38% households use LPG and 6.67% use bio gas for cooking (Table 6.34).

Table -6.34: Source of Energy for the Surveyed Households for Cooking Purpose

VDCs	Source					
	Fuel wood		Bio Gas		LPG	
	N	%	N	%	N	%
Amarapuri	14	82.35			3	17.65
Devchuli	7	100.00				-
Dhaubadi	2	100.00				
Dibyapuri	3	100.00				
Dumkibas	14	87.50	2	12.50		-
Gaindakot	3	100.00				
Makar	7	70.00	3	30.00		-
Mukundapur	7	41.18			10	58.82
Nayabolan	6	100.00				
Rajahar	4	100.00				
Shiva Mandir	16	88.89	2	11.11		
Tamsariya	2	100.00				
Total	85	80.95	7	6.67	13	12.38

Source: Household Survey, 2011

Regarding source of fuel wood 84.71% collect fuel wood from community forest, 12.94% collect from private forest and 2.35% purchase from the local markets (Table -6.35).

Table -6. 35: Source of Fuel wood for the Surveyed Households

VDCs	Source					
	Com. Forest		Private Forest		Purchase	
	N	%	N	%	N	%
Amarapuri	13	92.86			1	7.14
Devchuli	7	100.00				
Dhaubadi	1	50.00	1	50.00		
Dibyapuri	3	100.00				
Dumkibas	10	71.43	3	21.43	1	7.14
Gaindakot	3	100.00				
Makar	5	71.43	2	28.57		
Mukundapur	7	100.00				
Nayabolan	2	33.33	4	66.67		
Rajahar	4	100.00				
Shiva Mandir	16	100.00				
Tamsariya	1	50.00	1	50.00		
Total	72	84.71	11	12.94	2	2.35

Source: Household Survey, 2011

The monthly consumption of fuel wood of the surveyed households varies from less than 200 Kg to more than 600 Kg. Of the surveyed households, 12.94% use less than 200 kg, 60% use 200-400 Kg, 16.47% use 400-600 Kg and 10.59% use more than 600 Kg fuel wood per month for cooking (Table 6.36).

Table 6.36: Monthly Consumption of Fuel Wood by the Surveyed Households

VDCs	No. of HHs by Monthly Consumption (in Kg.)				Total HHs
	< 200 Kg	200-400 Kg	400-600 Kg	>600 Kg	
Amarapuri	4	8	1	1	14
Devchuli			6	1	7
Dhaubadi		1		1	2
Dibyapuri		2	1		3
Dumkibas	1	10	1	2	14
Gaindakot	1	2			3
Makar	1	5	1		7
Mukundapur	1	5		1	7
Nayabolan	1	5			6
Rajahar	1	3			4
Shiva Mandir	1	9	3	3	16
Tamsariya		1	1		2
Total	**11**	**51**	**14**	**9**	**85**
%	12.94	60.00	16.47	10.59	100.00

Electricity is the main sources of energy for lighting purpose of the surveyed households in the project area. Of the surveyed households, 96.19% have electricity connection. The other source of energy for lighting purpose is kerosene lamp 3.81% (Table – 6.37).

Table 6.37: Source of Energy for lighting Purpose

VDCs	Source			
	Electricity		Kerosene lamp	
	N	%	N	%
Amarapuri	17	100.00		
Devchuli	6	85.71	1	14.29
Dhaubadi	2	100.00		
Dibyapuri	2	66.67	1	33.33
Dumkibas	16	100.00		
Gaindakot	3	100.00		
Makar	9	90.00	1	10.00
Mukundapur	17	100.00		
Nayabolan	5	83.33	1	16.67
Rajahar	4	100.00		
Shiva Mandir	18	100.00		
Tamsariya	2	100.00		
Total	**101**	**96.19**	**4**	**3.81**

Source: Household Survey, 2011

6.4 Agricultural Information

6.4.1 Land Holding of the PAF

The total land holding of the surveyed household is 51.65ha. The average land holding per household is 0.49ha and per capita holding is 0.076 ha (Table 6.38).

Table -6.38: Landholdings of the Surveyed Households in the Project Area

VDCs	Total			Avg. Landholding (ha)	
	Landholding (ha)	Surveyed Households	Surveyed Population	Per Household	Per Capita
Amarapuri	7.48	17	122	0.44	0.061
Devchuli	6.2	7	51	0.89	0.122
Dhaubadi	2.86	2	25	1.43	0.114
Dibyapuri	1.25	3	17	0.42	0.074
Dumkibas	7.51	16	95	0.47	0.079
Gaindakot	0.15	3	14	0.05	0.011
Makar	4.56	10	60	0.46	0.076
Mukundapur	9.08	17	131	0.53	0.069
Nayabolan	0.33	6	28	0.06	0.012
Rajahar	1.28	4	20	0.32	0.064
Shiva Mandir	9.7	18	107	0.54	0.091
Tamsariya	1.25	2	13	0.63	0.096
Total /Average	**51.65**	**105**	**683**	**0.49**	**0.076**

Source: Household Survey, 2011

Landholdings of the PAFs by Type of Land

The surveyed households own and operate 51.65 ha land (Table 6.27). This land consists of three types, namely *Khet* (lowland – irrigated and un-irrigated), *Bari* (upland) and *Ghaderi* (plots for house construction). Out of that 69.02% are cultivated irrigated land and 6.25% are un-irrigated cultivated land (Table 6.39).

Table -6.39: Landholdings of the PAFs by Type of Land

VDCs	HH	Irrigated Khet	Unirrigated Khet	Bari	Ghaderi	Total	Ha/HH
Amarapuri	17	6.05	0.24	0.36	0.83	7.48	0.44
Devchuli	7	3.89	0.51	1.42	0.37	6.20	0.89
Dhaubadi	2	1.51	0.84	0.41	0.10	2.86	1.43
Dibyapuri	3	1.25	0.00	0.00	0.00	1.25	0.42
Dumkibas	16	4.53	1.18	0.68	1.12	7.51	0.47
Gaindakot	3	0.00	0.00	0.12	0.03	0.15	0.05
Makar	10	1.46	2.88	0.00	0.23	4.56	0.46
Mukundapur	17	8.18	0.16	0.27	0.47	9.09	0.53
Nayabolan	6	0.00	0.00	0.19	0.14	0.33	0.06
Rajahar	4	0.65	0.10	0.50	0.03	1.28	0.32
Shiva Mandir	18	7.01	0.34	1.76	0.59	9.70	0.54
Tamsariya	2	1.12	0.00	0.00	0.13	1.25	0.63
Total /Average	**105**	**35.65**	**6.25**	**5.70**	**4.05**	**51.65**	**0.49**

Source: Household Survey, 2011

Land holding Size of Households by the type of Ownership

The grouping of the surveyed households according to landholding size shows that the 61.90% households are marginal size farmers (having up to 0.5 ha land), 34.28% small size farmers (having 0.5 to 2.0 ha land) and 3.81% are medium size farmers (having 2.0 to 4.0ha land). Thus, marginal and small landholders comprise about 96.18% of the surveyed households. The land holding of marginal, small and medium size farmer is 24.82%, 56.83%, and 18.35% of the total landholding respectively (Table- 6.40).

Table -6.40: Distribution of Households by Landholding Size by the type of ownership

Landholding Categories*		Households		Total Landholding	
Category	Size of Holding (ha)	No.	%	Area (ha)	%
Marginal	Up to 0.5	65	61.90	12.82	24.82
	0.5 – 1.0	26	24.76	17.1	33.11
	1.0 - 1.5	9	8.57	10.66	20.64
Small	1.5 – 2.0	1	0.95	1.59	3.08
Medium	2.0 - 4.0	4	3.81	9.48	18.35
Large	> 4.0 ha.	0	0.00	0	0.00

Source: Source: Household Survey, 2011,

**Landholding categories based on Rural Credit Review Study 1991/92, Nepal Rastra Bank (Central Bank of Nepal), 1993.*

Landholding by Sex of Household Head

Of the affected households, 18.1% are female headed households and 81.9% are male headed households. Similarly, 90.38% of the operated land is belonged to the male headed households and remaining 9.62% land is belonged to the women headed households. The average land holding size of male and female headed households is 0.54 and 0.0.26 ha/Hhs respectively. The female headed households are only marginal and small size farmers (Table -6.41).

Table - 6.41: Landholding by Sex of Household Head

Landholding Categories		Number of Households		Total Area (ha)		Average Holding per Household (ha)	
Category	Size of Holding (ha)	Male-headed	Female-headed	Male-headed	Female-headed	Male-headed	Female-headed
Marginal	Up to 0.5	50	15	11.03	1.79	0.221	0.119
	0.50 - 1.00	23	3	15.27	1.83	0.664	0.610
	1.00 - 1.50	8	1	9.31	1.36	1.163	1.355
Small	1.50 - 2.00	1	-	1.59	-	1.590	-
Medium	2.00 - 4.00	4	-	9.48	-	2.370	-
Large	> 4.0 ha.	0	-	0.00	-	0.000	-
	Total	**86**	**19**	**46.68**	**4.97**	0.543	0.262

Source: Household Survey, 2011

Landholding by Caste/Ethnicity

Of the surveyed households, 45.71% land belongs to Brahmin while 26.02% Magar. The average land holding is 0.49 ha with highest in Magar community followed by Brahmin (Table- 6.42).

Table - 6.42: Landholding size by Caste/Ethnicity

Caste/Ethnic Group	Total Landholding (ha)	Households	Average per Household (ha)
Tamang	0.92	3	0.31
Tharu	7.75	14	0.55
Magar	13.44	17	0.79
Gurung	2.13	7	0.30
Kumal	0.17	1	0.17
Brahmin	23.61	43	0.55
Chhetri	1.10	7	0.16
Thakuri	0.03	1	0.03
Dalit (Damai/B.Ka./Musahar)	2.50	12	0.21
Total:	**51.65**	**105**	**0.49**

Source: Household Survey, 2011

The land transaction of the affected households is nil and according to available data not a single household has sold their land in last five years.

6.4.2 Major Crops Area and Agricultural Production

Paddy, wheat, maize, oil seeds, pulses and potato are the major food crops and cash crops cultivated by the surveyed households. In terms of area coverage, paddy cultivation ranks first. The percentage composition of land occupied by different crops like paddy, maize, wheat, pulses, oil seeds and potato is 44.04%, 16.60%, 12.58%, 12.12%, 10.34% and 4.32% respectively. Paddy is primarily grown in *Khet*. Similarly, maize is primarily grown in *Bari*, however nowadays its cultivation in *Khet* is also increasing in the project area. The average yield of the major crops like paddy, wheat, maize, oilseed, and pulses are 4.11MT/ha, 1.7MT/ha, 1.93MT/ha, 1.12MT/ha and 1.02MT/ha respectively (Table-6.43).

Table -6.43: Major Crop Area Coverage, Production and Yield

Description	Major Crops					
	Paddy	Wheat	Maize	Oilseeds	Pulses	Potato
Total area cropped (ha)	**28.57**	**8.16**	**10.77**	**6.71**	**7.86**	**2.8**
Percentage	**44.04**	**12.58**	**16.60**	**10.34**	**12.12**	**4.32**
Khet (ha)	*27.53*	*8.16*	*10.06*	*5.65*	*5.05*	*1.45*
Bari (ha)	*1.04*	-	*0.71*	*1.06*	*2.81*	*1.35*
Total production (MT)	117.3	13.9	20.8	7.49	8.03	6.9
Yield (MT/ha)	4.11	1.7	1.93	1.12	1.02	2.46

Source: Household Survey, 2011

6.4.3 Livestock Distribution

Livestock ownership is an integral part of agriculture and one of the major income sources for the surveyed households and about 83% households have livestock. According to household survey, of

the total livestock 16.05 % are cattle, 43.68% are goat/sheep, 32.11% are buffalo and 8.16 % are pig etc. The average livestock holding size of the surveyed households is 3.62 (Table -6.44).

Table 6.44: Livestock Distributions of the PAFs

VDCs	Type of Livestock						Fowls
	Cattle	Buffalo	Goat/ Sheep	Pig	Total	Average per HH	
Amarapuri	4	19	12		35	2.06	
Devchuli	1	19	39	17	76	10.86	46
Dhaubadi		8	1		9	4.50	
Dibyapuri		7	10	2	19	6.33	2
Dumkibas	2	23	37	1	63	3.94	27
Gaindakot				5	5	1.67	
Makar	5	5	21	2	33	3.30	19
Mukundapur	44	17	10		71	4.18	22
Nayabolan			4	3	7	1.17	12
Rajahar		3	9		12	3.00	7
Shiva Mandir	3	18	20	1	42	2.33	18
Tamsariya	2	3	3		8	4.00	
Total	**61**	**122**	**166**	**31**	**380**	**3.62**	**153**
Percent	**16.05**	**32.11**	**43.68**	**8.16**			

Source: Household Survey, 2011

6.4.4 Fruit Trees timber and fodder

Altogether 346 trees are recorded (including fruit tree, fodder and timber trees) with 105 surveyed households. Fruit trees are the sources of additional income of the surveyed households. Mango, Guava, Jamun and Litchi are the major fruit trees grown by the PAFs. Of the recorded trees about 57.23% are more than five years of age and 42.77% are less than five years (Table -6.45).

Table 6.45: Fruit Trees timber and Fodder

Tree Type	No. of Trees by				
	HHs	< 5 yrs	5 + yrs	Total	Percentage
Fruit Trees					
Guava	10	19	17	36	
Jamun	1		2	2	
Lemon	6	11	1	12	
Litchi	7	8	4	12	
Mango	34	45	24	69	
Sub total	**58**	**83**	**48**	**131**	37.86
Fodder Trees	32	102	87	**189**	54.62
Timber	15	13	13	**26**	7.51
Total	**105**	**198**	**148**	**346**	

Source: Fields survey, 2011

6.5 Drinking Water Health and Sanitation

6.5.1 Source of Drinking Water

The major sources of drinking water for the households of the area are tube-well, piped water and public tap. Of the surveyed households, 30.48% have access to piped water. Similarly, 35.24% households collect water from tube-well and 34.29% from public tap (Table-6.46).

Table 6.46: Source of Drinking Water of the Surveyed Households

VDCs	Source					
	Piped Water		Tube Well		Public Tap	
	N	%	N	%	N	%
Amarapuri	9	52.94	5	29.41	3	17.65
Devchuli	5	71.43			2	28.57
Dhaubadi	1	50.00			1	50.00
Dibyapuri	2	66.67			1	33.33
Dumkibas	5	31.25	8	50.00	3	18.75
Gaindakot	3	100.00				
Makar	1	10.00	7	70.00	2	20.00
Mukundapur	1	5.88	15	88.24	1	5.88
Nayabolan					6	100.00
Rajahar	2	50.00	1	25.00	1	25.00
Shiva Mandir	1	5.56	1	5.56	16	88.89
Tamsariya	2	100.00				
Total	**32**	**30.48**	**37**	**35.24**	**36**	**34.29**

Source: Household Survey, 2011

Among the surveyed households 96.19% reported that they have sufficient drinking water. The water scarcity is reported in Gaindakot area.

6.5.2 Sanitation

The level of awareness regarding the using toilets for personal hygiene and environmental sanitation has been gradually increasing in project area and among PAFs. Toilet facilities are found at about 81.90% of the surveyed households in the project area. The remaining 18.10% household use river side/, open fields (6.67%) and forest for defecation (11.43%).

Table 6.47: Location for Defecation by the Surveyed HHs

VDCs	Location					
	Own Toilet		Open Field		Forest	
	N	%	N	%	N	%
Amarapuri	17	100.00				
Devchuli	3	42.86	2	28.57	2	28.57
Dhaubadi	2	100.00				
Dibyapuri	3	100.00				
Dumkibas	13	81.25	1	6.25	2	12.50
Gaindakot	3	100.00				
Makar	6	60.00	3	30.00	1	10.00
Mukundapur	16	94.12			1	5.88

Nayabolan					6	100.00
Rajahar	4	100.00				
Shiva Mandir	17	94.44	1	5.56		
Tamsariya	2	100.00				
Total	86	81.90	7	6.67	12	11.43

Source: Household Survey, 2011

Most of the households in the core project area are aware of regarding for the waste management. Of the surveyed households, about 20.95% dump waste at safe location. Similarly, 50.48% burn it while 15.24% bury and 13.33% use other methods for waste management. The proportion of households managing waste at safe location is high in Dhabadi, Shiva Mandir and Gaindakot VDCs (Table-6. 48).

Table 6.48: Methods of Solid Waste Disposal in the Project Area

	Location							
VDCs	**Dump at Safe Location**		**Burn**		**Buried**		**Others**	
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Amarapuri	2	11.76	10	58.82	3	17.65	2	11.76
Devchuli	1	14.29	3	42.86	2	28.57	1	14.29
Dhaubadi	1	50.00	1	50.00				
Dibyapuri			2	66.67			1	33.33
Dumkibas	2	12.50	10	62.50	2	12.50	2	12.50
Gaindakot	1	33.33	1	33.33			1	33.33
Makar	3	30.00	3	30.00	2	20.00	2	20.00
Mukundapur	5	29.41	6	35.29	4	23.53	2	11.76
Nayabolan	1	16.67	3	50.00	1	16.67	1	16.67
Rajahar			3	75.00	1	25.00		
Shiva Mandir	6	33.33	9	50.00	1	5.56	2	11.11
Tamsariya			2	100.00				
Total	**22**	**20.95**	**53**	**50.48**	**16**	**15.24**	**14**	**13.33**

Source: Household Survey, 2011

6.5.3 Health

To assess health status of the family members of the affected households, data on seriously sick family members during the last 12 months was collected. Of the surveyed households, 37.14% reported family members seriously sick during the last 12 months (Table 6.49). The proportion of such households is high in Gaindakot (66.67%) and Dumkibas VDC (62.50%).

Table 6.49: Household Reporting Sick Family Members during 12 Months

	Sick					
VDCs	**Yes**		**No**		**Total**	
	N	**%**	**N**	**%**	**N**	**%**
Amarapuri	5	29.41	12	70.59	17	100.0
Devchuli	1	14.29	6	85.71	7	100.0
Dhaubadi	1	50.00	1	50.00	2	100.0
Dibyapuri			3	100.00	3	100.0
Dumkibas	10	62.50	6	37.50	16	100.0
Gaindakot	2	66.67	1	33.33	3	100.0
Makar	3	30.00	7	70.00	10	100.0

Mukundapur	6	35.29	11	64.71	17	100.0
Nayabolan	3	50.00	3	50.00	6	100.0
Rajahar	2	50.00	2	50.00	4	100.0
Shiva Mandir	5	27.78	13	72.22	18	100.0
Tamsariya	1	50.00	1	50.00	2	100.0
Total	39	37.14	66	62.86	105	100.0

Source: Household Survey, 2011

Of the households reported seriously sick family members about 53.85% were old while 35.90% were youth and 10.26% were children.

6.6 Knowledge, Attitude and Expectation

6.6.1 Knowledge

To assess attitude and expectation of the affected household's, questions were asked. This section describes attitude and expectation of the affected households. Regarding knowledge about the TL project, 69.52% had knowledge about the project and 30.48% had no knowledge about the project. Of the households who had knowledge regarding the project, 54.79% had received the information from NEA staff/Surveyors, 31.51% from neighbours and 13.70% from other source.

6.6.2 Attitude

Of the affected households, 60% have positive attitude and 13.33% have negative attitude and 13.33% are neutral regarding the project. Reason for negative attitude is low compensation, likely relocation from the area/site and difficulty to manage in new society.

6.6.3 Expectation from the Project

The affected households are expecting employment, good compensation, local development, and electrification from the project. Of the surveyed households, 25.71 % expecting employment, 46.67 % expecting good compensation, 20.95% expecting local development (Table 6.50). The local development includes support for drinking water, irrigation, health and education, construction of rural roads etc.

Table 6.50: Expectation of Local People from the Project

VDCs	Expectation			
	Good Compensation	Employment	Local Development	Others
Amarapuri	8	4	3	2
Devchuli	4	2	1	-
Dhaubadi	-	1	1	-
Dibyapuri	1	-	2	-
Dumkibas	10	5	1	-
Gaindakot	2	-	1	-
Makar	1	4	3	2
Mukundapur	7	4	5	1
Nayabolan	4	1	1	-
Rajahar	2	-	2	-

Shiva Mandir	8	6	2	2
Tamsariya	2	-	-	-
Total	**49**	**27**	**22**	**7**
Percentage	**46.67**	**25.71**	**20.95**	**6.67**

Source: Household Survey, 2011

6.7 Compensation

To know views of the affected households regarding compensation for loss of land/assets and use of compensation questions were asked. This section describes views of the affected households regarding compensation and its use.

6.7.1 Choice of Compensation

The households were asked regarding their willingness to receive compensation in cash or kind. Of the households a majority (67.62%) said that they are willing to receive cash compensation. However, 22.86% said land for land and 9.52% said house for house compensation (Table 6.51).

Table- 6.51: Choice of compensation

VDCs	Type		
	Cash	Land for Land	House for House
Amarapuri	13	3	1
Devchuli	6	-	1
Dhaubadi	1	1	-
Dibyapuri	2	1	-
Dumkibas	13	2	1
Gaindakot	2	-	1
Makar	5	5	-
Mukundapur	10	5	2
Nayabolan	5	-	1
Rajahar	2	1	1
Shiva Mandir	11	5	2
Tamsariya	1	1	-
Total	**71**	**24**	**10**
Percentage	**67.62**	**22.86**	**9.52**

Source: Household Survey, 2011

6.7.2 Use of Compensation

The households who are willing to receive cash compensation were further asked regarding the use of cash. Of the households, most (66.20%) said they will purchase land from the cash compensation and 25.35% said that they will use the compensation amount for the construction of their house. Similarly, 7.04% said that they will invest the compensation amount for trade and business and 1.41% reported that they will use this money to pay debt.

6.8 Residential status, Resettlement and Rehabilitation

6.8.1Residential status of PAFs

Household survey indicates that 99.05% households are living in their own house. Of the total households, 12.38% have expressed that they have residential house or land in the places rather than the project area where as 87.62% expressed that they have no any residential house or land elsewhere in Nepal expect in the project area (Table- 6.52).

Table - 6. 52: Households having Residential Land/House in Area other than the Project Area

VDCs	Yes	No	Total
Amarapuri	2	15	17
Devchuli	2	5	7
Dhaubadi	-	2	2
Dibyapuri	-	3	3
Dumkibas	4	12	16
Gaindakot	-	3	3
Makar	1	9	10
Mukundapur	3	14	17
Nayabolan	1	5	6
Rajahar	-	4	4
Shiva Mandir	-	18	18
Tamsariya	-	2	2
Total	**13**	**92**	**105**
Percentage	**12.38**	**87.62**	**100**

Source: Household and Field Survey, 2011

Of the surveyed households who have expressed of having residential land or house in the other place, 84.62% said that they have residential house or land in other VDCs of the project districts while 15.38% households said that they have residential house or land in other districts of Nepal.

6.8.2 Resettlement and Rehabilitation

During the household survey, the questions regarding the resettlement and rehabilitation issues were asked. Of the surveyed households 48.57% expressed that they are interested to relocate in other places if they have to leave their place or property for the project while 51.43% household expressed that they do not like to relocate in other place due to several reasons like neighbours, own business, property, etc (Table 6.53).

Table 6.53: Willingness of Households for relocation in the other places

VDCs	Yes	No	Total
Amarapuri	7	10	17
Devchuli	2	5	7
Dhaubadi	1	1	2
Dibyapuri	-	3	3
Dumkibas	10	6	16
Gaindakot	2	1	3
Makar	3	7	10
Mukundapur	5	12	17
Nayabolan	6	-	6

Rajahar	2	2	4
Shiva Mandir	11	7	18
Tamsariya	2	-	2
Total	**51**	**54**	**105**
Percentage	**48.57**	**51.43**	**100**

Source: Household Survey, 2011

Of the total household who don't like to relocate in other places 9.26% are due to loss of current business and service, 25.93% due to lack of land and house in new places, 3.70% feels problem of adaptation in new society and 61.11% are unwillingness due to nearby market and service facilities in the current place (Table 6.54).

Table 6.54: Reasons for Unwillingness to relocate in other place

VDCs	Reasons			
	Nearby Market and Service Centers and Physical Facility	Possible Loss of Current Business and Service	Adoption Problem in New Society	No Land and House in Other Place
Amarapuri	5	2	-	3
Devchuli	2	-	-	3
Dhaubadi	1	-	-	-
Dibyapuri	3	-	-	-
Dumkibas	2	1	-	3
Gaindakot	1	-	-	-
Makar	4	1	-	2
Mukundapur	7	1	2	2
Nayabolan	-	-	-	-
Rajahar	2	-	-	-
Shiva Mandir	6	-	-	1
Tamsariya	-	-	-	-
Total	**33**	**5**	**2**	**14**
Percentage	**61.11**	**9.26**	**3.70**	**25.93**

***So**urce: Household Survey, 2011*

CHAPTER-7: IMPACT ASSESSMENT

This chapter addresses the likely adverse and positive impacts of the construction and operation of Bharatpur-Bardghat 220 kV Transmission Line Project which will result in changes to the existing baseline conditions. This section has been divided into two subsections. The beneficial impacts are described in subsection 7.1 and adverse impacts are mentioned in 7.2.

7.1 Positive Impacts

7.1.1 Construction Phase

7.1.1.1 Local Employment

One of the major beneficial impacts of the project during the construction phase is generation of employment opportunity. Altogether 250 people will be deployed during the construction of the project, which includes 170 unskilled, 60 semi skilled and 20 skilled manpower. Estimated time for completion of the construction phase is 2 years. The availability of employment opportunity will increase the income level of the people and thus improve the living conditions. As there is prevalence of migration in the project area, the availability of employment opportunity at local level will help to minimize it.

The vegetation of the RoW will be cleared for the construction of tower foundation and stringing of wires in forest area which will also provide short term employment opportunity to Community Forest Users Group.

The magnitude of impact is considered to be moderate, extent is local and duration is short term.

7.1.1.2 Increase in Local Skills

For construction of the project, highly skilled technical persons will be deputed in the project sites for the efficient execution of the construction works. Local people who will work with these skilled people will get opportunities to learn from them. With the skills learned during the construction of the project, local people will be able to get employment in similar projects elsewhere in Nepal. Such skills will be obtained, particularly in erection of towers, stringing of line, driving and transportation of equipment. The magnitude of impact is considered to be moderate, extent is local and duration is long term.

7.1.1.3 Increase in Economic Opportunities

The employment opportunity, income from shops, house rental, increase demand for food grains, fresh vegetable, meat and other local consumption goods and rental/lease of land are the areas of income during construction period. Furthermore, local contractors will be deployed for different kinds of works which is considered positive impacts on the local economy. As a result of increased trade and business, significant amount of cash will be injected in to the local economy. The increase in trade and business will enhance the economic status of local people. The magnitude of impact is considered to be moderate, extent is local and duration is short term.

7.1.2 Operation Phase

7.1.2.1 Local Employment

The project will require people for operation and maintenance of the transmission line and substation and some of them will be hired locally. This will provide long term employment opportunity to the local people. Vegetation clearance will be necessary for regular maintenance of RoW. This activity will also provide short employment opportunity for the local people, thus providing some additional income. The magnitude of impact is considered to be low, extent is local and duration is long term.

7.1.2.2 National/Regional Economy

The transmission line project will evacuate the energy produced from Kali Gandaki HEP and other big hydro projects planned in the west to the east where demand is high, and provide reliable power supply in load centers in eastern region.

As such, the national economy will boost via productivity/opening of new businesses with the help of this electric power supply. Ahead, in future, power can also be transmitted or sold to India via this TL. In that regard, the revenue collection by exporting power someday via this TL will contribute/add to the national economy. The magnitude of impact is considered to be high, extent is local and duration is long term.

7.1.2.3 Expansion in Rural Electrification

The proposed transmission line will open the door for expansion of distribution networks through Bharatpur substation of Chitwan district and Bardghat of Nawalparasi district. It will help to expand the coverage of rural electrification in Nepal and develop the rural areas by providing electricity to the consumers. The magnitude of impact is considered to be high, extent is national and duration is long term.

7.1.2.4 Impacts Due to Low Potential of Lightening

The availability of high voltage electric power and earth wire will reduce possibilities of lightening in nearby areas and help to protect lives and property of people. The magnitude of impact is considered high, extent is local and of long duration.

7.1.2.5 Changes in the local economic activities

The availability of the power is likely to enhance the health and sanitation situation in the project area. The availability of power will provide opportunity for the better quality of life, possibilities of health care units/health post, opening of new market and trade centers, hotel, lodge etc. Therefore, the propose transmission line project is likely to provide the basis for the changes in the local economic activities. The magnitude of impact is considered moderate, extent is local and of long duration.

7.1.2.6 Increase in National Revenue

Power supply and use in the project area and adjoining area will increase electricity consumption and it is likely to contribute towards better national revenue collection like opening of local small scale industries and other potential industries in the project area. The magnitude of impact is considered moderate, extent is local and of long duration.

7.2 Adverse Impacts

7.2.1 Construction Phase

The adverse impacts during construction phase of the project are as follows:

7.2.1.1 Acquisition of Private Land

Due to the implementation of the project 0.673 ha private land (Table-7.1) will be acquired permanently for the construction of the 43 towers. Of the total affected private land, 95.25% will be Khet.

Table 7.1: Land Area Permanently Acquired for the Tower Pads

S.No.	Land Category	Area (ha)	Percentage
1	Khet	0.641	95.25
2	Bari	0.016	2.38
3	Ghaderi	0.016	2.38
	Total	**0.673**	**100.00**

7.2.1.2 Reduction in Agricultural Production

The acquisition of 0.673 ha of cultivated land will permanently reduce the production of 3.92 Mt food grain annually. This includes 2.63 Mt paddy, 0.66 Mt wheat, 0.30 Mt maize (Table 7.2).

Table-7.2: Permanent Agricultural Production Loss

S.N.	Crop types	Cultivated land	Percent of area loss	Actual production area loss (ha)	Productivity (MT/ha)	Production Loss (MT)
1	Paddy	28.57	2.24	0.641	4.11	2.63
2	Wheat	8.16	4.79	0.391	1.70	0.66
3	Maize	10.77	1.45	0.156	1.93	0.30
4	Oilseeds	6.71	2.33	0.156	1.12	0.18
5	Pulses	7.86	1.79	0.141	1.02	0.14
Total/average		**62.07**	**2.39**	**1.484**		**3.92**

Source: Fields survey, 2011

7.2.1.3 Land Loss of surveyed households

Out of the total 43 affected households due to land acquisition, 39 households (90.70%) will loss less than 10% of their total land holding where as 4 households (9.30%) will loss 10% to less than 25% of their total land holding (Table 7.3). Further, there are no households losing more than 25% of their total land. The average landholding size of the PAFs is 0.49ha.

Table 7.3: Affected HHs by percent of Land Loss

% Loss of Total Landholding	Towers	
	No.	(%)
< 10%	39	90.70
10 – 25%	4	9.30
25 – 50%	-	-
> 50%	-	-
Total:	43	100

Source: Household Survey, 2011

7.2.1.4 Loss of Land and Structures by Gender Category

Of the affected households, female heads 13.95% and male heads 86.05% households. The total land holding of the female headed households is 3.17 ha from which they will lose 2.96% (0.094 ha) of their total land whereas the male headed households will lose 2.33% (0.578 ha) of their total holding (Table 7.4). This indicates that female headed households will lose more land in proportion to male headed households (Table 7.4).

Table- 7.4 : Land Loss by Gender Category

S.N.	Type of Headed	Households	%	Total Area (ha)	Land Loss (ha)	%
1	Female Headed	6	13.95	3.17	0.094	2.96
2	Male Headed	37	86.05	24.8	0.578	2.33
	Total/Average	**43**	**100**	**27.97**	**0.672**	

Source: Household Survey, 2011

Construction of the project will displace 62 households which include 80.65% male headed and 19.35% female headed (Table-7.5).

Table-7.5 Structures Loss by Gender Category

Type of Headed	Households	Percentage	Households loosing Structures			
			House	Cowsheds	Kitchen	Toilet
Male Headed	50	80.65	43	26	12	23
Female Headed	12	19.35	10	6	3	6
Total	**62**	**100.00**	**53**	**32**	**15**	**29**

Source: Household Survey, 2011

7.2.1.5 Acquisition of House and other Structures

Construction of the project will involve removal of 62 houses and 41 cowsheds owned by 62 households. Of these, 1 is highly marginalized, 3 are marginalized, 21 are disadvantage group, 26 are advanced group and 11 are Dalits (Table 7.6).

Table - 7.6: Distribution of Households Losing Houses/Structures by Caste and Ethnicity

Caste	No. of Households							No. of Structures	
	Only Houses	House and other Structures	Cowshed Only	Toilet Only	Kitchen Only	Toilet and Kitchen	Total	Houses	Cowsheds
Brahmin	2	14	3	-	-	1	20	21	15
Chhetri	2	2	1	-	-	-	5	4	4
Thakuri	-	1	-	-	-	-	1	1	-
Tamang	2	1	-	-	-	-	3	3	2
Tharu	1	3	-	-	-	1	5	4	-
Gurung	-	4	-	1	-	-	5	4	5
Magar	3	7	1	1	-	-	12	13	11
Kumal	1	-	-	-	-	-	1	1	-
Dalit	6	4	-	-	-	-	10	11	4
Total	**17**	**36**	**5**	**2**	**-**	**2**	**62**	**62**	**41**

Source: Household Survey, 2011

Household Affected by Acquisition of Structures and Land

Of the 105 affected households, 17 will be affected due to acquisition of structures (house) and 43 by acquisition of land and 36 household will be affected by land and structures. Of the 62 households affected by structures, 36 will lose house, cowshed, toilet and kitchen whereas 17 household will lose house only and 5 household will lose cowshed only (Table 7.7). The detail of land and house acquired from the individual household and their holding is presented in Appendix- IV.

Table -7.7 Household Affected by Acquisition of Structures and Land

S.N.	Project Components	Type of losing Structure	Households
1	**RoW**	House and associated structures (all)	33
		House only	16
		Cowsheds only	3
		Toilet only	1
		Kitchen only	0
		Toilet and Kitchen only	2
		Sub-total	**55**
2	**Tower Foundation**	Land loss only	43
	-	Only House	1
	-	House and associated structures (all)	3
		Cowshed only	2
		Toilet only	1
		Kitchen only	0
		Sub-total	**50**
		Total	**105**

Source: Household Survey, 2011

Types of the affected structures

Of the total affected houses, 29 (46.77%) are Kachchi (Temporarily residential structures), 22 (35.48%) are semi-pakki and 11 (17.74%) houses are pakki (Permanent residential structures)**.** The Kachchi houses are made of Mud/Wood/Bamboo Wall with Thatch or Tiles Roof, Semi- pakki houses are made of Cement/Brick/Wooden Wall with Zinc Plate Roof and Pakki houses are made of Cement/Brick Wall with RCC Roof (Table 7.8). Similarly, all the associated structures (Cow sheds) are Kachchi type.

Table - 7.8: Affected Houses/Structures by Type

Caste/Ethnic Group	Affected Houses by Type*			Total
	Kachchi	Semi Pakki	Pakki	
Brahmin/Chhetri/Thakuri	9	13	4	26
Gurung and Magar	6	4	7	17
Tamang	2	1		3
Tharu	3	1		4
Kumal	1			1
Dalit (Damai/B.Ka., Sunuwar & Musahar)	8	3		11
Total:	**29**	**22**	**11**	**62**
Percentage	46.77	35.48	17.74	100.00

Note: *Kachchi = Mud/Wood/Bamboo Wall with Thatch or Tiles Roof, Semi Pakki=Cement/Brick/Wooden Wall with Zinc Plate Roof, Pakki=Cement/Brick Wall with RCC Roof.*

Area of Affected Structures

Of the affected houses, 37 houses are single floored, 25 houses are of double floored. The total area of the affected houses and cowsheds are 72437 sq feet and 13463 sq feet respectively. The average area covered by houses and cow sheds are 1168 sq. ft and 328.37 sq. ft. respectively.

The average area covered by the single floored houses ranges from 177 sq.feet to 1394 sq.feet. Similarly, the average area covered by double floors house is 1797 sq. ft. Moreover, all the affected cow sheds are of single floored type having an average area ranges from 143.14 sq. ft. to 592.75 sq. ft. (Table-7.9).

Table 7.9: Area of Affected Structures

Area	No. of Affected Houses	Affected Area						
		Houses (Sq.ft.)				Cowsheds (Sq.ft.)		
		Kachchi	Semi Pakki	Pakki	Avg	No.	Area	Avg.
Single Floor								
<300 Sq.ft.	7	849	392		177	14	2004	143.14
300-500 Sq.ft.	4	1568			392	19	6717	353.53
500-1000 Sq.ft.	16	4880	4103	1775	672	8	4742	592.75
> 1000 Sq.ft.	10	4802	5564	3572	1394			
Double Floor	25	20495	14897	9540	1797			
Total:	**62**	**32594**	**24956**	**14887**	**1168**	**41**	**13463**	**328.37**

Source: Fields survey, 2011

In addition to above structures, project will also acquire 30 nos. of toilets covering an area of 971 sq.ft. and 15 kitchens having an area of 2406 sq.ft.

Table- 7.10: Area of Affected Toilets and Kitchen

Area	Affected Area					
	Toilet (Sq.ft.)			Kitchen (Sq.ft.)		
	No.	Area	Avg.	No.	Area	Avg.
<300 Sq.ft.	30	971	32.37	15	2406	160.4
300-500 Sq.ft.	-	-	-	-	-	-
500-1000 Sq.ft.	-	-	-	-	-	-
> 1000 Sq.ft.	-	-	-	-	-	-
Total:	**30**	971	32.37	15	2406	160.4

Source: Fields survey, 2011

7.2.1.6 Loss of Private Trees

Altogether, 102 trees (including 30 fruit trees, 64 fodder trees, and 8 timber size trees) owned by 37 households will be lost due to the implementation of the project. Of the total lost trees 46.08% are less than five years and 53.92% are more than five years of age (Table- 7.10).

Table -7.10: Loss of Private Trees

Tree Type	No. of Affected Trees by				
	HHs	< 5 yrs	5 + yrs	Total	Percentage
Fruit Trees					
Guava	5	4	6	10	
Jamun	1		2	2	
Lemon	-			0	
Litchi	1		3	3	
Mango	8	8	7	15	
Sub total	**15**	**12**	**18**	**30**	29.41
Fodder Trees	15	35	29	64	62.75
Timber	4		8	8	7.84
Total	**34**	**47**	**55**	**102**	**100.00**

Source: Fields survey, 2011

7. 2.1.7 Impact on Community Structures, Facility, Services and Resources

Football ground, resting place (Chautari) and Senchen Chhyoling Gumba located at Shiva Mandir VDC ward no 8 (Z-541to Z-542) and Basundhara Devi Mandir located at Mukundapur VDC ward no 5 (Z-441 to Z-442) of Nawalparasi district will be affected by the implementation of the project. Similarly, a resting place located at Amarapuri VDC ward no 3 (Z-495 to Z-496) and two private temples located at Dhaubadi VDC ward no 7 also falls in the Row. These temples are of low height and of local significance.

Community infrastructures, facilities and services (e.g. health, education, communication and drinking water, community forest etc.) are important social resources that will be used by the construction workforce. However, as the size of construction workforce is 250, of them most are local and work nature is short term and site specific, the pressure on community infrastructures/facility and services is likely to be limited.

The implementation of the proposed project will affect 188 ha forestland mostly community forest from two project districts. Furthermore, there will be a low probability of use of forest resource by the workforce. Considering the nature of the project, loss of forest area with respect to total available forest area and availability of local labor, the likely impact on community resources is considered to be low, site specific and of short term.

7.2.1.8 Occupational health and safety

Construction related accidents are common in Nepal, primarily because of unsafe construction practices. Construction activities such as working in the hilly areas, river sides, cliff areas, erection of towers and stringing of line may cause accidents and injuries. Work related injuries and vehicle accidents are the likely impact expected due to implementation of the proposed project. The magnitude of impact is moderate, extent is site specific and duration is short term.

7.2.1.9 Impact on Lifestyle and Socio-cultural Practices

The implementation of the project may affect the lifestyle and socio-cultural practices and norms of the local communities. During construction of the project, local people will be exposed to the outside world to a greater degree through interaction with people of various lifestyles. An increased cash flow and the cash earning of workers could encourage spending on unproductive items.

Considering the required labor force, nature of work and limited duration of construction activities at each work site, the magnitude of this impact is expected to be low, extent local and duration short term.

7.2.1.10 Health and Sanitation

Manpower will be deployed for concreting of tower foundation, excavation and stringing of line. The excavation and concreting work for particular site will be carried out at 7-10 days interval. Hence, maximum number of people for particular area at a time will be 40 -50 for 5 to 7 days. The lack of proper sanitary measures in temporary camps will affects the health condition of the workers. The lack of proper sanitary measures and increase in waste and water pollution can lead to an outbreak of epidemics and diseases such as Jaundice, Typhoid, etc. Considering the manpower involved at duration of stay the magnitude of impact is considered to be low, extent is site specific and duration is short term. Furthermore recruitment of local people will also minimize this impact.

7.2.1.11 Loss of firewood, fodder and Timber from community forests

The implementation of the proposed project will affect 188 ha forest area of 2 project districts. Altogether 16,500 standing trees of various species and sizes will be felled by the project. Furthermore, the construction workers will also add pressure on local forest resources to fulfill their fuel wood and timber requirement.

As a result, there will be shortage of forest resources and most of the households of the area, particularly the indigenous caste/ethnic groups, Dalit, landless and marginal who largely depend on the forest resources for their subsistence will be affected. However the loss of forest cover in respect to total forest area is minimum the magnitude of impact due to reduction in forest resources is low, extent is site specific and duration is long term.

7.2.1.14 Conflict of interest & law and order situation

Due to the influx of workforce from different places and different ethnic groups, there will be possibilities of conflict of interest between the workers and project management and among the workers and local community. Local employment, information disclosure, wages rate, working hours are the few areas of conflicts. The employment in project varies based on the need of construction and some people may terminate once their services are not required for the project. The termination of any employed staff may create conflict of interest and affect law and order situation of the area. Likewise misbehave by the project workers with local people may create conflicts with local community and affect law and order situation. Conflicts are also seen in some of the project for the compensation and acquisition of RoW land and similar situation is also expected in this project. The magnitude of impact is considered to be low, extent is site specific and duration is short term.

7.2.1.15 Impact on Livelihood

About 79.19 % of the proposed alignment passes through the forest. The existing forest covered in the project area is large enough to support the demand of forest resources such as firewood and timber to the dependent households. Therefore, even cutting down a large number of standing trees is of little significance to the livelihood of the local people.

Most of the affected households are poor and marginal farmers. Agriculture, wage employment and remittance are the main sources of livelihood of the affected households. Due to the implementation of the project the total permanent land loss will be 0.673 ha resulting to loss of 3.92 Mt food grain annually. This will add further pressure on the majority of the PAFs household have already faced food deficit problem. Considering percentage loss of land and contribution of acquired land to the total agriculture income this impact is expected to be moderate, extent is site specific and duration is long term.

7.2.1.16 Impact on Market/Growth Centers and Urbanization

The transmission line is aligned more or less close to East-West Highway. People prefer to settle along the road side due to accessibility, physical facilities, security, and income generating opportunities. Therefore, urbanization is gradually increasing in the area. The changing pattern of agricultural land into residential plots is common in the project area. Business/trade, employment

opportunity, flow of remittances and increase of households income activities are the major pull factors of urbanization in the project area.

The settlements like Bhedabari, and Bhaisakhori of Mukundpur, Mudabas of Devchuli - Tandi of Nayabelhani, Suntandi of Dumkibas and Banda Khola of Makar VDC are the major centers that have high potentiality of developing as urban area. The other settlement lies close to alignment are British Camp of Gaindakot VDC, Hasaura of Shiva Mandir and Majhi of Amarapuri VDC is also having good potential for urbanization.

The transmission line could constrain the urbanization process because the land under RoW is not applicable for the construction of house and other structures however the RoW land can be used as cultivation only. The magnitude of impact is considered to be high, extent is site specific and duration is long term.

7.2.1.17 Impact on Gender and Vulnerable groups

Wage labors will be required for different construction activities of the project. The contractor, especially the sub-contractors, may hire non-local people due to cheap wage. They could also discriminate the local men, women and vulnerable group while hiring the wage labors. In general, the employment opportunity will be more to men in comparison to women as usual in other development projects of Nepal and this trend may continue in this project also.

The impact of the project construction is also expected on the poor, indigenous and disadvantage people who might be directly not affected by the project but affected in other ways such as price hike, shortage of consumable goods, social inferiority and less opportunity of project related benefits. The magnitude of impact is considered to be low, extent is site specific and duration is short term.

7.2.2 Operation Phase

7.2.2.1 Land Fragmentation and Farming Hindrance

The placement of one tower will occupy 0.0156 ha (12.5mx12.5m) of land. The towers constructed in cultivated area, especially those erected in the middle of land parcels pose hindrance while ploughing the agriculture field. The field may be cultivated by using human labor that will increase the cost of agriculture production. The placement of tower fragments the land which will reduce the land value, minimize the land uses and increase the cost of cultivation. This impact is expected at 43 towers located in cultivated land. The overall magnitude of impact is considered to be low, extent is site specific and duration is long term.

7.2.2.2 Land Use Restrictions

Based on current survey, a total 30.53 ha agricultural land falls within the RoW. Due to the safety reason, houses and other permanent structures are not allowed to construct within the ROW as per the Electricity Regulations 1993.

As the land will not be applicable for construction of house, the value of land especially in urban and semi urban area will be highly affected. According to local people, the commercial bank denied for collateral to the land under the ROW and the affected household will be unable to get loan against their land. It is difficult to quantify the level of impact on the pricing of the land because there are other factors too that would play the significant role. Thus, the overall magnitude of impact is moderate, extent is site specific and duration is long term.

7.2.2.3 Withdrawal or Decrease in Economic Activities

Construction of the project induced economic opportunities, which will benefit the local peoples, economy and the project area as a whole. At the end of project construction, these opportunities will be closed. Worker will lose the job and salary. Demand for local agricultural production by construction workers will be reduced. Community and local commodity transactions will be reduced.

The withdrawal or decrease in economic activity during operation and maintenance may affect the life style of the local people. Local people are habitual for more expenses due to the increased earnings of construction phase. They will face difficult to manage the lifestyle once the economic activities will reduce and earning will drastically decline. However, due to the linear nature of the project, the local labors will be hired at the different locations only for the short duration of time. Thus, the magnitude of impact is considered low because the economic activities are limited and are spread throughout the settlements of the alignment. The extent is site specific and duration is of long term.

7.2.2.4 Occupational health and safety hazards

During operation phase, the flow of current and the operation of substation make the people, in the immediate vicinity of the line, vulnerable to electrical hazards such as fire and electrical shocks. Furthermore, lack of training, operation and maintenance skill and unavailability of the necessary safety equipment may add further risk with safety regards. The public can be affected principally through their own acts, such as children climbing towers, high vehicles attempting to pass beneath the lines, surveyors using metal leveling staffs under the conductors etc. These risks have a low probability of occurrences, but a very high (terminal) significance to the individuals involved. The overall magnitude of impact is considered to be low, extent is site specific and duration is long term.

7.2.2.5 Livelihood

A total of 0.673 ha cultivated land will be permanently acquired by the project for the placement of towers and substations. Of the surveyed households 51.4 % have food deficit since their production is not able to meet the year round food requirement of their family. The acquisition of land for towers and substation will reduce 3.92 Mt food grain annually. This will add further pressure on the majority of the project affected households already facing food deficit problem. The loss of production will further reduce agriculture income of local people thus affecting livelihood. Since the affected households have other sources of income too, the magnitude of impact is moderate, extent is local and for long duration.

7.2.2.6 Electricity Hazards and Electromagnetic Impact

The high voltage and current carried by the proposed 220 kV transmission line will create electric and magnetic fields that will dissipate rapidly with increasing distance from the source. Transmission line tower heights and corresponding conductor heights above ground level, as well as the RoW width, are selected and designed to limit the electromagnetic radiation levels at ground level and at RoW edges to acceptable levels. The overall magnitude of impact is considered to be low, extent is site specific and duration is long term.

CHAPTER-8: MITIGATION AND ENHANCEMENT MEASURES

8.1 General

The project has its impact at two levels i.e., household and community. The project proponent will implement the proposed mitigation and enhancement measures as a prime responsibility. The adverse impacts that are not identified during the study, if later discovered during the construction and operation phases will be mitigated by the proponent at its own cost. The project will compensate for the loss of life and properties due to activities taken during construction and operation of the project.

In this section, following mitigation and enhancement measures are proposed to minimize the adverse impacts and enhance the positive impacts.

8.2 Enhancement Measures and Community Support Program

8.2.1 Priority to the Local Employment

As much as possible and as per their qualification and skill they possesses, the project will emphasize to hire the local people for the construction work. Due priority will be given to project affected families, disadvantage people and women. Altogether 250 people will be deployed during the construction of the project, which includes 170 unskilled, 60 semi skilled and 20 skilled manpower. The unskilled and semiskilled manpower will be recruited from local to the extent possible.

8.2.2 Community/ Social Support Program

Although these programs are not directly related to the project development, it has indirect consequences about project construction. Since large scale transmission line project is going to be implemented in their area, local people have certain expectation regarding the assistance in some of the development works. Health post support program, school support program, small scale drinking water and irrigation assistance and assistance for the renovation and development of religious and recreational places. In addition capacity building program for local institution (VDCs, NGOs, CBOs and clubs) working in community will also be conducted.

Rural Electrification

The field survey shows that almost all VDCs affected by the project are partially electrified with remaining few wards. Since NEA is also in electrification business, locals are expecting electrification in their area since they are losing their land and houses. The project will provide necessary fund to

concern district offices of Distribution and Consumer Services to expedite the electrification program in the affected VDCs.

8. 3 Mitigation Measures

8. 3.1 Construction Phase

8. 3.1.1 Compensation, Resettlement and Rehabilitation Assistance for Loss of Land, Assets, Private Trees and Standing Crops

The project will acquire 0.673 ha private land permanently. Likewise, 62 residential structures, 41 cow-sheds, 30 toilets and 15 kitchens will have to be relocated. All the affected assets will be properly recorded and verified by the project and delegated Government and community representatives. Census and asset information will be maintained in a computerized database to manage and monitor compensation activities.

Eligibility, Cut-off-date and Entitlement

All PAFs and affected peoples (APs) identified and recorded in the project-impact areas on the cut-off date (date of public notification for property acquisition in case of title holders and census survey date in case of non title holders) will be entitled for different types of mitigation measures proposed in this RAP. These include primarily the cash compensation at replacement value for the affected assets, and combinations of rehabilitation measures that are sufficient to assist them to improve or at least restore the pre-project income/living standards and production.

The entitlement matrix given below in this chapter summarizes the main types of losses and the corresponding nature and scope of entitlements in accordance with GoN and WB policies. Based on technical design, the detailed losses of land and/or non land assets (structures) have been used for determining actual impacts and replacement values of assets. These information~~s~~ will be used by the CDC for valuation and the negotiation of land and property value between the project and owners as per the legal framework.

Compensation Determination Committees (CDC)

All affected households will be compensated for their lost assets. As per legal requirements a Compensation Determination Committees (CDC) will be formed to undertake the valuation of assets. The CDC will consist of:

- A person nominated by GoN as chairman (usually, the Chief District Officer of concerned district), and the following as members:
- District Land Revenue (*Malpot*) Officer of concerned district,
- An expert of the electricity sector nominated by GoN,

- Representative of concerned VDC/Municipality,
- Person loosing assets or his representative,, and
- Representative of the project developer (usually the Project Manager).

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Valuation of Assets and Compensation

Land

Considering the limitations of the Land Acquisition Act, 2034 (1977), improvements will be made to the principles of valuation in consultation with the local administration, affected households and stakeholders. The compensation to be determined by the CDC will be at replacement value. To ensure this, the CDC will take account of prevailing rates in the local market, transaction values and price information provided in this RAP.

In general, the value of the land area occupied by transmission line RoW will be heavily devaluated. The CDC must consider this aspect while determining the rate for transmission line projects. Loss evaluation and compensation fixation must not be treated as in other infrastructure/development projects such as roads, drinking water, irrigation, etc. Furthermore, the ground conditions such as road head (number and type of road linking the affected land), type of land plot such as cultivated, residential (*Ghaderi*), commercial, etc., and possibilities of future expansion should be considered while determining the compensation rates.

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It was observed in some of the transmission line project that rate fixed by CDC could not address such ground realities and local people vehemently opposed to provide their land resulting in project delays and consequential huge economic loss to the nation. Therefore, CDC should formulate some mechanisms to handle case by case negotiation if demanded by the locals.

All the required procedures will be completed prior to implementation of the project. Apart from the rate fixed by the CDC, percentage loss of land of the households will also be a basis for compensation as per degree of loses.

The information of the land price collected during the SIA and RAP preparation is the main basis for valuation of assets. The prevailing average land price has been considered for the estimation purpose. Different rates have been considered for the tower pads located in different category of land. There are three types of land to be acquired i.e. *Khet* (Cultivated land), *Bari* (Un irrigated land) and *Ghaderi* (Residential plots). The total compensation cost of permanently acquired land (0.673 ha) is estimated to be Rs. 87, 95, 400 (Table 8.1).

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Table-8.1: Compensation for permanent land

Type of Land	Unite price/ha	Affected Land(ha)	Amount (Rs.)
Khet	13,000,000	0.641	8333000
Bari	9,000,000	0.016	144000
Ghaderi	19,900,000	0.016	318400
Total		**0.673**	**87,95,400**

Source: Fields survey, 2011

The figures provided in Table-8.1 serve as good references for the CDC to decide and negotiate the replacement value of affected properties that will be acquired by the project.

Obviously, higher rates are recorded for urban areas followed by semi-urbans and rural areas that seem to be quite realistic with the prevailing practice in the field and also scientific than an ad-hoc or single rate system which could generally invite conflicts on land prices across different areas within project area. The CDC, which also consists one member from District Land Revenue Office (LRO), also refers current transaction value of land and structures that have prevailed at free markets in each district. Once the CDC collects and verifies different rates established in the project area, it is only thereafter that the committee works out the compensation rates that best represent the replacement value for particular category of land.

Considering the nature of the project single payment will be made to individual households for the entire compensation money to avoid administrative problem.

Land for land compensation is not proposed in this project due to the small area of land to be permanently acquired from various affected families. It is also impractical and difficult to allocate similar piece of agricultural land in the vicinity of the project area.

Structures

Altogether 62 houses have to be replaced due to the implementation of the project. Compensation for the affected house is determined on the basis of type of house. The average price for different type of houses is given below. The cost for the structures has been estimated using community consensus valuation method based on construction cost by type of houses. The total compensation for the 62 houses is estimated to be Rs. 1, 90, 25,000 (Table-8.2).

Table-8.2: Compensation for affected house

Type of house	No. of house	Average price (Rs.)	Amount (Rs.)
Kachchi	29	125000	3625000
Semi-pakki	22	300000	6600000
Pakki	11	800000	8800000
Total	**62**	**-**	**1,90,25,000**

Source: Fields survey, 2011

The final valuation of the structure will be conducted by the CDC. There will be one representative of the District Housing Construction Department. Like land valuation, the committee will also consider the rate used in RAP.

Cowshed

Compensation will be paid for the 41 cowshed to be acquired by the project. The affected cowsheds are *Kachchi* type with thatched roof. The average price per cowshed is taken as Rs. 25,000. The total estimated compensation cost for the cow shed is Rs.10, 25,000.

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Land occupied by structures

The average area covered by houses and cow sheds are 1168 sq. ft and 328.37 sq. ft. respectively.

The compensation for land occupied by the affected houses has been estimated based on the prevailing market rate as per type of land. On this basis, the total estimated compensation for the land occupied by house, cowshed, kitchen and toilet is 1, 65, 05,330 (Table 8.3).

Table-8.3: Compensation for land occupied by structures

Types of structures	Occupied Area(Sq.fit)	Occupied Area(Ha)	Average price/ha	Amount (Rs.)
House	72437	0.67	19900000	13391989
Cowshed	13463	0.13		2489009.1
Toilet	971	0.01		179516.29
Kitchen	2406	0.02		444815.85
Total	89277	0.83		1,65,05,330

Source: Fields survey, 2011

Private Trees

Due to the implementation of the project, altogether 102 standing trees will be lost including 30 fruit trees, 64 fodder trees, and 8 timber- sized trees. The average price for fruit trees, fodder and timber trees has been determined based on the findings of public meetings, households' survey and key person interview conducted at the project site. One time compensation will be paid for the permanent loss of fruit trees, fodder and timber trees. The total cost of affected private trees is estimated to be NRs 1, 56,800 (Table-8.4).

Table 8.4: Compensation of Private Trees

S.N	Type of Trees	Total No	Average Price/tree	Total price
1	Fruits Tree	30	2000	60000
2	Fodder Trees	64	1200	76800
3	Timber Trees	8	2500	20000
	Total	**102**	-	**1,56,800**

Source: Field Survey, 2011

Standing crops

The project will compensate the loss of agricultural production in the RoW based on the actual loss. It is difficult to make assessment of such losses at this stage. Hence, a lump sum provision in budget will be made to compensate the loss.

Religious and Community Infrastructure

Football ground, resting place (*Chautari*), Senchen Chhyoling Gumba, Basundhara Devi Mandir and two private temples will be affected by the project. Local people have agreed to relocate these religious and community structures in nearby area with better facilities. The estimated relocation cost is Rs. 12, 00,000 (Table-8.5).

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Table-8. 5: Compensation for community and private infrastructures

Community Structures	Quant	Unit Price (NRs)	Amount
Football ground	1	50000	50000
Resting place	2	25000	50000
Senchen Chhyoling Gumba	1	300000	300000
Shiva Mandir	1	200000	200000
Basundhara Devi	1	200000	200000
Temple	2	200000	400000
Total	**8**		**1200000**

Source: Field survey, 2010

Assistance to Different Categories of Households Losing Land

Different types of assistance have been proposed for different category of affected households as follows.

i) Household losing less than 10% of their total landholding

There are altogether 39 households who will lose <10.0% land. These households are under the category of marginally affected group and will be compensated for their land loss at replacement value as determined by CDC. Besides this, no additional mitigation/enhancement measures will be provided for these households. However, due priority will be given for employment during construction.

II) Household losing more than 10% of their total land holding

As per the defined criteria household losing more than 10.0% of their holding are considered as severely affected families. There are altogether 7 households fallsing under severely affected category. The three missing household during the time of survey were also considered under this category. These households will receive following assistance apart from the cash compensation. These households will be compensated for their land loss at replacement value as well as provided assistance to improve their livelihood.

Livelihood assistance

Each household, apart from the land compensation, will be provided one--time livelihood assistance of NRs. 15,000.

Agriculture Training and assistance

As these households still own large part of their remaining agriculture land, they will be provided agriculture assistance to increase their land productivity. The assistance will include agriculture and fresh vegetable training to one family member of each household and inputs support including hybrid seed, small agriculture tools etc.

Livestock Training and Assistance

Since agriculture and livestock are integral part of rural economy, the affected households will be also provided livestock training and assistance. As Chitwan and Nawalparasi district has high potential of poultry farming, extensive training on poultry farming along with other livestock (goat/pig) is proposed. In addition, the affected household will be provided a seed--money equal to NRs. 15,000- to start business poultry/goat/pig farming.

Priority for employment

First priority will be given to the family members of the households for employment in project construction.

Assistance to Households Losing Houses

Construction of the project will involve the removal of 62 houses owned by 53 households. The project proponent will provide compensation at replacement cost for the structures acquired by the project. This will include compensation for land occupied by the structure and cost of the structure. Owners will have the rights to use salvage materials from the affected buildings. The value of salvaged materials will not be deducted from the compensated amount.

Regarding the displacement of affected households, only 48.57% of surveyed households have expressed that they are interested to be relocated in other area if they have to leave their place or entire property for the project while 51.43% households expressed that they do not like to be relocated in other place due to several reasons like neighbors, own business, property, etc. This

figure indicates that most of the affected households wanted to resettle voluntarily. Considering the fact that only small piece of land and structure will be acquired by the project and their major land and property remain with them in the area, suitable compensation package along with rehabilitation measures are proposed for the households affected by the acquisition of structures.

House Rent Allowance

A house rent allowances for 6 months will be paid to the concerned households at the rate of Rs. 2500/month assuming that a new house will be constructed within that period.

Transportation Allowance

The affected household will be provided Rs.15,-000 transportation allowances for transportation of goods and materials.

Displacement Allowance

The households, which require relocation, will receive a housing displacement allowance equal to per capita income (per capita income is taken as $ 316.82 which is equivalent to Rs. 26,771(@ 1$= NRs. 84.5 on Dec, 2011) of the base year based on the calculation for a household of 6.14 members. Business allowance is not applicable in the case of proposed project.

Basic technical skill training

One family member from each household will be provided technical training in the areas of driving, plumbing, house wiring, repair and maintenance and motor rewinding as per their interest from government recognized training institutions.

Employment Opportunity

Apart from the provision mentioned above, the rehabilitation of affected households will be additionally supported through the preferential access to employment opportunity.

8.3.1.2 Awareness Program

The proponent will implement awareness programs to minimize the likely impacts on lifestyle and public health through hoarding boards, pamphlets, leaflets, etc. The workers will be instructed to act in a responsible manner during and after the working hours, respecting the rights, property, socio-cultural norms and practice of local people. The awareness program will incorporate the problem associated with social and cultural disintegration and awareness regarding girls trafficking, sexually transmitted disease (STD), HIV/AIDS, health and sanitation, education (formal, non-formal), family planning. The program will also include awareness regarding proper use of compensation money, job availability in project and its nature, importance of project with regards to local and national scenario etc.

8.3.1.3 Health and Sanitation

Permanent camp will be made on rented house which include toilet, drinking water and other facilities to accommodate the project staffs. Toilets will be constructed in temporary camps at the rate of approximately 8 people in each toilet and drinking facilities will be installed prior to occupancy. Health check-up of workers and documentation of health status will be made periodically. Priority will be given to the local people in project works to minimize the impacts on health and sanitation. Drinking water available for the camps will be tested and necessary treatment will be made to make safe drinking water. A three-days health sanitation awareness training will be implemented for the project workers living in camps in coordination with local NGOs. Similarly, local health posts will be supported with basic medicines to compliment the GON medicine supply.

8.3.1.4 Occupational Safety Measures

The construction area will be declared as hard hat area and all the necessary precaution and warning sign will be placed at work site. This area will be restricted for the entry of unauthorised people. The project proponent will provide hard hat, eyeglass, safety boot, safety belt, fire fighting accessories, caution signals and other safety equipment as required at particular site and work area. First aid kits will be maintained, for preliminary treatment at site. Services of district level government hospital located Bharatpur and Bardghat will be taken as required. For serious injuries especial arrangement will be made to send the injured person to nearest hospitals and if required evacuation will be made to Kathmandu and or abroad. Safety training will be implemented and any loss of life or injury will also be compensated as per prevailing rules.

8.3.1.5 Law and Order

Due coordination will be made to the local and district level administrative units of GoN. The existing facilities of GoN will be used to maintain the law and order as required. The proposed awareness program will also minimize this impact to some extent.

8. 3.1.6 Reduction in Agriculture Production

The land required for the placement of project structures will be acquired in advance and if there exist any crop during the time of acquisition, payment will be made for the actual loss of such crop as per current market price. Compensation will also be paid to the affected landowners equivalent to loss of one crop in the affected land if compensation is not paid on due time and there will be loss of one seasonal crop.

8. 3.1.7 Community Facilities and Resources

Compensatory plantation in nearby area to expand the forest cover as well as income of the concern community forest will minimize the impact for the loss of forest resources. Fast growing and income generating species suitable to the area will be selected for plantation in consultation with the CFUGs.

It will help to fulfill the demand of fodder, fuel wood as well as increase income level of the local users.

The drinking water for the camp will be taken without affecting local water requirement. In addition small scale drinking water assistance will be provided to the area under community support program.

Similarly, assistance will be also provided for community infrastructure improvement/development (drinking water, irrigation, school, health post, rural electrification etc.) of the area under community support program.

8. 3.2 Operation

8. 3.2.1 Land Use Restriction

Altogether 40.53 ha cultivated private land falls within RoW on which land use restriction will be imposed. (The land within ROW will be utilized as usual by the respective landholders except for tree plantation and construction of permanent residential structures.

The private landfalls in RoW will be compensated as per the rate fixed by CDC headed by the Chief District Officer. The committee will be formed as per Electricity Regulation 2050. The current practice for the compensation of ROW is 10% of the amount of the affected area based on current market rate.

8.3.2.2 Awareness Program

Awareness program will be implemented to aware the people about the proper use of money, nature of job, project activity and its role in local economy etc. This program will be implemented once during the first year of project operation in each project district. Organization of lectures, distribution of pamphlets, audiovisuals, and posters are the methods proposed for awareness program. The project proponent will give priority in keeping locals for the positions needed during operation phase.

8.3.2.3 Land Fragmentation and Farming Hindrance

The erection of towers/placement at center of farmland will be avoided to the extent possible.

8.3.2.4 Electromagnetic Field

The ROW shall be maintained as per Electricity Regulation. Very sensitive and fully redundant transmission line protection will be adopted for the proposed line. A precautionary approach for reducing the effect of EMF will be adopted by following the guidelines for limits on magnetic field stipulated by the International Radiation Protection Association (IRPA). No houses or other buildings will be permitted within the ROW, with existing houses and other structures relocated outside the RoW. Awareness programs on safety will be conducted for project staff and local residents at key localities in the project area. Fencing of towers at some locations (e.g. near schools, highway crossings etc), warning signs and metal guard structures on the towers are proposed to dissuade people from climbing or tampering with towers.

8. 3.2.5 Occupational Health and Safety

Safety equipment required for the operation of the transmission line will be provided. During the maintenance, major area will be restricted for entry of unauthorized person to avoid disturbances and risk. Hard hat, eye glass, safety boot, ear plugs, good electric light system, good earthling devices, fire fighting accessories, caution signals, safety belt and other safety equipment as required at particular site and work area will be provided. 30 meter ROW will be strictly maintained to minimize the likely risks of conductor breakage, induced voltages, etc. Appropriate protection system and equipment will be installed at the substation to ensure the automatic isolation of the line in case of abnormal conditions. A safety awareness program will be implemented at the beginning of project operation to inform the local people about the likely risk and safety measures to be applied. As mentioned in baseline the proposed route maintain reasonable distance to settlement and public places except at few locations where it is unavoidable

8.4 Entitlement Matrix

Through the acquisition of private and community assets, the Bharatpur –Bardghat Transmission Line Project will affect property owners, their dependants and local community. This Entitlement Framework accordingly specifies compensation and/or rehabilitation measures for two units of entitlement individuals including affected individuals/ households and the local community.

Compensation will be provided to the affected private property. Furthermore, the owners of affected house will be provided house rent allowance for 6 months, and one time dislocation and transportation allowances. Apart from the compensation for acquired land, assistance will be provided to the households losing >10.0% of land and reduction in agriculture for reestablishment and improvement of livelihood. Similarly, the women headed and Dalit households losing land will be supported for reestablishment and improvement of livelihood.

This assistance will include livestock/agriculture training to one member of each household and assistance (hybrid seed, small agriculture tools and goat/pig, poultry), technical training in the areas of plumbing, house wiring, driving etc. as per their interest.

Loss of private and community assets will be valued and compensated based on the entitlement matrix given in Table 8.6 below.

Table 8.6: Entitlement Matrix

Type of Loss	Entitlement Unit	Description of Entitlements	Implementation Measures
1. House and Other Structures			
1.1 Loss of Residential Structures	Titleholder	▪ Cash compensation for loss of house at replacement cost, according to house type. ▪ Compensation for land occupied by the structure	▪ Due consultation will be made with Department of Housing and Planning for the valuation of structures ▪ CDC will be formed in each district and compensation rates established by CDC will be provided to the concerned households. ▪ Compensation will be paid at replacement cost and depreciation will not be deducted ▪ Salvaged material will be allowed to use by concerned HH without deduction from compensation amount. ▪ 50% compensation will be paid in advance and remaining 50% will be paid after demolishing the structure ▪ House rent allowance for 6 months will be provided ▪ Transportation allowance for transportation of goods and materials and dislocation allowance will be paid to minimize the impacts. ▪ In addition, these households are also entitled to receive additional training and benefits allocated for the household losing more than 10% of their land ▪ Notice to vacate will be served at least 35 days prior to acquisition date ▪ To ensure fair compensation, determination of rates will be done not more than one year prior to property acquisition.
1.2 Loss of other private structures	Titleholder	Other private structures include: cowsheds, toilet, kitchen etc Cash compensation for full or partial loss at replacement cost, according to structure type. Compensation for land occupied by the structure	Loss of structures other than houses does not entail payment of other allowance. Compensation determination by CDC Notice to vacate will be served at least 35 days prior to acquisition date
1.3 Loss of residential	Non-title holders	Compensation at replacement value for loss of structures.	Compensation determination by CDC and advance notice to vacate the structure

Type of Loss	Entitlement Unit	Description of Entitlements	Implementation Measures
and other private structures		However, compensation will not be paid for the lands illegally occupied by the structure.	In addition to cash compensation for structures, livelihood improvement/ income restoration measures i.e. employment, skill training will be considered.
2. Land			
2.1 Loss of private land due to acquisition for tower pads	Titleholder	Provide compensation at full replacement cost. Provide cash compensation at full replacement cost based on current market rate or Government rate whichever is higher.	CDC will be formed in each district and compensation rates established by CDC will be provided to the concerned households. A list of affected and entitled persons and the area of land loss is required.
2.2 Loss of private land	Non title holder/tenant	Non titleholder/tenant with traditional land use right and recognized by GON and who are in process of getting land ownership title will be provided compensation for land. Resettlement assistance in lieu of compensation for land occupied (land, other assets, employment) at least restore their livelihoods and standards of living to pre-displacement levels.	In addition to compensation, non title holders will also be eligible for resettlement assistances for income/ livelihood restoration. CDC to decide the status of such non title holder/tenant as per the legal framework.
2.3 Temporary loss of private land	Titleholder	Compensation for crop, land productivity and other property losses for the duration of temporary occupation. Compensation for other disturbances and damages caused to property. Proponent/Contractor to negotiate a lease agreement on the lease rate with the owner for temporary acquisition of land. Land should be returned to the owner at the end of temporary acquisition period, restored to its original condition or improved as	A lease contract will be signed by the Contractor with the affected landowner, specifying: - Lease period - Annual inflation adjustments; - Frequency of payment; and -Land protection and rehabilitation measures. The land will be returned to the owner at the end of temporary acquisition, restored to its original condition.

Type of Loss	Entitlement Unit	Description of Entitlements	Implementation Measures
		agreed with owner.	
3. Other Privately Owned Resources			
3.1 Loss of non perennial crops	Titleholder; other evidence of ownership	Advance notice to harvest crops. Net value of crops where harvesting is not possible.	Crop market values and production losses will be determined by the project office (based on prevailing market price and in consultation with local stakeholders such as District Agriculture Office)
3.2 Loss of privately-owned trees and perennial crops	Titleholder; other evidence of ownership	Advance notice to harvest crops. Net value of crops where harvesting is not possible. Compensation will be given to the privately owned trees at per prevailing market price.	Crop market values and production losses will be determined by the project office (based on prevailing market value and in consultation with local stakeholders such as District Forest Office and District Agriculture Office). The value of tree will be determined in Consultation with District Agriculture Office for fruit trees and District Forest office for fodder and timber trees respectively. The proponent will assist the affected owners and communities with the reestablishment of new trees through its compensatory plantation program and other perennial crops.
4. Community Structures and Resources			
4.1 Community buildings and Structures	Local Community	Community buildings and structures include: Gumba, temples playground , rest place etc.	Restoration of affected community structures to at least previous condition, or replacement in areas identified in consultation with affected communities
4.2 Trees	CFUGs or local community	Compensatory plantation as per the Procedural Guideline for the Use of Forest land (2006) Restoration of access to community resources.	The proponent will conduct compensatory plantation @ 25 saplings for the loss of one tree and manage it for 5 years as per the Procedural Guideline for the Use of Forest land (2006). The planted area will be handed over to the concerned communities through District Forest Office after 5 years.
5. Rehabilitation Assistance			
5.1 Displacement of household	Titleholder/tenant	Housing displacement allowance for loss of own residential accommodation. -Dislocation allowance Transportation allowance	Displaced households will receive a house rent allowance for 6 months Dislocation allowance Transportation Allowance Allowances will be paid at the time of serving the notice to vacate.

Type of Loss	Entitlement Unit	Description of Entitlements	Implementation Measures
5.2 Loss of agriculture land	Titleholder Tenant/tenant	Assistance based on degree of the land loss	The following loss of agriculture land and agriculture income will apply to: 1. Household losing more than 10 % of their total agriculture land: - Compensation of land loss and priority for employment in the project construction **Livelihood Assistance:** Seven household (including 3 missing households) will receive NRs. 1500/hh for their livelihood assistance and the total cost is NRs. 1, 05, 000. **Agriculture Assistance and Training:** As these households still own their agriculture land, they will be provided agriculture assistance to increase their land productivity. The assistance will include agriculture training and assistance to one family member of each household and inputs support including hybrid seed, pest management, and use of fertilizer, irrigation techniques, appropriate cropping patterns, and livestock (goat/pig, poultry) based on their interest. The estimated cost of agriculture assistance and training is NRs.5,00, 000. **Livestock Training and Assistance** 7 households will be encouraged and assigned for Livestock training and assistance especially the pig, goat and poultry. The estimated budget is NRs. 4,05,000. **3. Household loosing Structures(House)** ***Skill Development Training*** One family member of each affected household will be provided technical training in the areas of driving-10 hhs, plumbing-10 hhs, house wiring- 23 hhs, and Repair and maintenance of Mechanical and electrical equipments' 10 hhs etc. as per their interest

Type of Loss	Entitlement Unit	Description of Entitlements	Implementation Measures
			from government recognized training institutions. The cost of skill development training is estimated to be NRs. 19,40,000. **Priority for Employment:** First priority will be given to the family members of the households for employment in project construction based upon the skills related to the transmission line construction works.
5.3 Vulnerable social categories	Affected households	Vulnerable social categories actually affected by the project will be identified as: - Dalits - Women headed households - Highly marginalized groups	Assistance in re-establishment and improvement of livelihood. Preferential employment during construction and operation to the extent possible. Details are presented in the VCDP report
6. Government Property			
6.1 Loss of infrastructure	Relevant agency	Facilities will be repaired or replaced.	To be undertaken in consultation with the relevant GON line agencies.
6.2 Loss of forest areas	Department of Forest/CFUGs	Mitigation by means of forestation.	Compensatory Plantation Program will be developed as a part of Environment Management Plan of the Project. To be undertaken in consultation with Department of Forest and District Forest Office
6.3 Loss of Government land	Relevant agency	No provision of compensation.	Consultation with relevant government line agencies.
7. General Counseling			
7.1 All project impacts	Communities, key stakeholders and affected HHs of the transmission line alignment	General counseling on project impacts; construction schedules and acquisition dates; valuation, compensation and grievance resolution mechanisms; construction employment procedures; and local development initiatives.	This will be achieved through the group meeting and consultation with local stakeholders etc. Cooperation with line agencies of GoN (Ministries, Departments, District Offices, DDC, VDC) to support effective project implementation, resource utilization and local development.

CHAPTER-9: INSTITUTIONAL ARRANGEMENT

9.1 General

This section outlines the institutional arrangement for SIA implementation. It also discusses monitoring requirements, before concluding an overview of the major planning, administrative and logistical requirements for the successful implementation of the SIA.

As the project authority, Bharatpur- Bardaghat 220 kV Project (BBTLP) will assume overall responsibility for the management procedures. Key activities to be undertaken to ensure effective implementation of resettlement, compensation and rehabilitation activities are mentioned below.

In BBTLP, there are a couple of key actors whose roles, functions and responsibilities are closely interlinked which requires them to work in a coordinated manner. The key actors and their roles are as presented below.

Key Actors	**Functions/Roles**	**Remarks**
NEA/ 220 kV Transmission Line/ SS Cons. Dept.	Central / national and corporate level policy making, including for land acquisition/ compensation	In coordination with DoED/Line Ministry and other high level bodies.
NEA/ESSD	Planning, supervision and monitoring of social safeguards programs; implementation of social mitigation and enhancement program, supervision and progress reporting of field works	In close coordination with the Project office at centre and field.
BBTLP / ESMU	Day to day planning and implementation of project construction and safeguard activities and progress reporting on a regular basis. ESMU to work proactively on all safeguard related issues in all stages.	ESMU to be set up as a wing of ESSD to carry out environmental and social monitoring of the project.
CDC	The CDC is a body with legal stand which will be responsible to fix the rates of the land and property acquisition, compensation, resettlement and rehabilitation.	Will work in close coordination with other actors of GRM viz ESMU, Land Acquisition Unit and LCF.
LCF	All LCFs will work to resolve local level issues on RAP implementation including compensation in close coordination with Project./ APs/CDC	The Project/ ESMU will coordinate and support LCFs to carry out their roles/ functions.
NGOs/Consultant	Specialized/ capable NGOs/Consultant to work responsibly to provide R&R assistance/ income restoration/ livelihood improvement.	Work in close coordination with APs/ ESMU/ Project

- Implementation of procedures to minimize adverse social impacts including acquisition of land and assets throughout the planning, design and implementation phases and accurately record all project-affected persons/households, by means of census and asset verification and quantification exercises, and the issuing of identification,
- Establishment of CDC and its procedures for the co-ordination of resettlement and compensation activities,
- Local Consultative Forum (LCF) will be established to address the social issues associated with the project. The objectives of this LCF will be to: (a) ensure ongoing dissemination of project information to affected households, (b) structure, regulate and strengthen communication

between affected households/communities, (c) involve affected households/communities and local government structures in social impact management, grievance resolution and monitoring,

- Distribution of copies of the approved entitlement policy, and follow-up community meetings to ensure full understanding of its contents,
- Co-ordination with other government line agencies to ensure effective delivery of mitigation and rehabilitation support measures, and
- Collaboration with NGOs to provide grassroots expertise and resources in the areas such as project information campaigns, awareness raising, community participation and mobilization, poverty alleviation, income-generation, and impact monitoring of the projects.

9.2 Organizational Framework

An organizational setup for SIA implementation is necessary for effective coordination to ensure compliance with policies and procedures, land acquisition and resettlement activities and implementation of mitigation measures. To ensure the achievement of these activities, organization for SIA implementation and management will occur at both central and district project level (Figure 9.1).

9.2.1 Central Level Arrangement

i) Environment and Social Studies Department

ESSD is one of the three departments of Engineering Services Business Group of NEA and executes all the activities related to identifying, conducting and coordinating environmental aspects of projects developed by NEA in all stages such as studies, design, construction and operation. This department will be responsible for the overall control of social management program of the project. This department will also be responsible for the coordination of work of the project at central level management of NEA and central line agencies. It is proposed that ESSD will implement monitoring program and some of the social mitigation work in coordination with concerned line agencies and local NGOs. The mitigation and social support program will be implemented by mobilizing local NGOs, Consulting firm Contractor and line agencies. The program coordinator will be responsible for overall coordination and implementation of the environmental and social mitigation programs. The program coordinator will be assisted by environmental and social expert at central and local level.

ii) Central Level Line Agencies

The central level line agencies such as Ministry of Energy, Department of Electricity Development have responsibility for the monitoring of project activities with regards to Environmental and Social Management, Mitigation and Monitoring Plan. ESSD will coordinate with central level line agencies regarding the monitoring work.

9.2.2 Project Level Arrangement

i) Project Manager

The BBTL Project Manager Office will be established under the organizational setup of NEA. The project manager will have overall responsibility regarding the implementation of SIA. He will be responsible for establishment of Compensation Determination Committee (CDC), Local Consultative Forum (LCF) and Environment and Social Management Unit.
The Project Manager will be responsible to make sure the allocation of necessary budget for the implementation of the program. He will be responsible for the overall coordination of the work and make final decision on environmental, social and public concern issues.

Under the Project Manager Office, a Land Acquisition and Rehabilitation Unit (LARU) will be established. The in-charge of unit will be responsible for the acquisition of land and house, asset valuation and verification, implementation of compensation and rehabilitation grant (house rent, transportation and dislocation allowances) and coordination of the work with District and Central level agencies with regard to acquisition of private property. The officer in-charge of the unit will also work as member of secretary of the CDC and member of LCF.- The LARU will also responsible for handling grievances as mentioned in Chapter-5.

ii) Bharatpur – Bardghat Environment and Social Monitoring Unit (HBTL- ESMU)

BBTL Environment and Social Monitoring Unit has been established under ESSD umbrella for day to day environmental and social monitoring of the project and coordination of work with VDCs, DDCs and district level line agencies. The unit has site office for day to day monitoring of the social and environmental impacts. The unit will implement environmental and social monitoring works directly through mobilizing of its site based staff.

iii) Compensation Determination Committee

A Compensation Determination Committee (CDC) will be formed to fix compensation for loss of land and private property. The CDC will comprise of Chief District Officer, District Land Revenue Officer, DDC Representative, BBTL Project Representative and PAP/HH Representative. The main functions of the CDC will be confirmation of entitled process, assessment/Identification of PAP/HHs, compensation determination for land and private property and grievance resolution.

iv) Local Consultative Forums (LCF)

Local Consultative Forums (LCFs) will be established to address the social issues associated with the project. The objectives of this LCFs will be to: (a) ensure ongoing dissemination of project information to affected households, (b) structure, regulate and strengthen communication between affected households/communities, (c) involve affected households/communities and local government structures in social impact management, grievance resolution and monitoring.

v) Construction Contractor

The construction contractor will be responsible for implementation of some of the social mitigation measures specified in his part and compliance with the tender clauses. He will be responsible for implementation of construction related mitigation measures such as occupational safety, recruitment of local labor, health and sanitation measures etc.

vi) District Level Line Agencies

The district level line agencies such as District Administrative Office, Land Revenue Office, District Development Committee Office, Agriculture Office, Forest Office and Education Office will be consulted regarding the implementation of RAP.

9.1.3 Donor Agency

Donor agency (s) will have specific responsible for the monitoring of compliance of loan agreement. The experts from donor agency will review the project plan and program, and make direct observation at site to make sure the implementation mechanism is going smoothly and public concerns are well considered.

CHAPTER-10: IMPLEMENTATION PLAN

10.1 Implementation Schedule

The BBTL Project will ensure that funds are delivered on time to CDC and the implementing consultants for timely preparation and implementation of SIA as applicable. The awareness program will be implemented at initial stage of project construction whereas the community support program will be implemented during project construction with major works in first year. SIA implementation schedule is presented in Table 10.1.

Table 10.1: SIA Implementation Schedule

S.N.	Tasks	2012				2013			
		1	2	3	4	1	2	3	4
1	Contract agreement with Contractors								
2	Route alignment final survey by Contractor								
3	Finalize list of affected people in RoW in consultation with PAPs/HHs								
4	Submit final list to CDO for compensation determination								
5	Notice publication of affected land for RoW								
6	Consultation, and grievance resolution committee formation								
7	CDC meeting and compensation determination								
8	Inform PAPs/HHs for the compensation claim								
9	Collect application from the PAPs/HHs for compensation of land falls in RoW								
10	Verify the application and prepare final list of PAPs/HHs								
11	Pay compensation for eligible PAPs/HHs								
12	Implementation of social awareness program								
13	Health and sanitation awareness and health checkup								
14	Rural electrification and other community support program								
15	Monitoring of SIA imp. progress								
16	Monitoring and evaluation of SIA imp.								
17	SIA completion report								

CHAPTER-11: MONITORING AND EVALUATION

11.0 General

One of the main objectives of the project is to improve living standard of the affected persons/households or at least restore their livelihood to pre-project level by implementing appropriate mitigation measures. Effective monitoring and evaluation systems will be introduced to ensure the proper monitoring of the environmental and social activities.

11.1 Monitoring

Monitoring will be conducted to: (a) record and assess project inputs and the number of persons/households affected and compensated and (b) confirm that the living standard of the affected persons/households improved or at least restored to pre-project level.

Monitoring of the social activities especially the compensation, resettlement and rehabilitation grant and other social parameters arises during project implementation will be conducted. Environment and Social Monitoring Unit (ESMU) will be established at site for day to day monitoring of the social impacts.

The unit will conduct monitoring work as per schedule for different parameters. The unit chief will maintain a record of all transactions in their database, followed by entitlement records signed by the affected persons/households and survey based monitoring of implemented social activities including resettlement and land acquisition progress. A performance data sheet will be developed to monitor social activities of the project at the field level. Field level monitoring will be carried out through:

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- Review of census information for project affected persons
- Consultation and informal interview with project affected persons/households
- Random sample survey of project affected persons
- Key informants interview
- FGD
- Public consultation

11.2 Monitoring Parameter, Method Schedule and Location

Land acquisition, compensation, resettlement and rehabilitation issues, damage of standing crop, occupational safety and employment are the major parameters of monitoring.

Table 11.1 Monitoring Parameters, Method, Schedule and Location

Parameters	Indicators	Method	Schedule	Location
A. Construction Phase				
Water supply	Chemical and bacteriological parameters such as E. Coli	Sampling and laboratory analysis	6 months	Temporary camp and nearby hotels, settlement etc
Land Acquisition	Acquisition of land, lease of land and temporary disturbances in land	Cross checking the list of compensation	Quarterly	Tower pad , RoW and leased area
House Acquisition	Relocation of house, compensation, use of construction material etc	Observation of new construction area, cross checking the list of compensation etc.	Quarterly	Affected area and relocation sites
Crop	Actual damage to standing crop or loss of cropping season for the particular area	Observation and discussion	Weekly	Tower pad , RoW and leased area
Economy	Local employment, rental, sell of consumable goods	Meeting and discussion with local communities	Quarterly	Project affected area
First Aid	Availability of first Aid	Observation and record review	Periodic as per construction schedule	Project site
Losing of life and disability	Compensation to losing of life and disability	Interview/observation	Periodic	Project site
Occupational safety	Adequacy of occupational safety measures (helmets, boots, warning signs etc.) and use of safety gears	Interview/observation	Periodic as per construction schedule	Project site
Employment	Employment of local labor including women and children	Cross checking the list of employment	Monthly	Project site
Camp site	Campsite management including lodging arrangement and campsite facilities	Site observation, interaction with laborers, contractors	Monthly	Permanent and temporary camps
Lease of land	Temporary leasing of private land	Site observation, contractors, check contract agreement	Monthly	Lease areas

Discrimination	Discrimination of wage rate between male and female workers	Interaction with labors, labor survey, record of wage payment	Monthly	Project site
Public land	Encroachment into public land like grazing land, forest, temples etc	Visit the identified public land interact with local people, take photographs	Quarterly	Project site
Migration	Migration /displacement of local people	Review of land holding records, discussion with local people	Quarterly	Project area
Accidents	Incidence of accidents/health hazards	Discuss with local people, health institutions' records	Quarterly	Project site
Land price	Changes in the land price, land use and agricultural practices, productivity and crop export	Discuss with farmers and extension workers, agricultural statistics of District Agriculture Office	6 months	RoW area
Social and Cultural practices	State of social harmony and social security (gambling, prostitution, alcoholism, narcotism etc.)	Police records, discussion with local residents	Quarterly	Project affected VDCs
Life style	Changes in the living standard of people	Interview with families, VDC records, discussion with local leaders, NGOs/CBOs	6 months	PAFs
Cultural and historical site	Condition of cultural and historical areas and aesthetic qualities	Visit the area, discuss with people, observation and photographs	Quarterly	Project affected VDCs
B. Operation Phase				
Employment	Employment of local labor including women and children	Site observation, attendance record, interaction with laborers and contractors	Annually	Project office
Health and safety	Use of health and safety measures	Site observation, interaction with laborers, contractors	Annually	Project office
Wages rate	Discrimination of wage rate between male and female workers	Interaction with laborers, labor survey, record of wage payment	Annually	Project workers

Migration	Migration /displacement of local people	Review of land holding records, discussion with local people	Annually	Project area
Health hazards	Incidence of accidents/health hazards	Discuss with local people, health institutions' records	Annually	Project site
Land price	Changes in the land price, land use and agricultural practices, productivity and crop export	Discuss with farmers and extension workers, agricultural statistics of District Agriculture Office	Annually	Project area
Living standard	Changes in the living standard of people	Interview with families, VDC records, discussion with local leaders, CBOs	Annually	PAFs
Cultural and historical site	Condition of cultural and historical areas and aesthetic qualities	Visit the area, discuss with people, observation and photographs	Annually	Newly constructed temples
Economic status	Changes in economic condition of local people due to withdrawal of economic opportunity	Interview and discussion	Annual	Project affected families

11.3 Reporting

The monitoring unit will be responsible for the preparation of the Social Monitoring Report. The report will be distributed through Project Managers office to the concerned agencies. The unit will prepare following reports.

Construction Phase Social Report

The construction phase social report will be prepared on quarterly basis and annual social report will be prepared at the end of each calendar year. A final social monitoring report will be prepared after the completion of the construction work.

Operation and Maintenance Phase Report

Operation and maintenance phase social report will be prepared for the one year following the construction. The monitoring unit will prepare this report for project. The report will describe status of implemented mitigation measures, problems and recommended solution. The report shall clearly identify where operational mitigation measures are not being met or where mitigation efforts are inadequate to protect social impacts. Unanticipated deleterious impacts of the projects will be clearly identified. Measures to solve problem will be proposed and be funded by NEA.

11.4 Impact Evaluation

- After completion of the construction work (2 years) an evaluation study will be conducted. The evaluation work will focus on following aspects:
- Evaluation of social activities implementation focusing on resettlement and land acquisition activities
- Evaluation of social activities by summing up the outcomes of activities as per the SIA report
- Socioeconomic survey to measure changes in living standard of the affected households/persons compared to pre-project situation

CHAPTER-12: PROGRAM COST, SOURCE OF FUNDING, BUDGETARY PROCESS AND TIMING OF EXPENDITURE

12.1 Mitigation and Enhancement Cost

The estimated cost of mitigation measures and community support program is Rs. 67.41 million. The cost required for land acquisition, compensation and rehabilitation measures is covered in RAP prepared for the project. Likewise the cost required for the implementation of Vulnerable Community Development Plan is covered under VCDP prepared for the project. To avoid duplication in budget the cost proposed for SIA excludes cost mentioned in RAP and VCDP documents prepared for the project. The SIA implementation and monitoring cost will be covered under total environmental and social management cost of the project as per approved EIA.

Table-12.1: Estimated Cost for SIA Implementation

S.No	Social Programs	Unit	Quantity	Rate (NRs)	Cost (NRs. million)		
					Construction	Operation	Total
A.	Mitigation Measures						
	Community safety awareness program	Nos	4	100000	0.2	0.2	0.4
	Health and sanitation awareness and health checkup	Nos	2	200000	0.4	0	0.4
	Land Use Restriction	ha	40.53	13966667	56.61	0	56.61
	Sub-total -A				**57.21**	**0.2**	**57.41**
B.	Community Support Program						
	Rural electrification	LS			2.5	2.5	5
	Health post and school support program, small scale drinking water and irrigation assistance and assistance for the renovation and development of religious and recreational places and capacity building training to local VDCs	LS			4	1	5
	Sub-total -B				**6.5**	**3.5**	**10**
	Total (A+B)				**63.71**	**3.7**	**67.41**

12.2 Funding Source

Nepal Electricity Authority will be responsible for overall mitigation measures. The cost will be paid under the annual budget head of NEA. However, it is expected that the World Bank will provide funding to support these community support programs, which are generally beyond the capacity of NEA and local partners.

12.3 Budgetary Process and Timing of Expenditure

The expenses required for the SIA will be made within 2 years of project construction with major expenses on land acquisition, compensation and rehabilitation measures on first year of the project development followed by second years. The major component of the mitigation measures is land use restriction cost, which will require at the 2nd year of project development (the end of construction) before charging the line.

CHAPTER-13: CONSLUSION

At present Nepal faces power deficit, due to severe imbalance in demand and supply of electricity in the country. The annual peak electricity demand is increasing with an average of 10% annually. It has led to load shedding since the last few years, and this situation is expected to continue in the coming 5-6 years. This has resulted in severe loss to the productive sectors like industries and commerce in addition to the inconveniences to the consumers.

Nepal Electricity Authority (NEA) is constructing 220 kV transmission line from Bharatpur-Bardghat to strengthen the power transmission network of Integrated Nepal Power System (INPS) thereby increasing the capacity of power flow from the west where the major generating stations exist or planned to the east where demand is high.

The proposed 220 kV Bharatpur-Bardghat Transmission Line is 73.5 km in length. The TL starts from the proposed New Bharatpur substation located at Aanptari, Bharatpur Municipality, Chitwan district and terminates at existing Bardghat substation located at Makar VDC in Nawalparasi district. The project covers one municipality of Chitwan district and 14 VDCs of Nawalparasi district.

Out of the total 73.5 km length of the transmission line, 79.19% falls along forest and bushes, 18.38% cultivated land and 2.43% rivers, roads & rocky areas.

The Social Impact Assessment (SIA) of the proposed project has been conducted based on field survey and review of secondary information. This SIA report is an outcome of the study conducted adhering to the existing acts, rules, regulations and guidelines pertinent to the study. Local employment, increase in economic opportunity, enhancement of transmission line network, expansion of rural electrification and contribution in national development are the major positive impacts identified of the project.

The major adverse socioeconomic and cultural environmental impact includes acquisition of 0.673 ha cultivated land owned by 43 households , 62 residential structures , 41cow-sheds, 30 toilets and 15 kitchens. Land use restriction in 40.53 ha private land falls in Row is the other adverse impacts identified on socio-economic and cultural environment.

Considering the size of the project and its national importance the social adverse impacts of the project are minimal. Proper mitigation and enhancement measures have been proposed to mitigate the identified adverse social impacts and enhancement measures to maximize the project benefits. Likewise community support program has been proposed to develop cordial relation with local people for smooth implementation of the project.

Therefore, the study concludes that implementation of the proposed project is socially feasible and there are no major social impacts that could not mitigated or minimized.