# chapter-I

# introduction

## 1.1 Background

Integrated Nepal Power System (INPS) has installed capacity of 697.8 MW of which 644.3 MW is hydropower, 53.4MW thermal and 0.1 MW solar energy (NEA 2010). Nepal Electricity Authority (NEA) is constructing 220 kV transmission line from Hetauda- to Bharatpur 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 line particularly enhances the existing Hetauda- Bharatpur 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. The project also aims to form a part of the envisaged 220 kV grid which the Power System has recommended. This will eventually help enhance the power exchange with India.

The proposed alignment passes through 8 VDCs and one municipality of Chitwan district and 2 VDCs and one municipality of Makwanpur districts. The estimated length of the transmission line is 75 Km. Right of Way (RoW) of the transmission line is 30m (15m on each side of centerline) as per Electricity Regulation and each tower will require an area of 12.5mx12.5m. Two substations will be constructed consisting one at Hetauda –Municipality and one at Bharatpur Municipality.

A total of 6.90 ha private land will be acquired by the project for the substation and angle towers. Of the total affected private land, 0.88ha will be acquired for the construction of towers and 6.02 ha for the construction of Hetauda substation.

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 Hetauda-Bharatpur 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 was 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 were to:

* 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 proposed Hetauda- Bharatpur 220 kV Transmission Line Project has a length of 72 Km. The Right of Way (RoW) is 30m with 15m on either side from the centerline of the TL project. The scope of the study is preparation of SIA report to fulfill the donor requirement for the funding of the project. The scope of the study is to collect site specific social data, identification of the impacts and preparation of mitigation measures to minimize the adverse impacts. The study covers both transmission line and substation area including area required for the temporary facilities.

## 1.4 Layout of the Report

This report contains 13 chapters. Chapter 2 contains the description of the project, chapter 3 outlines the study methodology, chapter 4 provides information on relevant policy and legal framework, chapter 5 describes about community participation and consultation, chapter 6 details baseline condition of the project area, chapter 7 details impact assessment, chapter 8includes mitigation and enhancement measures, chapter 9 details institutional arrangement, chapter 10 includes implementation schedule, chapter 11 describes monitoring and evaluation, chapter 12 details cost and budget and chapter 13 includes conclusion.

# CHAPTER-II

# Project Description

## 2.1 Project Location

The proposed project is located in two districts namely Makawanpur and Chitawan of Central Development Regions of Nepal (Fig. 2.1). The transmission line passes mainly through Churia range and plains of Terai. 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 at Bharatpur of Chitwan district which is located nearly at the other end of alignment.

## 2.2 Transmission Line Route

The proposed 220 kV Hetuda-Bharatpur Transmission Line is 72 km in length. The TL starts from existing Hetauda substation located at Hetauda Municipality Ward no 1 Chaukitole of Makwanpur district and terminates at the proposed Bharatpur substation located at Jaladevi Community Forest land at Bharatpur Municpality of Chitwan district. The proposed project also includes 2km long 4 circuits transmission line from Bhairabdanda to New Hetauda Substation located at Thanabharang ward 11 of Hetauda- Municipality. The proposed alignment passes through 8 VDCs and one municipality of Chitwan district and 2 VDCs and one municipality of Makwanpur districts (Annex I).

The major portion of the transmission line alignment crosses the forest area followed by cultivated land barren land, rivers and roads. Out of the total 72 km length of the transmission line, 56 km falls along forest and bushes including barren land, road, river etc and 16 km over the cultivated land.

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 separate aluminum conductor steel reinforced (ACSR). The vertical double circuit configuration tower will have an average height of 45 m and the standard tower base dimensions will be 12.5 m x 12.5 m from centre to centre of each tower leg foundation/ footing. 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) as per Electricity Regulation. The transmission line design features are given below.

##### Salient Features

Project**:** Hetauda-Bharatpur 220kV Transmission Line Project

District**:** Makwanpur and Chitwan

VDC/ Municipality**:** Basamadi Manahari, Piple, Bhandara, Birendranagar, Chainpur, Pithuwa, Jutpani, Shaktikhor Kabilas VDCs and Bharatpur & Hetauda-Municpality

Line Length**:** 72 kilometers

Span**:** 350 meters

No. of Tower**:** 226 (out of which 36 are located in

cultivated land)

Total area occupied by the Towers: 3.16 ha

Area to be acquired for Tower: 0.88 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**:** 42.45 meters

Circuit**:** Double

Conductor**:** ACSR BISON, Duplex

Insulator: Cap and Pin type

Earthwire**:** EHS 7/3.35

Foundation Type**:** Pad and Chimney

Foundation Area**:** 12.50 x 12.50 meters (approx. average per foundation)

Substation: 2 (Hetauda and Bharatpur)

Project Cost: 37.71 million US

Funding Agency: GON/World Bank

### 2. 3.1 Substations

***New Hetauda Substation***

NEA is constructing a new Hetauda substation at Ward no. 11 of Hetauda Municipality. A 220 kV transmission line from this substation to Bharatpur is under construction. The proposed expansion work will be conducted within the boundary of the substation and no additional land will be acquired.

***Bharatpur Substation***

This substation will be constructed in the forest land belonging to Jaladevei Community Forest. This site is located about 500m east along Narayanghat- Mugling Highway close to Ramnagar. Under this substation five 132 kV Line bays, one bus coupler, one 132 kV transformer bay, switch gears and lattice type dead end towers and steel structure for bus bars and various structures.

**Expansion of Existing Hetauda (old) Substation**

A new 132 kV line bay will be installed for interconnection with the new Hetauda Substation. The new bay will be erected next to the existing Bhartapur line bay. The entire construction work will be conducted within the area occupied by the existing substation and no additional area will be affected by expansion work.

**2.3.2 Line Towers**

Altogether 226 towers will be constructed 72 km length. 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 alignment 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

1. Erection of transmission towers.
2. Wire stringing

d. Bay expansion at Hetauda and Bardaghat substations.

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.

**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.

### 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.

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### 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. Similarly, spoil generated from the substation construction will be used to the switchyard location where borrowed earth materials have to be filled and compacted for the site grading.

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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:

1. Steel reinforcement
2. Cement
3. Coarse aggregate
4. 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. However, the construction work of the substation will be conducted throughout the year.

# CHAPTER-III

# Study Methodology

**3.1 General**

The methodology 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 generate relevant information for the SIA. The study team has maintained close contacts with the district level government relevant line agencies, 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, construction of 132 kV substations (New Hetauda Substation and New Bharatpur substation) and expansion of existing Hetauda substation as well as the area that will be impacted due to the construction and operation of the project.

The project area includes 10 VDCs and 2 municipalities of 2 districts including Makawanpur (8 VDCs and 1 municipality) and Chitwan (2 VDCs and 1 municipality). 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 and the area occupied by the substations are considered as the core project area. 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/municipalities 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), RAP 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 (DDC, CDO, DFO, DHO, DADO etc.) and representatives of local government bodies (VDC), NGOs, 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, non governmental organizations (NGOs), community based organizations (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-Dhalkebar-Duhabi 400 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 1 Supervisor and 5 local enumerators (2 male and 3 female) were locally hired for field study.

### *3.* 7 Sample Distribution

The RAP study has covered 8 VDCs and 2 municipalities of the 2 project affected districts. Altogether 10 PRAs, census of 147 affected households, 10 market surveys in 8 VDCs and 2 municipalities was conducted in the project area (Table 3.1).

**Table 3.1: Sample Distribution**

|  |  |  |  |
| --- | --- | --- | --- |
| **VDCs/Municipalities** | **Surveyed Households** | **Market Survey** | **PRA Meetings** |
| Hetauda Municipality | 7 | 1 | 1 |
| Basamadi | 27 | 1 | 1 |
| Manahari | 51 | 1 | 1 |
| Piple | 14 | 1 | 1 |
| Bhandara | 0 | 1 | 1 |
| Birendranagar | 20 | 1 | 1 |
| Chainpur | 18 | 1 | 1 |
| Jutpani | 6 | 1 | 1 |
| Saktikhor | 4 | 1 | 1 |
| **Bharatpur Municipality** | **0** | **1** | 1 |
| **Total** | **147** | **10** | **10** |

## 3. 8 Fieldwork

The fieldwork for SIA was started from March 30 to April 10, 2011 under the close supervision and guidance of the Sociologist /Resettlement Expert, Database Expert and Community Liaison Expert. 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, 174 households will be affected due to the implementation of the proposed project. Out of which of 147 households were surveyed to collect socio-economic baseline information. Twenty seven households were missing during field survey hence could not be enumerated. The households’ survey was carried out in 7 VDCs and 1 municipality of Makwanpur and Chitwan districts. The other VDCs and Municipalities where the transmission line passes through the forest area and no private land were affected in towers and RoW were not considered for the survey.

Census survey of 147 household (whose land and house will be acquired for tower pads and houses/structures to be acquired in ROW) 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. There are altogether 147 households affected by towers and structures falls in Row. Out of that 33 household will be affected by acquisition of land for tower pads and 114 households will be affected by acquisition of structures including cowshed.

## 3. 10 Participatory Rapid Appraisal

Altogether 10 Participatory rapid appraisals (PRAs) were conducted including one in each VDC/municipality affected by the project to collect basic socio economic data, 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 176 participants including 65 female representing different groups, former VDC Chairman, VDC Secretary, school teacher, businessmen, farmer, student, social workers and representatives of women organizations, NGOs, CBOs, political parties etc. had participated in the PRA. The average number of participants in each PRA was 18 persons. A checklist was developed to facilitate the PRA (Annex-II).

## 3.11 Market Survey

Market survey in the 8 project VDCs and 2 municipalities 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 (Annex-II).

## 3.12 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.

## 3.13 Data Encoding and Analysis

The field Supervisors was responsible to make sure that all the required information collected properly and consistent. Any missing or inconsistent information was collected or corrected 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. One Data Manager was responsible to develop data entry program, data cleaning/editing, managing the data entry process and processing data in Kathmandu. The Data Manager has worked in close coordination with the experts.

## 3.14 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.

## 3.15 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.

## 3.16 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/Hetauda- Bharatpur Project, NEA for land acquisition and compensation of affected households/assets.
* **Entitled Person:** Any person who is entitled to 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).

## 3.17 Team Composition

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

* Team Coordinator- Rabindra Chaudhary
* Resettlement & Rehabilitation Expert-Bhakti Timsina
* Community Dev. Expert- Devi P. Adhikari
* Socio-economist- Achut Dawadi
* Database Expert - Krishna Prasad Joshi

# CHAPTER-IV

# 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 Hetauda- Bharatpur 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 while implementing the project.

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 are 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) stated that discrimination shall not be conducted based on color, origin, caste and language. Article 13 (4) mentioned that equal wages shall be given to female for same kind of work. Article 19 (2) mentioned that that the state shall acquire legal private property only for public interest and Article 19 (3) mentioned that compensation shall be provided for such acquired property as prescribed by law. Article 35 (5) of the Interim Constitution mentioned about 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 any quantity by giving the compensation pursuant to the act for the 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 any body/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 classified 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 mentioned 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 restrict 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 man power 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.

### 4.2.3 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 88 states that any person or corporate body desiring to produce or transmit electricity shall submit an application requesting for the use of such land. However, such land, if regulated, should be compensated (Rule 87) as determined by the Compensation Fixation Committee. This rule is applicable for study as well as project construction.

#### 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 Labour 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 provides 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-V

# COMMUNITY CONSULTATION AND Grievance Redressal Mechanism

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.

## 5.1 Procedure for Consultation and Participation

Participatory Rural Appraisal (PRA) was used as main tool for community consultation and participation for the preparation of SIA. 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 households’ survey and 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**

|  |  |  |
| --- | --- | --- |
| **VDCs/Municipalities** | **Market Survey** | **PRA Meetings** |
| Hetauda Municipality | 1 | 1 |
| Basamadi | 1 | 1 |
| Manahari | 1 | 1 |
| Piple | 1 | 1 |
| Bhandara | 1 | 1 |
| Birendranagar | 1 | 1 |
| Chainpur | 1 | 1 |
| Jutpani | 1 | 1 |
| Saktikhor | 1 | 1 |
| Bharatpur Municipality | 1 | 1 |
| **Total** | **10** | **10** |

Altogether, 176 people participated in PRA meetings held in different project VDCs. Of the total participants 111 (63.07%) were male and 65 (36.93%) were female. Hill-Brahmin/Chhetri, Tamang, Chepang, Newar, Dalit, Gurung, Rai, Darai and Magar are the major caste/ethnic groups participated in 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**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **SN** | **Date of Public Meeting** | **Location of public meeting** | | | | **No. of Participant** | | | **Name of caste/ethnic group** |
| **AP section** | **District** | **VDC/wards** | **Village/Tole** | **Total** | **Male** | **Female** |
| 1 | 12/25/2067 | AP-18 to AP-18B/0 | Chitwan | Jutpani VDC-3 | Jutpani Bazaar | 27 | 22 | 5 | Magar, Brahmin/ Chhetri, Tamang/ Dalit, Newar |
| 2 | 12/25/2067 | Substation area | Chitwan | Bharatpur Municipality-11 | Kailash Tole | 9 | 8 | 1 | Brahmin/ Chhetri, Newar |
| 3 | 12/26/2067 | AP-18D/0 to AP 18/E | Chitwan | Saktikhor VDC-9 | Majhuwa Tole | 11 | 5 | 6 | Tamang, Magar, Dalit |
| 4 | 12/23/2067 | AP-15/1 to AP-15/2 | Chitwan | Birendranagar VDC-1 | Six Group, Gharedi Tole | 18 | 10 | 8 | Tamang, Dalit |
| 5 | 12/24/2067 | AP-17/10 to AP18/0 | Chitwan | Chainpur VDC-9 | Gaindahal | 22 | 12 | 10 | Gurung, Tamang, Dalit, Newar |
| 6 | 12/21/2067 | AP-9/2 to AP-10/0 | Makwanpur | Manahari VDC-3 | Chainpur road, Penche | 23 | 12 | 11 | Chepang, Tamang, Chhetri |
| 7 | 12/18/2067 | AP-2/1 to AP-2/2 | Chitwan | Basamadi VDC-3 | Magar Tole, Lewat | 20 | 11 | 9 | Magar, Tamang, Brahmin/Chhetri |
| 8 | 12/18/2067 | AP-0/1 to AP-0/2 | Makwanpur | Hetauda Municipality-1 | Bhairab Danda | 13 | 13 | 0 | Brahmin |
| 9 | 12/22/2067 | AP-13/3 to AP 13/4 | Chitwan | Piple VDC-6 | Raigaun | 18 | 8 | 10 | Rai |
| 10 | 12/22/2067 | AP-14/0 to AP-14/1 | Chitwan | Bhandara VDC-8 | Sundar Basti, Dhaduwa | 15 | 10 | 5 | Tamang, Chepang, Rai, Newar, Darai, Brahmin |
|  | **Total** |  |  |  |  | **176** | **111** | **65** |  |

During the consultation, the participants and the affected households were requested to express their problem, attitude and knowledge regarding the project. Similarly, information such as project purpose, project type, impact area, likely impacts and potential opportunities were given to the local people during the stakeholder consultation.

Household survey indicates that about 88.44% of surveyed households have positive attitude towards the implementation of the project while 2.04% is against the project’s implementation and 9.52% have shown neutrality. According to local people the region behind the support of the project is need of transmission line for regular supply of electricity and solves the problem of electricity crisis in the country.

Moreover, 3 households have suggested for shifting of transmission line alignment towards forest to reduce the project impacts on socio-economic and Cultural Environment.

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.

## *5.2 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 solve the problem of load shedding. 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 are summarized in Table-5.3.

**Table 5.3: Summery of Key Issues and Concerns**

|  |  |
| --- | --- |
| **Key Areas of Concerns** | **Details of Issues/Concerns** |
| **Compensation** | * Appropriate compensation for land and private property * Compensation of land/property should be as per the prevailing market rate. |
| **Livelihood** | * Employment to local people during the construction period * Devaluation of RoW land. * Most of families particularly in Basamadi and Manahari VDC are already displaced due to construction of Kulekhani I and II HEP and natural disasters occur in Kankada area. The implementations of the proposed project will again displace the affected families. Therefore, special resettlement package should be developed. |
| **Alignment of Transmission Line** | * Avoid settlements and market centers while selecting final route alignment (Note: local people suggested that AP-9/2 to AP-10/0 near Manahari Bazar, Manahari VDC of Makwanpur district should be fixed at least 500 m away from the market otherwise they will oppose the project). |
| **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, women empowerment program, income generation program should be launched by the project. |
| **Service facility** | * Electricity service should be regular and reliable * Free of cost electricity service to the project affected families |
| **Infrastructure** | * Public and private infrastructures should be protected during the construction of the project. * Protection of religious and cultural sites. * Avoid the infrastructures which fall in RoW. Radha Structures and Engineering Works (P) LTD is under construction industry, which is located at AP-4/9 to Ap4/10. The proprietor of the industry and local people requested that the proposed transmission line corridor should be shifted to the north at least more than 500 m away from the industry. * School compound of Shree Lower Secondary School located at Jutpani VDC ward no 3 of Chitwan district falls in RoW (Ap-18D/0 to AP-18/E). The school management committee requested to shift the transmission line more than 500 m away from the school compound. |
| **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 and Rehabilitation assistance is required for all the displaced people. |

## *5.3 Continuation of Consultation Process*

The major issues raised during consultation process will be addressed through different mechanism and support system to the affected people. Major areas of public concerns pertain to right amount of compensation for their 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.

## *5.4 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 committees specified i.e. local consultive forum and formal courts of appeal system. Under the latter system every PAP/Hhs can appeal to the court if they feel that they are not compensated appropriately. They may appeal to appellate court within 35 days of the public notice given to them.

Grievance recording register will be maintained at Hetauda-Bharatupur Environment and Social Management Unit (HB-ESMU) established at site. Project affected people as well as local people can lodge their complaints at HB-ESMU office related to assets acquisition and construction related activities.

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.

PAPs/Hhs and community will be exempted from all administrative fees incurred, pursuant to the grievance redressed procedures except for cases filed in court. Proposed mechanism for grievance resolution is given below:

**Step-1**

Complaints of PAPs/Hhs and community on any aspect of compensation, relocation, or unaddressed losses of private and community property will in first instance be settled verbally or in written form in field based project office on sites. The complaint can be discussed in an informal meeting with the PAPs/Hhs and project Land Acquisition and Rehabilitation Unit. The land Acquisition and Rehabilitation Officer will be responsible to handle the grievances at this stage. This Unit will be created within the Project Manager Office with vertical linkage with ESSD of NEA. The Unit will be solely responsible to be in close contact with all affected people and public and hear record and formally file their complaints in the registers on a regular basis. The Unit will make necessary inquiry and verification regarding the complain address the issue within 7 days of complain registered.

**Step-2**

If issue is not addressed within 7 days of written application to the satisfaction of PAPs/Hhs they can file formal type written complain to HB-ESMU. While lodging the complaint, the PAP/Hhs and community must produce documents to support their claim. The Social Development/ Resettlement Expert of the Unit will made field observation and discuss the issue with Project Manager through the Unit chief. If issue is still not resolve to the satisfaction of both the parties the issue will be discussed in Local Consultative Forums (LCFs).

The LCF will be coordinated by Social Development/ Resettlement Expert of the HB-ESMU and will be inclusive in nature. Former VDC chairman, VDC secretary, representatives PAF, female, Dalits, Janajati will be the member of the community. The LCF will play key roles in public consultations, grievance handling/ managing at local level, participate proactively in planning and implementation process and key decision making matters that contribute to better outcomes and performances, especially in RAP implementation.

The HBESMU will coordinate the meetings with LCF and will attempt to make a decision acceptable to all parties. The issue rather than compensation of the land and structure thus brought to LCF will be resolved within 15 days from the date of the complaint received. The issue related to compensation will be forwarded to CDC along with recommendation of LCF for further consideration on this issue. A joint meeting of the CDC and LCF will be conducted to discuss on this issue and a decision will be taken acceptable to both parties. The community liaison officer and Social Development/ Resettlement Expert will play active role to resolve the issues.

For the loss of private assets and compensation the affected household can lodge their complain directly to CDC. While lodging the complaint, the PAP/HH and community must produce documents to support their claim. The CDC will provide the decision within 15 days of registering the appeal.

**Step-3**

If the PAP/Hhs and local community are not satisfied with the decision of CDC/ LCF or in absence of any response of its representatives, within 35 days of the complaint, the PAP/Hhs and community may submit its case to the District Court for the issues related to acquisition and compensation. The decision of the court will be acceptable to both parties. Regarding the issues of implementation of social mitigation and enhancement programs, social impacts and other community development work agreed in project documents they can place application to line ministries (Ministry of Energy or Ministry of Environment). The Ministry may address the issues as per the Environment Protection Rules (clause 17), 1997.

**CHAPTER-VI**

**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 Hetauda-Bharatpur 220 kV Transmission Line Project is located in two districts namely Makwanpur and Chitwan of Narayani Zone of Central Development Region of Nepal. The project districts encompass 79 VDCs and 3 municipalities (43 VDCs and 1 Municipality in Makwanpur district & 36 VDCs and 2 municipalities in Chitwan district). According to the Statistical Bulletin, 2064 published by CBS, the total population of the project districts is 8, 64,652 with 4, 34,228 male and 4, 30,424 female. The population distribution between male and female is 50.22 percent and 49.78 percent respectively. The population figure indicates that the project affected districts represent 3.73% of the total population of the country. The average population density of two districts is 187.5 persons /sq. km. Similarly, there are 1, 63,975 households with an average household size 5.3. The average annual population growth rate of the two districts is 2.54% (between the census periods 1991 to 2001). The dependent population (below 15 years and 60+years) of Makwanpur and Chitwan district is 70.56% and 11.39% respectively.

**Table- 6.1: Demographic Characteristics** **the Project districts**

|  |  |  |  |
| --- | --- | --- | --- |
| **Descriptions** | **Makwanpur** | **Chitwan** | **Total/Average** |
| Total Population | 392604 | 472048 | 864652 |
| Male | 199144 | 235084 | 434228 |
| Female | 193460 | 236964 | 430424 |
| Total Numbers of Households | 71112 | 92863 | 163975 |
| Average Households Size | 5.52 | 5.08 | 5.3 |
| Population Density( Persons/ Sq. km) | 162 | 213 | 187.5 |
| Annual Population Growth Rate (%) | 2.22 | 2.86 | 2.54 |
| Sex Ratio(M/F) | 102.94 | 99.21 | 101.08 |
| Urban Population (%) | 17.44 | 26.93 | 22.19 |
| Population Below 15 Years (%) | 76.95 | 64.16 | 70.56 |
| Elderly Population 60+Years (%) | 11.6 | 11.18 | 11.39 |
| Literacy Rate (%) | 63.4 | 71.1 | 67.25 |
| Male Literacy Rate (%) | 72.72 | 79.3 | 76.01 |
| Female Literacy Rate (%) | 53.9 | 63 | 58.35 |
| Total area (sq. km) | 2426 | 2218 | 4644 |
| District Pop. Compared With Country's population | 1.7 | 2.04 | 1.87 |
| Total no of Municipalities | 1 | 2 | 3 |
| Total no of VDCs | 43 | 36 | 79 |

*Source: Statistical Bulletin CBS, 2064*

The average literacy rate of the project districts is 67.25% is higher than the National average (54.1%). According to Agricultural Profile of Makwanpur and Chitwan districts, the total area of the project districts is 4, 64,400 ha out of which 61.56% covered by forest, 23.24% by cultivated land, 5.13% by grazing land, and by 10.08% other land (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)** |
| Makwanpur | 242600 | 143473.6 | 61013.9 | 4924.78 | 33187.68 |
| Chitwan | 221800 | 142422 | 46894 | 18882 | 13602 |
| **Total** | **464400** | **285895.6** | **107907.9** | **23806.78** | **46789.68** |
| **Percentage** | **100** | **61.56** | **23.24** | **5.13** | **10.08** |

*Source: District Agricultural Profile 2065/066*

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

The proposed alignment traverses through ten VDCs and two municipalities of two districts of Central Development Region of Nepal (Table 6.3). The project affected VDCs and Municipalities are as follows:

**Table-6.3: List of project affected districts and VDCs**

|  |  |  |
| --- | --- | --- |
| **S.N.** | **District** | **VDC/Municipality** |
| 1 | Makwanpur | VDCs: Basamadi & Manahari |
| Municipality: Hetauda |
| 2 | Chitwan | VDCs: Piple, Bhandara, Birendranagar, Chainpur, Pithuwa, Jutpani, Shaktikhor, and Kabilas  Municipality: Bharatpur |

**6.2.1 Demography**

According to the National Population Census 2001, the total population of the project VDCs/Municipalities is 277257 with 140232 male (50.58 %) and 137025 (49.42%) female. This implies that the population of the project affected VDCs/Municipalities represent 32.07% of the total population of the project districts. The total number of households is 56795 with average household size 4.88 which is lower than the average household size of the project districts (5.3).. The average population density of the project VDCs/Municipalities is 648.99 (persons/sq. km), which is higher than the average population density 187.5 persons/sq.km) of the project districts.

**Table -6.4: Demographic Characteristics of the Project Affected VDCs/Municipalities**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **VDCs/Municipalities** | **Population** | | | **Area (Sq. km)** | **Households** | **Population Density**  (**Persons/ Sq .km)** | **Household Size** |
| **Total** | **Male** | **Female** |
| Hetauda Municipality | 68482 | 35320 | 33162 | 47.74 | 14271 | 1434.48 | 4.80 |
| Basamadi | 14170 | 7213 | 6957 | 74.11 | 2545 | 191.20 | 5.57 |
| Manahari | 13835 | 6986 | 6849 | 25.66 | 2620 | 539.17 | 5.28 |
| Piple | 13082 | 6597 | 6485 | 44.82 | 2454 | 291.88 | 5.33 |
| Bhandara | 14368 | 7136 | 7232.00 | 24.24 | 2578 | 592.74 | 5.57 |
| Birendranagar | 13270 | 6376 | 6894 | 17.26 | 2541 | 768.83 | 5.22 |
| Chainpur | 14511 | 7007 | 7504 | 15.38 | 2789 | 943.50 | 5.20 |
| Phithuwa | 10590 | 5003 | 5587 | 12.68 | 2155 | 835.17 | 4.91 |
| Jutpani | 12694 | 6239 | 6455 | 17.05 | 2557 | 744.52 | 4.96 |
| Shaktikhor | 7419 | 3732 | 3687 | 28.94 | 1378 | 256.36 | 5.38 |
| Kabilas | 5513 | 2765 | 2748 | 50.56 | 985 | 109.04 | 5.60 |
| Bharatpur Municipality | 89323 | 45858 | 43465 | 68.77 | 19922 | 1298.87 | 4.48 |
| **Total/Average** | **277257** | **140232** | **137025** | **427.21** | **56795** | **648.99** | **4.88** |
| **Percentage** | **100** | **50.58** | **49.42** | **-** | **-** | **-** | **-** |

*Source: CBS, 2002*

**6.2.2 Population Distribution by Age Groups**

The population below 15 years of age is 98845, which is 35.65% of the total population. Out of them 50096 are male and 50096are female. 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 by Age Groups**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **VDCs/**  **Municipalities** | **Population** | **Below 15 Years of age** | | | **15 to 60 Years of age** | | | **Above 60 Years of age** | | |
| **Total** | **Male** | **Female** | **Total** | **Male** | **Female** | **Total** | **Male** | **Female** |
| Hetauda Municipality | 68482 | 22846 | 11820 | 11026 | 41772 | 21549 | 20223 | 3864 | 1951 | 1913 |
| Basamadi | 14170 | 5852 | 2995 | 2857 | 7528 | 3824 | 3704 | 790 | 560 | 230 |
| Manahari | 13835 | 5906 | 3014 | 2892 | 7209 | 3599 | 3610 | 720 | 373 | 347 |
| Piple | 13082 | 5309 | 2775 | 2534 | 7003 | 3399 | 3604 | 770 | 423 | 347 |
| Bhandara | 14368 | 5558 | 2344 | 3214 | 7901 | 3843 | 4058 | 909 | 472 | 437 |
| Birendranagar | 13270 | 4865 | 2463 | 2402 | 7414 | 3427 | 3987 | 991 | 486 | 505 |
| Chainpur | 14511 | 5406 | 2699 | 2707 | 8050 | 3783 | 4267 | 1055 | 525 | 530 |
| Pithuwa | 10590 | 3927 | 1981 | 1946 | 5765 | 2572 | 3193 | 898 | 450 | 448 |
| Jutpani | 12694 | 4914 | 2540 | 2374 | 6867 | 3248 | 3619 | 913 | 451 | 462 |
| Shaktikhor | 7419 | 3120 | 1581 | 1539 | 3797 | 1889 | 1908 | 502 | 262 | 240 |
| Kabilas | 5513 | 2299 | 1142 | 1157 | 2829 | 1425 | 1404 | 385 | 198 | 187 |
| Bharatpur Municipality | 89323 | 28843 | 14742 | 14101 | 54907 | 28387 | 26520 | 5573 | 2729 | 2844 |
| **Total** | **277257** | **98845** | **50096** | **48749** | **161042** | **80945** | **80097** | **17370** | **8880** | **8490** |
| **Percentage** | **100** | **35.65** | **18.07** | **17.58** | **58.08** | **29.19** | **28.89** | **6.26** | **3.20** | **3.06** |

***Source: CBS, 2002***

**6.2.3 Settlements**

The transmission line passes through 42 settlements of 8 VDCs and 2 Municipalities (Table 6.6). These settlements are more or less close from the proposed transmission corridor. Houses are mostly thatched roofed (*Kachi*) together with slate particularly in the village areas. Pakki house (made up with reinforcement, cement and concrete) are also found in each settlement mostly in the market centers. The average distance of the settlements from the transmission line corridor is 111.70m.

**Table-6.6: Summary Profile of Project Affected Settlement**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S.N.** | **Name of Settlement** | **VDC/Ward N0.** | **District** | **Average distance from T/L (m)** |
| **Settlement along Transmission Line alignment** | | | | |
| 1 | Chauki Tole | Hetauda Municipality-1 | Makwanpur | 100 |
| 2 | Bhairab Danda | Hetauda Municipality-1 | Makwanpur | 100 |
| 3 | Simalthali | Basamadi VDC-5 | Makwanpur | 200 |
| 4 | Rai Tole | Basamadi VDC-5 | Makwanpur | 100 |
| 5 | Lewat | Basamadi VDC-3 | Makwanpur | 100 |
| 6 | Ratmate Danda | Basamadi VDC-3 | Makwanpur | 150 |
| 7 | Kuna Tole | Basamadi VDC-3 | Makwanpur | 75 |
| 8 | Khadi Damar | Basamadi VDC-3 | Makwanpur | 100 |
| 9 | Badkaule | Basamadi VDC-3 | Makwanpur | 125 |
| 10 | Newarpani | Basamadi VDC-1 | Makwanpur | 100 |
| 11 | Kharang | Manahari VDC-8 | Makwanpur | 65 |
| 12 | Jaising | Manahari VDC-8 | Makwanpur | 75 |
| 13 | Jyamire | Manahari VDC-7 | Makwanpur | 200 |
| 14 | Sukhaura | Manahari VDC-7 | Makwanpur | 100 |
| 15 | Manahari | Manahari VDC-3 | Makwanpur | 125 |
| 16 | Tyanche Tole | Manahari VDC-3 | Makwanpur | 40 |
| 17 | Gumba Danda | Manahari VDC-1 | Makwanpur | 50 |
| 18 | Chepang Tole | Manahari VDC-1 | Makwanpur | 75 |
| 19 | Mahadev Tar | Piple VDC-6 | Chitwan | 100 |
| 20 | Godawari Tole | Piple VDC-6 | Chitwan | 125 |
| 21 | Jhurjhure Tole | Piple VDC-9 | Chitwan | 100 |
| 22 | Dhanduwa Basti | Bhandara VDC-8 | Chitwan | 150 |
| 23 | Sundar Basti | Bhandara VDC-8 | Chitwan | 100 |
| 24 | Ghareti Danda, 6 Group | Birendra Nagar VDC-1 | Chitwan | 100 |
| 25 | Intabhatti, 6 Group | Birendra Nagar VDC-1 | Chitwan | 100 |
| 26 | Salghari, Sixth Group | Birendra Nagar VDC-1 | Chitwan | 200 |
| 27 | Parbat Basti, 3 Group | Birendra Nagar VDC-5 | Chitwan | 250 |
| 28 | Seetal Tole, 2 Group (Sukumbasi Tole) | Birendra Nagar VDC-8 | Chitwan | 100 |
| 29 | Seetal Tole, Ghimire Danda | Birendra Nagar VDC-8 | Chitwan | 100 |
| 30 | Ping Tole, One Group | Birendra Nagar VDC-8 | Chitwan | 50 |
| 31 | Gairabari Tole, One Group | Birendra Nagar VDC-8 | Chitwan | 50 |
| 32 | Amilipani | Birendra Nagar VDC-9 | Chitwan | 50 |
| 33 | Bangabar | Chainpur VDC-6 | Chitwan | 125 |
| 34 | Siddhipur | Chainpur VDC-6 | Chitwan | 125 |
| 35 | Ladari | Chainpur VDC-7 | Chitwan | 100 |
| 36 | Shaktikhor | Chainpur VDC-9 | Chitwan | 75 |
| 37 | Gaide Ahal | Chainpur VDC-9 | Chitwan | 50 |
| 38 | Majhuwa Tole | Shaktikhor VDC-9 | Chitwan | 300 |
| 39 | Jutpani | Jutpani VDC-3 | Chitwan | 150 |
| **Settlement nearby substation area** | | | |  |
| 40 | Thana Bharyang | Hetauda Municipality-11 | Makwanpur | 100m from substation |
| 41 | Sukumbasi Tole | Hetauda Municipality-11 | Makwanpur | 100m from substation |
| 42 | Aapntari | Bharatpur Municipality-2 | Chitwan | 300 m from proposed substation |

***Source: Field Survey***

**6.2.4 Population Composition by Caste/Ethnicity**

The project affected area is a heterogeneous composition of people of different origins, cultures, languages and ethnicities. Altogether 57 caste and ethnic groups are recorded in the project affected VDCs/municipalities (CBS 2002). The project area is dominated by Hill-Brahmin (32.56%) followed by Tamang (13.45%) and Chettri (13.40%). Similarly, caste/ethnic population like Newar (9.69%), Dalit (5.62%), Magar (4.68%), Gurung (4.71%), Tharu (2.46%), Chepang (2.37%), Rai (1.89%), Kumal (1.02%), Darai (0.91%), Muslim (0.91%), Danuwar (0.24%) and other (6.09%) are also residing in project area. The other category includes Haluwai, Barae, Gharti/Bhujel Nuniya, Kewat, Kayastha Sanyasi, Kalwar, Musahar, Hajam/Thakur, Dhobi, Sherpa/Bhote, and Dhanuk etc (Table 6.7). Further, Brahmins, Chettries, Newars etc have settled mostly in the terrain region where as Tamang, Gurung, Chepang, Rai, etc are residing in the foothill of Chure hill.

**Table-6.7: Population Distribution by Caste/Ethnicity**

|  |  |  |  |
| --- | --- | --- | --- |
| **S.N** | **Caste/Ethnicity** | **population** | **Percentage** |
| 1 | Brahamin,Hill/Terai | 90277 | 32.56 |
| 2 | Chettri | 37145 | 13.40 |
| 3 | Newar | 26874 | 9.69 |
| 4 | Tamang | 37298 | 13.45 |
| 5 | Magar | 12971 | 4.68 |
| 6 | Gurung | 13054 | 4.71 |
| 7 | Rai | 5245 | 1.89 |
| 8 | Chepang | 6574 | 2.37 |
| 9 | Darai | 2527 | 0.91 |
| 10 | Muslim | 2516 | 0.91 |
| 11 | Tharu | 6831 | 2.46 |
| 12 | Dalits | 15568 | 5.62 |
| 13 | Danuwar | 666 | 0.24 |
| 14 | Kumal | 2830 | 1.02 |
| 15 | Others | 16881 | 6.09 |
|  | **Total** | **277257** | **100.00** |

Source: CBS, 2002

Government of Nepal (GoN) has categorized 59 castes as indigenous and tribal group. About 41.43% of the total population of the project VDCs/Municipalities falls under the category of indigenous and tribal people (there is 12.95% indigenous and tribal people in the project affected districts). As per the classification made by GoN, the indigenous and tribal communities of the project affected area are Newar, Tamang, Rai, Magar, Gurung, Chepang, Darai, Danuwar, Tharu and Kumal.

**6.2.5 Population Composition by Religion**

Majority of the population in the project affected area belongs to Hinduism (80.16%) followed by Buddhism (17.69%), Islam (0.91%), Kirant (0.06%), Jain (0.01%), Christianity (1.05%), Sikha (0.01%) and Bahai (0.004%) are the other religions practiced by the people in the project area (Table 6.8).

**Table -6.8: Population Composition by Religion**

|  |  |  |  |
| --- | --- | --- | --- |
| **S.N** | **Religions** | **Population** | **Percentage** |
| 1 | Hindu | 222237 | 80.16 |
| 2 | Bouddha | 49044 | 17.69 |
| 3 | Islam | 2518 | 0.91 |
| 4 | Kirat | 176 | 0.06 |
| 5 | Jain | 24 | 0.01 |
| 6 | Christrain | 2899 | 1.05 |
| 7 | Sikha | 38 | 0.01 |
| 8 | Bahai | 11 | 0.004 |
| 9 | Not Stated | 310 | 0.11 |
|  | **Total** | **277257** | **100** |

Source: CBS, 2002

**6.2.6 Population Composition by Mother Tongue**

Nepali (73.67%) is the main language widely spoken by all people for communication in the project area (Table-6.8). Besides Nepali, the second most spoken language in the project affected VDCs/Municipalities is Tamang (10.65 %); followed by Newari (5.20%), Tharu (1.92 %), Gurung (1.87%), Magar(1.24%), Chepang(1.06%), Hindi(1.07%), Bhojpuri(0.81%), Maithali (0.66%)and others (1.86%). The other languages spoken by the people in the project area are Bote, Kumal, Darai, Sherpa, Urdu, Bantawa, Limbu, Awadhi, Thakali, Danuwar, Thulung and Marwari, etc.

**Table -6.9: Population Compositions by Mother Tongue**

|  |  |  |  |
| --- | --- | --- | --- |
| **S.N.** | **Languages** | **Population** | **Percentage** |
| 1 | Nepali | 204261 | 73.67 |
| 2 | Maitheli | 1824 | 0.66 |
| 3 | Bhojpuri | 2235 | 0.81 |
| 4 | Newar | 14406 | 5.2 |
| 5 | Tamang | 29525 | 10.65 |
| 6 | Gurung | 5178 | 1.87 |
| 7 | Magar | 3428 | 1.24 |
| 8 | Tharu | 5333 | 1.92 |
| 9 | Chepang | 2944 | 1.06 |
| 10 | Hindi | 2978 | 1.07 |
| 11 | Others | 5145 | 1.86 |
|  | **Total** | **277257** | **100** |

***Source: CBS, 2002***

### 6.2.7 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 Sherpa, Tamang, Gurung and Magar 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.

**6.2.8 Education and Literacy**

According to National population census 2001**,** the total population (6 years and above) of the project area is 242297 with male 50.40% and female 49.60%. Out of total, about 26.55% population can’t read and write, 4.98% can read only and 68.12% can read and write. According to CBS, the population (age 6 and more than 6 years), who can read and write is categorized as literate population. On this criterion the overall literacy rate of the project affected area is 68.12% (Table-6.10). Similarly, the male and female literacy rates are 77.08% and 59.02% respectively. Moreover, the average literacy rate of the project affected VDCs/Municipality is comparatively higher (68.12%) with the average literacy rate (67.25%) of the project districts.

**Table -6.10: Literacy Status of the Project Area (population of 6 years and above)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Descriptions** | **Male** | **Female** | **Both** | **Percentage** | **Literacy Status** | |
| Can't Read and Write | 21837 | 42496 | 64333 | 26.55 | **Male** | **Female** |
| Can Read only | 5678 | 6377 | 12055 | 4.98 |  |  |
| Can Read and Write | 94124 | 70926 | 165050 | **68.12** | **77.08** | **59.02** |
| Not Stead | 481 | 378 | 859 | 0.35 |  |  |
| **Total** | 122120 | 120177 | 242297 |  |  |  |
| **Percentage** | **50.40** | **49.60** | **100.00** |  |  |  |

*Source: CBS, 2002*

The female educational status is very lowdue to the various reasons like poverty, early marriage, school environment, additional work load in house, traditional belief, lack of awareness, and generally high illiteracy prevailing among Dalits and marginalized ethnic groups. However, it is relatively high among the other caste/ethnic groups like Brahmin, Chhetri, Newar, Yadav etc. mainly due to their better economic status and high level of awareness regarding education.

According to the National Population Census, 2001, the total population of children of schooling age (5-16 years) in the project area is 108787out of which 68.86% are enrolled in school. The male and female school enrolment status is 51.26% and 48.74% respectively.

The infrastructure development facility of most of the public schools in the project area is not satisfactory due to financial problems and poor management. The major problems of educational institutions in the project area are lack of physical facility, qualified and trained teachers, library facility, drinking water, and toilets facility and poor economic condition of the schools. However, some schools have better physical facilities due to own resource, active community participation, support from NGOs/INGOs and active role play of school management committee.

**6.2.9 Gender Status**

About 49.42% of the total population of the project area is women. The literacy status of women in the project area is low (59.02%) as compared with the male literacy status (77.08%).

Most of the women in the project area are engaged in the domestic works as well as labor in agriculture and other sectors. Cooking, washing, food processing, household maintenance, hygiene and sanitation activities, and taking care of the sick, elderly and other members of the family are daily activities of the woman in the project area. The school enrolment status of women is also low (48.74%) as compared with the school enrolment status of male (51.26%).

The major issues regarding women in the project VDCs/Municipalities are illiteracy, early marriage, domestic and sexual violence, sexual harassment, lack of reproductive right, gender discrimination and economic dependency. During the PRA meeting most of the participants said that there are no cultural/religious/social barriers for women of certain caste/ethnic groups in the project area. However, some barriers such as restriction on free movement and participation in social, political and religious gathering among the Muslim and Dalits communities are still unsolved. Some participants suggested for providing gender oriented education/training and creating mass awareness regarding gender equality to reduce the barriers.

There are some NGOs, INGOs and CBOs which are actively involved for the empowering of woman in the project area and working in the field of health, education, advocacy, and income generation activities. The activities of the NGOs, INGOs and CBOs are significantly contributing for social and economic empowerment of woman of the project area.

**6.2.10 Migration**

The movement of people from one defined place to another for various purposes like poverty, unemployment, low agricultural production and desire of improving quality of life are the main reasons for the migration in project area.

Due to presence of infrastructures, better facilities, fertile cultivated land the in-migration pattern from hilly area to terai and flat region is common practice in the project area. The out-migration specially the young generation migrate to neighboring country and abroad seeking for employment is also common. India, Malaysia, Qatar, Saudi Arabia and Dubai are the main destination in abroad to most of the migrants. Remittance is the prominent source of income for most landless, poor, and marginalized households of the project area. Migration has helped to improve socio-economic status of the local people of the project area and positive impact on local economy. Migration to the cities such as Hetauda, Bharatpur and Kathmandu, etc for various purposes like business, employment, study and medical services is also common in the project area.

Permanent in-migration is very rare but temporary out-migration for work is quite common. There are some precise statistics on labour migration. Outward migration is generally seasonal for the search of jobs in nearby towns like Bharatpur, Hetauda and Kathmandu with the aim of supplementing household income. A few households reported that members of their family migrate for educational purposes and service. In general male members of Brahmin and Chettry families go to nearby towns or Kathmandu to work as government employees, and the young men of Sherpa, Tamang, Gurung, and Magar families go abroad to join military, labour and other services, etc.

**6.2.11 Occupation and Employment**

Agricultural is the main occupation of people in the project area. About 73.87 % of the total households are engaged in the agricultural activities. The remaining 26.13% people are engaged in trade/business, service, labor, manufacturing, transportation and others fields (Table 6.11).

**Table -6.11: Occupational Composition of the Households in the project area**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **VDCs/Municipalities** | **HHs** | **Agricultural** | **Manufacturing** | **Trade/Business** | **Transport** | **Services** | **Others** |
| Hetauda Municipality | 14271 | 9875 | 165 | 2069 | 302 | 1202 | 658 |
| Basamadi | 2545 | 1655 | 30 | 144 | 92 | 422 | 202 |
| Manahari | 2620 | 1777 | 49 | 257 | 49 | 300 | 188 |
| Piple | 2454 | 1923 | 84 | 173 | 40 | 134 | 100 |
| Bhandara | 2578 | 1587 | 23 | 186 | 90 | 269 | 423 |
| Birendranagar | 2541 | 2049 | 32 | 146 | 11 | 225 | 78 |
| Chainpur | 2789 | 2417 | 25 | 99 | 32 | 216 | 0 |
| Pithuwa | 2155 | 1668 | 24 | 174 | 26 | 170 | 93 |
| Jutpani | 2557 | 1929 | 21 | 210 | 36 | 223 | 138 |
| Shaktikhor | 1378 | 1215 | 13 | 51 | 0 | 50 | 49 |
| Kabilas | 985 | 659 | 11 | 89 | 2 | 3 | 221 |
| Bharatpur Municipality | 19922 | 15200 | 273 | 2561 | 208 | 933 | 747 |
| **Total** | **56795** | **41954** | **750** | **6159** | **888** | **4147** | **2897** |
| **Percentage** | **100** | **73.87** | **1.32** | **10.84** | **1.56** | **7.30** | **5.10** |

Source: CBS, 2002

The field survey revealed that agriculture is the main source of livelihood for the people in the project area. However, in recent years, some young people go to foreign countries to work as labourers. The remittance is one of the major sources of income of the households in the project area.

**6.2.12 Income and Expenditure**

Agriculture, trade/business, services, wage and labor are the major income sources of the households in the project area. Animal husbandry and small scale industries are also additional income sources of the households. According to the District Agricultural Profile of concern districts, it is recorded that maximum average annual income of the households in the project area is calculated to be NRs 54,163.

As far as the project affected area it is concerned that the level and structure of consumption are more or less similar to the rural settings of the country. Most of the expenditures are for the consumption of food items as well as education, health, energy and other non-food items.

**6.2.13 Land Use and Average Holding Size**

Agricultural and forest land are the pre dominant form of land use in the project area. Other types of land use in the project area consist of grazing, residential/village, public lands and others such as *bagar* and barren land. Agricultural land is generally located along the river basin and its tributaries on relatively less steep slopes near the settlements. Forestland is primarily found on steep sloped hillsides.

Agricultural land in the project area is mainly of two types: *Khet* and *Bari*. The term *Khet* refers to the fields which have been terraced, leveled and bonded for cultivation of paddy by flood or irrigation. *Khet* is highly preferred by the local people because it is irrigated and usually yields three crops per annum. *Bari* (Non- irrigated land) is a rain fed land, usually terraced with an outward slope to ensure good drainage.

Besides *Khet* and *Bari*, there is another land use practice in the project area locally known as *Kharbari.* *Kharbar*i is a steep sloping land formed by clearing forest on which grass, bush and other vegetation are grown.

The total are of the project affected VDCs/Municipalities is calculated to be 36770 ha out of which 13242 ha (36.01% )is cultivated land .The land holding size of the project VDCs/Municipalities is 0.23ha/Hh which is lower than the average land holding (0.54ha/Hh) of the project districts (Table 6.12). The average land holding sizes of Makwanpur and Chitwan district are 0.58and 0.50 ha per household respectively (Districts Agricultural Profile, 2065/66 B.S.).

**Table - 6.12: Cultivated land and Average land holding Size in the project area**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **VDCs/Municipalities** | **Households** | **Total Area(ha)** | **Cultivated land(ha)** | **Percentage** | **Land Holding(ha/hh)** |
| Hetauda Municipality | 14271 | 4774 | 1545 | 32.36 | 0.33 |
| Basamadi | 2545 | 1471 | 790 | 53.70 | 0.58 |
| Manahari | 2620 | 2565 | 1170 | 45.61 | 0.98 |
| Piple | 2454 | 4482 | 1699 | 37.91 | 0.69 |
| Bhandara | 2578 | 2424 | 1155 | 47.65 | 0.45 |
| Birendranagar | 2541 | 1726 | 768 | 44.50 | 0.30 |
| Chainpur | 2789 | 1538 | 673 | 43.76 | 0.24 |
| Phituwa | 2155 | 1268 | 590 | 46.53 | 0.27 |
| Jutpani | 2557 | 1705 | 778 | 45.63 | 0.30 |
| Shaktikhor | 1378 | 2894 | 755 | 26.09 | 0.55 |
| Kabilas | 985 | 5046 | 1199 | 23.76 | 1.22 |
| Bharatpur Municipality | 19922 | 6877 | 2120 | 30.83 | 0.11 |
| **Total** | **56795** | **36770** | **13242** | **36.01** | **0.23** |

*Source: Agricultural Profile: 2065/066*

**6.2.14 Agricultural Production and Livestock Practice**

Paddy, Maize, wheat and millet are the major food crops grown in the project area. The cash crops grown in the project area are vegetables, potato, Lentil (Dal) and oil seeds. The average production of food crops like paddy, maize, wheat and millet is 2.74MT/ha, 2.57MT/ha, 2.11MT/ha, and 0.99MT/ha respectively. Similarly, the average production of crash crops like potato, oilseed, vegetable and lentil is 13.73MT/ha, 0.83MT/ha, 16.06/ha, and 1.32 MT/ha respectively (District Agricultural Development Office Profile, 2065/66).

Irrigation is the major problem of the farmers in the hilly section of the project area. Only 30.37% of the total cultivated land is irrigated in Makwanpur district while 63.64% in Chitwan district. Traditional *Kulo* is the means of irrigation in the hilly section of the proposed transmission line corridor. Similarly, irrigation canal, deep tube well, shallow tube well, and boring are the major irrigation facilities (Terai section) in project area. The hilly section of the project area is low cultivated land as compared with Terai section.

Goats, cows, bulls, buffaloes, sheep, pigs and poultry are the domesticated livestock found in the project area. These livestock are sold at the local market for supplementary income of the households.

About 14.44% households in project area have agricultural land, livestock and poultry where as 29.84% have agricultural land and livestock and 14.55% have agricultural land only. Similarly, 0.81% households have livestock and poultry, 3.18% have livestock only, 0.60% households have poultry only and 1.33% households have agricultural land and poultry (Table 6.13).

**Table - 6.13: Livestock Distributions in the project area**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **VDCs/**  **Municipalities** | **HHs** | **Agri. Only** | **Li. Only** | **Pou. Only** | **La. and Li.** | **La. and Pou.** | **Li. and Pou.** | **La, Li, and Pou.** | **Non of All** |
| Hetauda Municipality | 14271 | 2404 | 454 | 169 | 2676 | 249 | 131 | 659 | 7529 |
| Basamadi | 2545 | 271 | 65 | 20 | 697 | 48 | 52 | 1091 | 301 |
| Manahari | 2620 | 365 | 103 | 12 | 908 | 35 | 38 | 779 | 380 |
| Piple | 2454 | 403 | 64 | 3 | 1234 | 52 | 23 | 497 | 178 |
| Bhandara | 2578 | 446 | 67 | 12 | 1214 | 71 | 17 | 482 | 269 |
| Birendranagar | 2541 | 359 | 56 | 11 | 1205 | 26 | 22 | 690 | 172 |
| Chainpur | 2789 | 340 | 47 | 1 | 1221 | 30 | 26 | 916 | 208 |
| Pithuwa | 2155 | 183 | 38 | 19 | 1150 | 28 | 11 | 559 | 167 |
| Jutpani | 2557 | 439 | 54 | 9 | 1243 | 67 | 19 | 467 | 259 |
| Shaktikhor | 1378 | 107 | 7 | 2 | 282 | 20 | 8 | 891 | 61 |
| Kabilas | 985 | 86 | 35 | 1 | 211 | 12 | 10 | 501 | 129 |
| Bharatpur Municipality | 19922 | 2860 | 816 | 79 | 4905 | 115 | 101 | 672 | 10374 |
| **Total** | **56795** | **8263** | **1806** | **338** | **16946** | **753** | **458** | **8204** | **20027** |
| **Percentage** | **100** | **14.55** | **3.18** | **0.60** | **29.84** | **1.33** | **0.81** | **14.44** | **35.26** |

Source: CBS, 2002 Note: Agri= Agricultural land Only, Li= Livestock, pou=poultry

**6.2.15 Health and Sanitation**

Due to the various reasons like lack of proper drainage system, lack of health workers, etc., people of the project area face severe health problems. Despite the existence of health posts and sub-health posts in the project affected area, there is lack of health workers. The entire population depends upon the facilities available in the district headquarter in Hetauda and Bharatpur. Health posts and sub-health posts are available in each VDCs of the project area.

Open defecation along the river or in the open fields or in the forest area is also common practice in the project area. According to district sources about 73.95% households in project area are equipped with toilet facilities. But the level of awareness particularly towards the use of toilet is gradually increasing. The present sanitation facilities in the ten project affected VDCs and two municipalities appear to be not satisfactory.

Diarrhea, skin disease, acute respiratory infection, chronic bronchitis, gastritis, diabetes, abdominal pain, and eye ear problems, Cancer, Diabetes, Malnutrition, Tuberculoses, women Uterus problem and Paralysis are the common diseases reported from the project area. Medical shops are available in the market area like Hetauda, Manahari Bazar, Bhandara, Jutpani Bazar and Bharatpur (Chitwan) etc.

### 6.2.16 Source of Drinking Water

Hand pipe, well, piped water and tube wells are the major source of drinking water in Terai area whereas springs, and rivulets are used in hilly section of the transmission line corridor. According to district sources, about 83.35% households in the project area are benefited by improved drinking water supply. However, the hilly section of the proposed transmission line corridor particularly Bhairav Danda (Hetauda Municipality), Piple, Basamadi and Manahari VDC, there is a problem of drinking water supply where one public tap is used for fifteen households.

**6.2.17 Source of Energy**

Two municipalities (Hetauda and Bharatpur) are fully electrified where as remaining ten VDCs are partially electrified through the national grid. The rural electrification program has been gradually increasing in the remaining parts of the project area. According to district source, about 65.05% households of the project area are benefited by the electricity. Therefore, electricity, solar and Kerosene are the major sources of lighting in the project area.

Fuel wood is the main source of energy for cooking followed by kerosene and LPG gas. A few households also use biogas for cooking and lighting purpose.

**6.2.18 Livelihood**

Agriculture (73.87%) is the major source of livelihood for the people in the project area**.** Agriculture alone has been found not sufficient to maintain their livelihood and many of them are compelled to do labour work either in nearby cites or out side the country. Seasonal migration particularly to India or gulf countries is one of the major sources of livelihood for most of the landless and subsistence households of the project area. Besides, some households of the project area are also engaged in non-agricultural economic activities such as trade/business, cottage industry, forest based activities, jobs, transport and other sectors for their livelihoods.

**6.2.19 Natural Resources**

Forest, river and pond are the main natural resources found in the project area. There are mainly two types of forest in the project area i.e. community managed forest and national forest. The forest resources are mainly located in the northern parts of the project area. About 61.56% land in the project affected district is covered by the forest.

The community forests are managed by local people (CFUG) and national forest by the government. Most of the forest located near the settlements of the project VDCs are community forest and managed by CFUGs. Most of the households in the project area are dependent on forest for their livelihood. People collect fuelwood, fodder/grass, thatch, timber and other NTFP from the forest as well as graze livestock in the forest area.

The forest resources of the area are significantly contributing to the livilihood and economic development of the local people particularly to the marginal and landless households. These households are largely depended on forest for subsistence.

Similarly, most of the CFUGs are generating income from the forest and investing for forest management, infrastructure development (rural road construction, road improvement, school building etc) and school operation.

Major rivers of the project area like Rapti Khola,Manahari Khola, Lothar Khola and Jyamire Khola are located in the project area which are supported to provide irrigation facilities in the project area. Similarly, other small rivers are also exist in the project area from which people irrigate their fields during the rainy season.

The rivers of project area create flood problem during rainy season resulting loss of lives, livestock, crops and property annually. Similarly, the rivers (sand, gravel and stone) are important source for revenue generation for project Districts.

**6.2.20 Religious and Cultural Sites**

There are some small temples and shrines of Hindu gods and goddesses, Gumba and few churches important to the local people. The Sahid Park, Sauraha and Chitwan National Park are the major tourist attraction centers in Makwanpur and Chitwan district.

**Table - 6.14: Religious Sites in the Project area**

|  |  |  |
| --- | --- | --- |
| **S.N** | **Name of VDCs/Municipalities** | **Religious Sites** |
| 1 | Hetauda Municipality | Pathibhara Mandir, Punya Chetra, Puspamandal |
| 2 | Basamadi | Dakhchhinkali Mandir |
| 3 | Birendranagar | Bagdevi Mandir |
| 4 | Manahari | Church |
| 5 | Manahari (Mahadev Tar) | Gumba |
| 6 | Birendra Nagar | Nava Durga Mandir |
| 7 | Birendra Nagar | Baglung Kalika Mandir (Memorial temple) |

**6.2.21 Community Infrastructures and Facilities**

The East–West High way (Mahendra Rajmarg ) is the major road access in the project area since major section of the transmission line is aligned close to highway. The major settlement are linked with black topped and gravel road with highway and smaller settlements are accessible through earthen roads. Telecommunication facilities are available in all VDCs/Municipalities through landline and wireless technology (CDMA, mobile). Drinking water facility through pipe is partially available in the project area.

Physical infrastructure and facilities such as sub-health posts, schools, post office, are located in most of the VDCs/Municipalities of the project area. Most of the area (Ilaka) level government offices such as agriculture and livestock service centers, range post, Ilaka post office, primary health center (PSC) are also located in accessible locations of the project area. Similarly, some cooperatives and saving/credit groups are also practiced financial transactions in the VDCs. Hetauda is the district headquarters of Makawanpur and Bharatpur is the district headquarter of Chitwan district and has almost required physical infrastructure and facilities. The Manahari Bazar, Lother Bazar, Tandi, Jutpani Bazar are the emerging main market centers in the project area. These market centers are equipped with most of the required physical infrastructure and facilities regarding, health, education, drinking water, communication, electricity, financial institutions, etc.

**6.2.22 Industrial Activities**

There are several small and large scale industries in the project area. The Hetauda Industrial Estate is located in Hetauda Municipality where various small and large scale industries are operated. There are several small and large industries and cottage industries including cement factory, sugar mill, distillery, saw mill, agro-processing mills, furniture industries, poultry farms and workshops (grill, mechanical, electric/electronic, wilding, etc.) in the project area. Similarly, there are some business/petty business shops, hotel/lodge/ restaurant, tea shops, cinema halls and fuel stations etc. particularly in the market area like Hetadua, Tandi, and Bharatpur etc.

**6.2.23 Law and Order**

During the field survey, it was observed that law and order situation in the project area was fairly satisfactory. The District Police Office (Hetauda and Bharatpur) and Ilalka Police Office are maintaining the law and order situation in the area. The local traditional head (particularly in Tharu community) also plays as an important role in maintaining law and order situation in the rural parts of the project area.

**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 147 households of 2 districts of the project area.

**6.3.1 Demographic Information**

**6.3.1.1 Population and Households**

The total population of 147 surveyed households is 902 with male 459 and female 443. The percentage of male and female population of PAFs is 50.89 and 49.11 respectively (Table 6.15). The male population of PAFs is comparatively higher than the female population. Similarly, the average male and female sex ratio of PAFs is 1.036 and the average household size is 6.14. The average HH size of the surveyed Households is 6.14 persons higher than the average household size of the projected affected VDCs/Municipalities (4.88 ) and the project affected districts (5.3).

**Table - 6.15: Population and households of PAFs**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **VDC/Municipality** | **Population** | | | | **Households** | |
| **Male** | **Female** | **Total** | **Sex ratio** | **Total** | **Average HH size** |
| Hetauda Municipality | 25 | 21 | 46 | 1.19 | 7 | 6.57 |
| Basamadi | 94 | 80 | 174 | 1.175 | 27 | 6.44 |
| Manahari | 171 | 172 | 343 | 0.994 | 51 | 6.725 |
| Birendranagar | 58 | 66 | 124 | 0.86 | 20 | 6.2 |
| Chainpur | 41 | 41 | 82 | 1 | 18 | 4.57 |
| Jutpani | 18 | 9 | 27 | 2 | 6 | 4.5 |
| Piple | 39 | 40 | 79 | 0.975 | 14 | 5.64 |
| Shaktikhor | 13 | 14 | 27 | 0.93 | 4 | 6.75 |
| Total/Average | 459 | 443 | 902 | 1.036 | 147 | 6.14 |
| **Percentage** | **50.89** | **49.11** | **100.00** | **-** | **-** | - |

*Source: Household Survey, 2011*

***Family Structure***

Nuclear family system is commonly practiced in PAFs. The field study shows that among the surveyed households 65.99% are nuclear families and 34.01% are joint families (Table 6.16).

**Table- 6.16: Families Structure of the PAFs**

|  |  |  |  |
| --- | --- | --- | --- |
| **VDC/Municipality** | **Family Type** | | |
| **Nuclear** | **Joint** | **Total Households** |
| Hetauda Municipality | 3 | 4 | 7 |
| Basamadi | 14 | 13 | 27 |
| Manahari | 32 | 19 | 51 |
| Birendranagar | 14 | 6 | 20 |
| Chainpur | 15 | 3 | 18 |
| Jutpani | 6 | 0 | 6 |
| Piple | 10 | 4 | 14 |
| Shaktikhor | 3 | 1 | 4 |
| Total | 97 | 50 | 147 |
| **Percentage** | **65.99** | **34.01** | **100** |

*Source: Household Survey, 2011*

***Distribution of Population by Age Groups***

The surveyed population comprises 30.16% children (0-14 years), 62.42% people in the economically active category (15-59 years) and 7.43% aged people (above 60 years).The overall dependency ratio is 37.58% with child dependency ratio 30.16% and aged dependency 7.43% (Table 6.17).

**Table 6.17 Population Distributions of PAFs by Age Group**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **VDC/Municipality** | **Broad Age Group** | | | **Population** |
| **0-14 years** | **15-59 years** | **60 and above** |
| Hetauda Municipality | 12 | 30 | 4 | 46 |
| Basamadi | 41 | 120 | 13 | 174 |
| Manahari | 120 | 203 | 20 | 343 |
| Birendranagar | 39 | 72 | 13 | 124 |
| Chainpur | 19 | 55 | 8 | 82 |
| Jutpani | 5 | 20 | 2 | 27 |
| Piple | 31 | 43 | 5 | 79 |
| Shaktikhor | 5 | 20 | 2 | 27 |
| Total | 272 | 563 | 67 | 902 |
| **Percentage** | **30.16** | **62.42** | **7.43** | **100.00** |

*Source: Household Survey, 2011*

**6.3.1.2 Marital Status of PAFs**

Regarding marital status of the surveyed population, 50.44 % is married, 46.12% is unmarried, 3.22% is widow or widower and.0.22% is isolated population. The married population of the PAFs is higher as compared with the unmarried population (6.5).

**Table -6.18: Marital Status of PAFs**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **VDC/Municipality** | **Marital Status** | | | | **Total Population** |
| **Unmarried** | **Married** | **Widow/Widower** | **Separated** |
| Hetauda Municipality | 24 | 22 | 0 | 0 | 46 |
| Basamadi | 74 | 97 | 3 | 0 | 174 |
| Manahari | 164 | 176 | 3 | 0 | 343 |
| Birendranagar | 52 | 63 | 8 | 1 | 124 |
| Chainpur | 40 | 35 | 7 | 0 | 82 |
| Jutpani | 10 | 14 | 2 | 1 | 27 |
| Piple | 40 | 35 | 4 | 0 | 79 |
| Shaktikhor | 12 | 13 | 2 | 0 | 27 |
| Total | 416 | 455 | 29 | 2 | 902 |
| **Percentage** | **46.12** | **50.44** | **3.22** | **0.22** | **100** |

*Source: Household Survey, 2011*

**6.3.1.3 Education and Literacy**

Of the surveyed population aged six years and above, nearly 21.1% is illiterate. The gender gap in literacy is wide. The illiteracy among women is 29.3% whereas the illiteracy among men 13.4% (Table 6.19). The average literacy rate of the project affected families is higher (78.9%), compared to the average literacy rate of the project affected VDCs/Municipality (67.98%) and the project districts (67.25%).

**Table- 6.19: Literacy Status of the PAFs**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Literacy Status** | **Male** | | **Female** | | **Total** | |
| No. | % | No. | % | No. | % |
| Illiterate | 56 | 13.4 | 117 | 29.3 | 173 | 21.1 |
| Literate | 362 | 86.6 | 283 | 70.7 | 645 | 78.9 |
| Total | 418 | 100 | 400 | 100 | 818 | 100 |
| **Percentage** | **51.10** | | **48.90** | | **100** | |

*Source: Household Survey, 2011*

***Educational Attainment***

Educational attainment among the 645 people recorded as literate is not satisfactory, with about 17.7% having no formal education and a further 35.7% achieving a primary level education only. Of the literate population, 7.5% had passed the School Leaving Certificate (SLC) and nearly 6.2% the intermediate level; and 2.8% had a bachelor’s or higher degree (Table- 6.20). The educational status of the project affected population is satisfactorily as compared with the educational status of the project affected VDCs/Municipalities.

**Table -6.20: Educational Attainments among the Literate Population of the PAFs**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Educational Attainment** | **Male** | | **Female** | | **Total** | |
| **No.** | **%** | **No.** | **%** | **No.** | **%** |
| Literate only | 60 | 16.6 | 54 | 19.1 | 114 | 17.7 |
| Primary Level | 115 | 31.8 | 115 | 40.6 | 230 | 35.7 |
| Lower Secondary | 86 | 23.8 | 56 | 19.8 | 142 | 22 |
| Secondary | 28 | 7.7 | 24 | 8.5 | 52 | 8.1 |
| SLC | 37 | 10.2 | 12 | 4.2 | 49 | 7.5 |
| Intermediate | 24 | 6.6 | 16 | 5.7 | 40 | 6.2 |
| Bachelors and above | 12 | 3.3 | 6 | 2.1 | 18 | 2.8 |
| **Total** | **362** | **100** | **283** | **100** | **645** | **100** |

*Source: Household Survey, 2011*

**6.3.1.4 Caste/Ethnicity**

The project area is diverse in caste/ethnicity. Of the surveyed households, about 39.46% households are Tamang (Marginalized Groups), 21.09% Brahamin/Chettri, 21.09% Disadvantaged Groups (Gurung, Magar and Rai), 6.12% Highly Marginalized (Chepang), (6.12%) are Newar, (7.48%) are Dalits (Kami, Damai and Sarki). About 71.43% 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 Newar, Magar, Gurung, Rai, Chepang and Tamang etc (Table 6.21).

Table- 6. 21: Caste/Ethnic Composition of the Surveyed Households

|  |  |  |
| --- | --- | --- |
| **Caste/Ethnic Group** | **No. of Household** | **Percentage** |
| **Highly Marginalized**   * Chepang(Manahari -7 HHs,   Birendranagar-1 HHs,Piple-1)  **Marginalized**   * Tamang(Hetauda-1HHs, Basamadi-10,Manahari-38HHs,Birendranagar-7HHs,Chainpur-1HHs,Shaktikhor-1HHs)   **Disadvantaged**   * Gurung,Magar and Rai(Hetauda-1,Basamadi-1,Birendranagar-5,Chainpur-7,Jutpani-5,Piple-10,Shaktikhor-2)   **Advanced**   * Newar(Basamadi-3,Birendranagar--1,Chainpur-3) | 9  58  31  7 | 6.12  39.46  21.09  4.76 |
| **Total Indigenous and Tribal** | 105 | 71.43 |
| **Brahmin/Chhetri**(Hetauda -4,Basamadi-13,Manahari-6,Birendranagar-4,Chainpur-2,Jutpani-1,Piple-1) | 31 | 21.09 |
| **Dalits**(HetaudaMunicipality- 1,  Birendranagar-2,Chainpur-5,Shaktikhor-1,Piple-2) | 11 | 7.48 |
| **Total** | **147** | **100** |

*Source: http://nefin.org.np/indigenous-nationalities/categorization.html for Indigenous Category and*

*Household Survey, 2011*

* + - 1. **Religion**

According to household survey, Hinduism (57.14%) is the dominant religion among the surveyed households. The other religions are Buddhism (36.05%), Christian (5.44%) and Islam (1.36%) practiced by the PAFs.

Table 6.22: Distribution of Surveyed Households by Religion

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **VDC/Municipality** | **Religion** | | | | | | | | **Total Households** |
| **Hindu** | | **Buddhism** | | **Islam** | | **Christian** | |
| No. | % | No. | % | No. | % | No. | % |
| Hetauda Municipality | 5 | 71.4 | - | - | 1 | 14.3 | 1 | 14.3 | 7 |
| Basamadi | 20 | 74.1 | 7 | 25.9 | - | - | - | - | 27 |
| Manahari | 15 | 29.4 | 31 | 60.8 | 1 | 2 | 4 | 7.8 | 51 |
| Birendranagar | 12 | 60 | 6 | 30 | - | - | 2 | 10 | 20 |
| Chainpur | 14 | 77.8 | 3 | 16.7 | - | - | 1 | 5.5 | 18 |
| Jutpani | 2 | 33.3 | 4 | 66.67 | - | - | - | - | 6 |
| Piple | 14 | 100 | - | - | - | - | - | - | 14 |
| Shaktikhor | 2 | 50 | 2 | 50 | - | - | - | - | 4 |
| **Total** | **84** | **57.1** | **53** | **36.1** | **2** | **1.4** | **8** | **5.4** | **147** |
| **Percentage** | **57.14** | | **36.05** | | **1.36** | | **5.44** | | **100** |

*Source: Household Survey, 2011*

**6.3.1.6 Language**

Nepali (67.35%), Tamang (25.17%), Chepang (2.72%) and Gurung (2.04%) are the major language spoken by PAFs. Among these languages,Nepali is widely (67.35%) spoken for communication among the PAFs (Table 6.23).

Table -6.23: Distribution of Surveyed Households by Spoken Language

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **VDC/Municipality** | **Language** | | | | | | | | | | **Total Households** |
|  | | | | | | | | | |  |
| **Nepali** | | **Tamang** | | **Chepang** | | **Gurung** | | **Magar** | | **-** |
| **No.** | **%** | **No.** | **%** | **No.** | **%** | **No.** | **%** | **No.** | **%** | **-** |
| Hetauda Municipality | 7 | 100 | - | - | - | - | - | - | - | - | 7 |
| Basamadi | 20 | 74.1 | 7 | 25.9 | - | - | - | - | - | - | 27 |
| Manahari | 21 | 41.2 | 26 | 51 | 4 | 7.8 | - | - | - | - | 51 |
| Birendranagar | 15 | 75 | 2 | 10 | - | - | 3 | 15 | - | - | 20 |
| Chainpur | 17 | 94.4 | 1 | 5.6 | - | - | - | - | - | - | 18 |
| Jutpani | 3 | 50 | - | - | - | - | - | - | 3 | 50 | 6 |
| Piple | 14 | 100 | - | - | - | - | - | - | - | - | 14 |
| Shaktikhor | 2 | 50 | 1 | 25 | - | - | - | - | 1 | 25 | 4 |
| **Total** | **99** | **67.35** | **37** | **25.17** | **4** | **2.72** | **3** | **2.04** | **4** | **2.72** | **147** |

*Source: Household Survey, 2011*

6.3.1.7 Migration

The project area is dominated by migrants and 80.27 % (118) households are migrant population. The major migration occurs from within and the neighboring districts covering 47.5 %, 17.8% and 19.5% from Makwanpur, Chitwan and Dhading districts respectively. Brahamin, Chettri, Newar, Magar, Rai, Gurung, Chepang, and Damai are the major caste/ethnic group of migrated population. Displacement from the Kulekhani Hydropower Project, Natural disasters, education, business/trade, job and physical facilities are the major reasons of migration in the project area.

Of the surveyed households, the migrant households have been in their current place of residence for various durations. Of the 118 migrant households, 11.02% migrated to the current place of residence since the last five years, 25.42% migrated before 5 to 10 years and 43.22% migrated before 10 to 20 years and 20.34% households have been living in the current place of residence since more than 20 years.

Of the surveyed households, 27.21% households reported their family members are absent at the time of survey. Of the total population, 6.10% was absentee population including 38.18% internal absentee population and 61.82% external absentee population.

**Table 6.24: Migration Status of Households**

|  |  |  |  |
| --- | --- | --- | --- |
| **VDC/Municipality** | **Migration Status of Households** | | |
| **Native** | **Migrant** | **Total Households** |
| Hetauda Municipality | 4 | 3 | 7 |
| Basamadi | 11 | 16 | 27 |
| Manahari | 1 | 50 | 51 |
| Birendranagar | 5 | 15 | 20 |
| Chainpur | 6 | 12 | 18 |
| Jutpani | - | 6 | 6 |
| Piple | 2 | 12 | 14 |
| Shaktikhor | - | 4 | 4 |
| Total | 29 | 118 | 147 |
| **Percentage** | **19.73** | **80.27** | **100** |

*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 30.3% of the economically active population, followed by service (6.5%), wage employment (25%), business and small industry (3.6%). Nearly 15.9% of the economically active population is students and 17.9% of the economically active population is engaged in household work (Table 6.25). The economically active male population is comparatively higher (50.52%) as compared with female economically active population (49.48%).

Table- 6.25: Occupational Composition of Surveyed Population (14 to 59 years)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Main Occupation | Male | | Female | | Total No | |
| No. | % | No. | % | No. | % |
| Agriculture | 82 | 28.1 | 94 | 32.9 | 176 | 30.3 |
| Animal Husbandry | - | - | 4 | 1.4 | 4 | 0.8 |
| Business and Small Industry | 12 | 4.1 | 9 | 3.1 | 21 | 3.6 |
| Household Works | 6 | 2 | 98 | 34.1 | 104 | 17.9 |
| Student | 50 | 17.1 | 42 | 14.6 | 92 | 15.9 |
| Labor(In country) | 90 | 30.7 | 31 | 10.8 | 121 | 20.9 |
| Labor(Outside Country) | 23 | 7.8 | 1 | 0.3 | 24 | 4.1 |
| Service(In Country) | 22 | 7.5 | 6 | 2.1 | 28 | 4.8 |
| Service(Other Country) | 8 | 2.7 | 2 | 0.7 | 10 | 1.7 |
| Total | 293 | 100 | 287 | 100 | 580 | 100 |
| **Percentage** | **50.52** | | **49.48** | | **100** | |

*Source: Household Survey, 2011*

**6.3.2.2 Business and Cottage Industry**

According to household survey it is recorded that, only 9.25%(14) households are engaged in business and cottage industry out of which 57.14% households areengaged ingrocery shop**,** 7.14**%** are engaged in workshop and35.71**%** are engaged in cottage industry**.** Theaverage monthly incomes of grocery shop, cottage industry and workshop are Rs.4500, Rs.7000 and Rs.14000 respectively.

6.3.2.3 Ownership of House, Valuable Household Assets and Infrastructures

Household survey indicates that 98.64% of the surveyed households are living in their own house and remaining (1.36%) are living in rented house and their relatives.

Field study reveals that most of the houses of the project affected people are made of mud and stone bricks (36.73%), cement and bricks (21.77%) and wooden wall (3.40%). Regarding for the roof type of the surveyed houses, about 55.78% are made with zinc plates, 21.09% are thatched, 13.61% are slate tiles and 9.52% are RCC. Of the houses about 61.90 % (91) are one story’s, 34.69 % (51) are two storied and 3.40 % (5) houses are three storied.

**Table- 6.26 Houses by Type of Wall**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| VDC/Municipality | **Wall Type** | | | | | **Total** |
| **Cement and Brick** | **Mud and Stone Brick** | **Wooden Wall** | **Bamboo Wall** | **Hollow wall** |  |
| Hetauda Municipality | 3 | 2 | 1 | - | 1 | 7 |
| Basamadi | 14 | 9 | 3 | - | 1 | 27 |
| Manahari | 20 | 12 | 16 | - | 3 | 51 |
| Birendranagar | 6 | 10 | 4 | - | - | 20 |
| Chainpur | 2 | 12 | 4 | - | - | 18 |
| Jutpani | 2 | 2 | 2 | - | - | 6 |
| Piple | 5 | 5 | 2 | 2 | - | 14 |
| Shaktikhor | 2 | 2 | - | - | - | 4 |
| Total | 54 | 54 | 32 | 2 | 5 | 147 |
| **Percentage** | **36.73** | **36.73** | **21.77** | **1.36** | **3.40** | **100** |

*Source: Household Survey, 2011*

Bicycle, mobile phone, radio, CD/DVD cassette player and television are the most common assets owned by the PAFs. According to the households survey, 26.5% households have own bicycle, 87.1% own mobile phone, 61.9% own cupboard, 42.2% own television and 32.7% surveyed households have own CD/DVD player. Similarly, a few of Surveyed households of the core project area have also own valuable assets such as motorcycle/scooter, Freeze /freezer, Computer/printer, Telephone and Camera etc. (Table- 6.27).

Table- 6.27: Percentage of Households Having Household Assets

|  |  |  |  |
| --- | --- | --- | --- |
| **Assets** | **Ownership** | | **No. of HHs** |
| **Yes** | **No** |
| Telephone | 8.2 | 91.8 | 12 |
| Mobile phone | 87.1 | 12.9 | 128 |
| DVD/Cassette Player | 32.7 | 67.3 | 48 |
| Television | 42.2 | 57.8 | 62 |
| Computer/Printer | 2.7 | 97.3 | 4 |
| Bicycle | 26.5 | 73.5 | 39 |
| Motorcycle/Scooter | 3.4 | 96.6 | 5 |
| Freeze/Freezer | 4.1 | 95.9 | 6 |
| Cupboard | 61.9 | 38.1 | 91 |
| Radio | 59.2 | 30.8 | 87 |
| Camera | 14.3 | 85.7 | 21 |

*Source: Household Survey, 2011*

**6.3.2.4 Food Security**

The project area is food deficit area due to the lack of the irrigation facilities and low fertile cultivated land. Only 26.53% of the surveyed households could grow enough food for their consumption in a year (Table 6.28).

**Table - 6.28: Food Sufficiency Status of PAFs**

|  |  |  |  |
| --- | --- | --- | --- |
| **VDC/Municipality** | **Sufficiency** | | |
| **Yes** | **No** | **Households** |
| Hetauda Municipality | 2 | 5 | 7 |
| Basamadi | 8 | 19 | 27 |
| Manahari | 6 | 45 | 51 |
| Birendranagar | 8 | 12 | 20 |
| Chainpur | 8 | 10 | 18 |
| Jutpani | 3 | 3 | 6 |
| Piple | 2 | 12 | 14 |
| Shaktikhor | 2 | 2 | 4 |
| Total | 39 | 108 | 147 |
| **percentage** | **26.53** | **73.47** | **100.00** |

*Source: Household Survey, 2011*

Of the surveyed households, about 33.33% reported food deficiency of 6-9 months, 39.81% for more than 9 months. Similarly, about 26.85% reported food shortage for less than 5 months (Table 6.29).

**Table -6.29: Food Deficiencies of the Surveyed Households**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **VDC/Municipality** | **Food Deficit Months** | | | | |
| **< 3** | **3-5** | **6 – 9** | **> 9** | **Households** |
| Hetauda Municipality | - | 2 | 2 | 1 | 5 |
| Basamadi | 2 | 8 | 7 | 2 | 19 |
| Manahari | - | 10 | 12 | 23 | 45 |
| Birendranagar | 1 | 3 | 6 | 2 | 12 |
| Chainpur | 1 | - | 4 | 5 | 10 |
| Jutpani | - | 1 | 1 | 1 | 3 |
| Piple | - | - | 4 | 8 | 12 |
| Shaktikhor | - | 1 | - | 1 | 2 |
| Total | 4 | 25 | 36 | 43 | 108 |
| Percentage | **3.70** | **23.15** | **33.33** | **39.81** | **100** |

*Source: Household Survey, 2011*

***Strategy for the fulfilment of the food deficiency period***

Of the surveyed households, 78.70% work as wage labor, 2.78% take loan and about 2.78 % depend on income of business to cope their food deficiency. Similarly, 0.93% 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 6.30).

Table -6.30: Strategy of the Surveyed Households to Cope with Food Deficiency Period

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **VDC/ Municipality** | **Strategies** | | | | | | |  |
| **Daily Wage** | **Remittance** | **Service** | **Business** | **Loan** | **Pension** | **Selling HHs Goods** | **Total** |
| Heatauda Municipality | 4 | 1 | - | - | - | - | - | 5 |
| Basamadi | 12 | 4 | 3 | - | - | - | - | 19 |
| Manahari | 40 | 1 | 1 | 1 | 1 | 1 | - | 45 |
| Birendranagar | 7 | 2 | - | - | 1 | 1 | 1 | 12 |
| Chainpur | 10 | - | - | - | - | - | - | 10 |
| Jutpani | 2 | - | 1 | - | - | - | - | 3 |
| Piple | 8 | - | 1 | 2 | 1 | - | - | 12 |
| Shaktikhor | 2 | - | - | - | - | - | - | 2 |
| Total | 85 | 8 | 6 | 3 | 3 | 2 | 1 | 108 |
| **Percentage** | **78.70** | **7.41** | **5.56** | **2.78** | **2.78** | **1.85** | **0.93** | **100** |

*Source: Household Survey, 2011*

**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 49.66% (73) households have family debt for various purposes (Table- 6.31).

**Table- 6.31: Debt Status of the Surveyed Households**

|  |  |  |  |
| --- | --- | --- | --- |
| **VDC/Municipality** | **Debt Status** | | |
| **Yes** | **No** | **Total No. of HHs** |
| Hetauda Municipality | 3 | 4 | 7 |
| Basamadi | 16 | 11 | 27 |
| Manahari | 25 | 26 | 51 |
| Birendranagar | 10 | 10 | 20 |
| Chainpur | 9 | 9 | 18 |
| Jutpani | 2 | 4 | 6 |
| Piple | 7 | 7 | 14 |
| Shaktikhor | 1 | 3 | 4 |
| Total | 73 | 74 | 147 |
| **Percentage** | **49.66** | **50.34** | **100** |

*Source: Household Survey, 2011*

Of the households who have taken loan, 17.81% have taken it for food and clothing, 8.22% have taken for education of their children and 24.66% for house maintenance. The other reasons for taking loan are purchase of land, business and migration (Table -6.32).

**Table- 6.32: Reason for taking loan by the surveyed households**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **VDC/Municipality** | **Reason** | | | | | | | |
|  | **Medicine** | **Buy Land** | **Education** | **House Maintenance** | **Business** | **Food/ Cloths** | **Migration** | ***Total*** |
| Hetauda Municipality | 1 | 1 | 1 | - | - | - | - | 3 |
| Basamadi | 3 | 1 | - | 3 | 5 | 3 | 1 | 16 |
| Manahari | 3 | 6 | 2 | 6 | 2 | 5 | 1 | 25 |
| Birendranagar | 2 | - | 1 | 3 | - | 2 | 2 | 10 |
| Chainpur | 2 | - | 2 | 2 | 2 | 1 | - | 9 |
| Jutpani | - | - | - | 1 | - | 1 | - | 2 |
| Piple | 1 | - | - | 2 | - | 1 | 3 | 7 |
| Shaktikhor | - | - | - | 1 | - | - | - | 1 |
| Total | 12 | 8 | 6 | 18 | 9 | 13 | 7 | 73 |
| **Percentage** | **16.44** | **10.96** | **8.22** | **24.66** | **12.33** | **17.81** | **9.59** | **100.00** |

*Source: Household Survey, 2011*

6.3.2.5 Income Source, Annual Income and Expenditure of PAFs

***Average Annual Income***

The weighted average annual income of surveyed households is NRs 155, 981. The contribution of off-farm is 88.29%, agriculture 8 % and livestock 3.71% to the total household income (Table- 6.33). 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 (Bridha Bhatta).

**Table - 6.33: Annual Average Incomes of PAFs**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **VDC/Municipality** | **Annual Average Income from different Sources** | | | | | | | |
| **Agriculture** | | **Livestock** | | **Non-Agriculture** | | **Total** | |
| NRs | % | NRs | % | NRs | % | NRs | % |
| Hetauda Municipality | 17,125 | 9.1 | 8214 | 4.4 | 1,62,241 | 86.5 | 1,87,580 | 100 |
| Basamadi | 20,124 | 11.9 | 6,344 | 3.8 | 1,41,900 | 84.3 | 1,68,368 | 100 |
| Manahari | 11,142 | 7.1 | 4,812 | 3.1 | 1,40,315 | 89.8 | 1,56,269 | 100 |
| Birendranagar | 10,228 | 7 | 8,314 | 5.7 | 1,27,312 | 87.3 | 1,45,854 | 100 |
| Chainpur | 8,817 | 6.3 | 6,048 | 4.3 | 1,25,942 | 89.4 | 1,40,807 | 100 |
| Jutpani | 18,156 | 10.8 | 4,217 | 2.5 | 1,45,319 | 86.7 | 1,67,692 | 100 |
| Piple | 8,078 | 6.1 | 3,548 | 2.6 | 1,22,316 | 91.3 | 1,33,942 | 100 |
| Shaktikhor | 6,112 | 4.1 | 4,910 | 3.3 | 1,36,315 | 92.6 | 1,47,337 | 100 |
| Average | 12473 | | 5801 | | 1,37,708 | | 1,55,981 | |
| **Percentage** | **8.00** | | **3.71** | | **88.29** | | **100** | |

*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 (33.9%) is the predominant income source of PAFs (Table- 6.34). Similarly, the other important income sources of the surveyed households are service (18.2%), daily wages (28%) and agriculture (8%).

**Table- 6.34: Income sources of PAFs**

|  |  |  |
| --- | --- | --- |
| **Income Sources** | **Average Income(Rs.)** | **%** |
| Agriculture Income(Net income from Cereals and Cash Crop products) | 12,473 | 8 |
| Animal Husbandry(Sale of Animals, Milk and Milk Products) | 5,801 | 3.7 |
| Service | 28,344 | 18.2 |
| Daily Wages/Porter | 43,732 | 28 |
| Pension and Briddha Bhatta | 2,978 | 1.9 |
| Business | 5,743 | 3.7 |
| Cottage Industry | 4,024 | 2.6 |
| Remittance | 43,886 | 33.9 |
| **Total Average Income** | **1,55,981** | **100** |

*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, 24,427. Food items form the largest expense category, accounting for 45.58% of total reported expenditure. The expenses of non food items like clothing, education, medicine, festivals, fuel, transportation and water/electricity are 11.05%, 13.63%, 6.21%, 13.44%, 5.02%, 3.68% and 1.32%respectively.

Table -6.35: Average Annual Expenditure of the PAFs

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **VDC/**  **Municipality** | **Expenditure Heading (%)** | | | | | | | | |
| **Food** | **Clothing** | **Education** | **Medicine** | **Festival** | **Fuel** | **Water/** | **Trans.** | **Avg/Exp (Rs.)** |
| **Items** | **Electricity** |
| Hetauda Municipality | 47.72 | 12.12 | 8.56 | 8.14 | 15.42 | 4.61 | 1.12 | 2.31 | 1,31,442 |
| Basamadi | 49.79 | 8.64 | 12.15 | 6.35 | 9.47 | 8.42 | 1.23 | 3.95 | 1,24,217 |
| Manahari | 46.89 | 9.91 | 13.24 | 5.52 | 13.52 | 5.16 | 1.81 | 3.23 | 1,18,715 |
| Birendranagar | 45.78 | 10.65 | 15.73 | 3.95 | 13.48 | 4.95 | 1.92 | 3.54 | 1,15,545 |
| Chainpur | 48.36 | 13.31 | 16.14 | 6.87 | 8.71 | 3.46 | 1.38 | 1.77 | 1,27,416 |
| Jutpani | 40.93 | 11.47 | 12.85 | 8.14 | 16.93 | 2.71 | 1.12 | 5.85 | 135,916 |
| Piple | 38.48 | 10.42 | 16.13 | 8.53 | 14.02 | 5.41 | 1.53 | 5.48 | 123,256 |
| Shaktikhor | 46.67 | 11.91 | 14.2 | 2.16 | 15.93 | 5.41 | 0.45 | 3.27 | 1,18,912 |
| **Percentage/Avg.** | **45.58** | **11.05** | **13.63** | **6.21** | **13.44** | **5.02** | **1.32** | **3.68** | **1,24,427** |

*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 61.91% said below NRs. 10000 per month and 24.49% said NRs. 10000 t0 15000 per month and 2.04 % above 25000(Table- 6.36).

**Table - 6.36: Required Monthly Incomes of the PAFs**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **VDC/Municipality** | **HHs by Required Monthly Income** | | | | | | |
| **Upto 5000** | **5-10000** | **10-15000** | **15-20000** | **20-25000** | **>25000** | **Total** |
| Hetauda Municipality | 2 | 3 | - | - | - | 2 | 7 |
| Basamadi | 2 | 11 | 7 | 4 | 2 | 1 | 27 |
| Manahari | 8 | 21 | 14 | 7 | 1 | - | 51 |
| Birendranagar | 3 | 9 | 7 | - | 1 | - | 20 |
| Chainpur | 5 | 11 | 1 | - | 1 | - | 18 |
| Jutpani | 3 | 1 | 2 | - | - | - | 6 |
| Piple | 3 | 8 | 3 | - | - | - | 14 |
| Shaktikhor | - | 1 | 2 | - | 1 | - | 4 |
| Total | 26 | 65 | 36 | 11 | 6 | 3 | 147 |
| **Percentage** | **17.69** | **44.22** | **24.49** | **7.48** | **4.08** | **2.04** | **100.00** |

*Source: Household Survey, 2011*

* + - 1. **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, 92.52% use fuel wood as source of energy for cooking. Similarly, 4.76% households use LPG and 2.72% use kerosene for cooking (Table 6.37).

**Table- 6.37: Source of Energy for the Surveyed Households for Cooking Purpose**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **VDC/Municipality** | **Sources** | | | | | |
| **Fuel wood** | | **Kerosene** | | **LPG gas** | |
| **HHs** | **%** | **HHs** | **%** | **HHs** | **%** |
| Hetauda Municipality | 7 | 100 | - | - | - | - |
| Basamadi | 25 | 92.6 | 2 | 7.4 | - | - |
| Manahari | 50 | 98 | 1 | 2 | - | - |
| Birendranagar | 19 | 95 | - | - | 1 | 5 |
| Chainpur | 16 | 88.9 | - | - | 2 | 11.1 |
| Jutpani | 4 | 66.67 | - | - | 2 | 33.33 |
| Piple | 12 | 85.8 | 1 | 7.1 | 1 | 7.1 |
| Shaktikhor | 3 | 75 | - | - | 1 | 25 |
| **Total/percentage** | **136** | **92.52** | **4** | **2.72** | **7** | **4.76** |

*Source: Household Survey, 2011*

Regarding source of fuel wood 96.32% collect fuel wood from community forest, 0.74% collect from private forest and 2.94% purchase from the local markets (Table- 6.38).

**Table -6. 38: Source of Fuel wood for the Surveyed Households in the Project Area**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **VDC/Municipality** | **Source** | | | | | |
| **Community Forest** | | **Private Forest** | | **Purchase** | |
| HHs | % | HHs | % | HHs | % |
| Hetauda Municipality | 7 | 100 | - | - | - | - |
| Basamadi | 24 | 96 | - | - | 1 | 4 |
| Manahari | 48 | 96 | 1 | 2 | 1 | 2 |
| Birendranagar | 18 | 94.7 | - | - | 1 | 5.3 |
| Chainpur | 16 | 100 | - | - | - | - |
| Jutpani | 3 | 75 | - | - | 1 | 25 |
| Piple | 12 | - | - | - | - | - |
| Shaktikhor | 3 | 100 | - | - | - | - |
| **Total/Percentage** | **131** | **96.32** | **1** | **0.74** | **4** | **2.94** |

*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, 49.26% use less than 200 kg, 34.56% use 200-400 Kg, 10.29% use 400-600 Kg and 5.88% use more than 600 Kg fuel wood per month for cooking.

Electricity is the main sources of energy for lighting purpose of the surveyed households in the project area. Of the surveyed households, 84.91% have electricity connection. The other source of energy for lighting purpose is kerosene lamp 8.16% (Table – 6.39).

**Table- 6.39: Source of Energy for lighting Purpose**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **VDC/Municipality** | **Sources** | | | |
| **Electricity** | | **Kerosene Lamp** | |
| **HHs** | **%** | **HHs** | **%** |
| Hetauda Municipality | 6 | 85.7 | 1 | 14.3 |
| Basamadi | 25 | 92.6 | 2 | 7.4 |
| Manahari | 49 | 96.1 | 2 | 3.9 |
| Birendranagar | 18 | 90 | 2 | 10 |
| Chainpur | 15 | 83.3 | 3 | 16.7 |
| Jutpani | 6 | 100 | - | - |
| Piple | 13 | 92.9 | 1 | 7.1 |
| Shaktikhor | 3 | 75 | 1 | 25 |
| Total | 135 | 91.84 | 12 | 8.16 |

*Source: Household Survey, 2011*

**6.3.4 Agricultural Information**

**6.3.4.1 Landholdings of the PAFs by Type of Land**

The surveyed households own and operate 52.80 ha land (Table -6.40). This land consists of three types, namely *Khet* (lowland – irrigated and un-irrigated), *Bari* (upland) and *Ghaderi* (plots for house construction). The average land holding of the affected households is 0.36 ha which is higher than the average land holding size of the project affected VDCs/Municipalities (0.23ha/hh) and lower as compared with the project affected districts (0.54ha/hh).

**Table -6.40: Landholdings of the PAFs by Type of Land**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **VDC/Municipality** | **HHs** | **Irrigated Khet(ha)** | **Unirrigated** | **Bari**  **(ha)** | **Ghaderi**  **(ha)** | **Total**  **(ha)** | **Ha/HHs** |
| **Khet(ha)** |
| Hetauda Municipality | 7 | 0.767 | 1.1175 | 2.1538 | - | 4.038 | 0.577 |
| Basamadi | 27 | 4.2416 | 4.5243 | 5.865 | - | 14.631 | 0.542 |
| Manahari | 51 | 3.649 | 1.6729 | 5.2796 | 0.9093 | 11.511 | 0.226 |
| Birendranagar | 20 | 4.19926 | 0.81276 | 3.014 | - | 8.026 | 0.401 |
| Chainpur | 18 | 3.1579 | 0.8466 | 1.21914 | 0.0677 | 5.291 | 0.294 |
| Jutpani | 6 | 1.253 | - | 0.767 | 0.034 | 2.054 | 0.342 |
| Piple | 14 | 2.34 | - | 0.6282 | - | 2.968 | 0.212 |
| Shaktikhor | 4 | 4.1654 | - | 0.1185 | - | 4.284 | 1.071 |
| Total | 147 | 23.77 | 8.97 | 19.05 | 1.01 | 52.80 | 3.67 |
| **Average** | **-** | **0.16** | **0.06** | **0.13** | **0.01** | **0.36** | **0.36** |

*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 75.5% households are marginal size farmers (having up to 0.5 ha land), 23.7% small size farmers (having 0.5 to 2.0 ha land) and 0.7% are medium size farmers (having 2.0 to 4.0ha land). Thus, marginal and small landholders comprise about 99.2% of the surveyed households. The land holding of marginal, small and medium size farmer is 41.6%, 53.3%, and 5.1% of the total landholding respectively (Table- 6.41).

**Table -6.41: Distribution of Households by Landholding Size by the type of ownership**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Landholding Categories | | Households | | Total Landholdings | |
| Category | Size of holdings(ha) | HHs | % | Area (ha) | % |
| Marginal | Up to 0.5 | 111 | 75.5 | 21.95 | 41.6 |
| Small | 0.5 - 1 | 28 | 19 | 17.686 | 33.5 |
| 1.0 – 1.5 | 4 | 2.7 | 4.936 | 9.3 |
| 1.5 – 2.0 | 3 | 2 | 5.52 | 10.5 |
| Medium | 2.0 – 4.0 | 1 | 0.7 | 2.7092 | 5.1 |
| Total | | 147 | 100 | 52.80 | 100 |

*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, 16.33% are female headed households and 83.67% are male headed households. Similarly, 81.24% of the operated land is belonged to the male headed households and remaining 18.76% land is belonged to the women headed households. The average land holding size of male and female headed households is 0.35 and 0.41 ha/Hhs respectively. The female headed households are only marginal and small size farmers (Table -6.42).

Table - 6.42: Landholding by Sex of Household Head

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Landholding Categories** | | **No. of HHs** | | **Total Area(ha)** | | **Landholding(ha/hh** | |
| Category | Size of holding | Male -headed | Female -headed | Male-headed | Female- headed | Male -headed | Female- headed |
| Marginal | Up to 0.5 | 93 | 18 | 17.596 | 4.3533 | 0.189 | 0.242 |
| Small | 0.5 – 1.0 | 24 | 4 | 15.1123 | 2.57374 | 0.63 | 0.643 |
| 1.0 – 1.5 | 3 | 1 | 3.58122 | 1.3546 | 1.194 | 1.3546 |
| 1.5 – 2.0 | 2 | 1 | 3.8945 | 1.6255 | 1.947 | 1.6255 |
| Medium | 2.0 – 4.0 | 1 | - | 2.7092 | - | 2.7092 | - |
| Total | 147 hhs | 123 | 24 | 42.89 | 9.91 | 0.35 | 0.41 |
| **Percentage** | **100** | **83.67** | **16.33** | **81.24** | **18.76** | **-** | **-** |

*Source: Household Survey, 2011*

***Landholding by Caste/Ethnicity***

Of the surveyed households, 42.68% land belongs to Tamang while 26.39% Brahmin/Chettri. The land holding of Chapang, Newar and others (Gurung, Magar, Rai) are is 3.32%, 5.93% and 16.07% of the total operated land respectively (Table- 6.43).

**Table - 6.43: Landholding size by Caste/Ethnicity**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Caste/Ethnic Group** | **Total Landholding(Ha)** | **%** | **Households** | **Average Land holding(ha/hh)** |
| Chepang | 1.75 | 3.32 | 9 | 0.20 |
| Tamang | 22.53 | 42.68 | 58 | 0.39 |
| Gurung,Magar,Rai | 8.49 | 16.07 | 31 | 0.27 |
| Newar | 3.13 | 5.93 | 7 | 0.45 |
| Brahmin/Chhetri | 13.93 | 26.39 | 31 | 0.45 |
| Dalits | 2.97 | 5.62 | 11 | 0.27 |
| **Total/Average** | **52.80** | **100.00** | **147** | **0.36** |

*Source: Household Survey, 2011*

The land transaction of the affected households is very low. According to the households’ survey, only 6.12% households had sold their land during the last five years. Out of them 44.44% had sold *Khet* and 55.56 % had sold *Bari*.

**6.3.4.2 Major Crops Area and Agricultural Production**

Paddy, wheat, maize, millet and pulses are the major food crops and cash crops cultivated by the surveyed households. In terms of area coverage, maize cultivation ranks first. The percentage composition of land occupied by different crops like paddy, wheat, millet and pulses is 35.81%, 8.09%, 5.70%, and 5.59% 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, millet, and pulses are 2.10MT/ha, 2.84MT/ha, 2.53MT/ha, 0.86MT/ha, and 1.87MT/ha respectively (Table- 6.44).

**Table -6.44: Major Crop Area Coverage, Production and Yield**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Description** | **Major Crops** | | | | |
| **Paddy** | **Wheat** | **Maize** | **Millet** | **Pulses** |
| Total Area Cropped(ha) | 21.28 | 4.81 | 26.63 | 3.39 | 3.32 |
| Khet(ha) | 17.47 | 3.78 | 7.01 | 1.16 | 1.21 |
| Bari(ha) | 3.81 | 1.03 | 19.62 | 2.23 | 2.11 |
| Total Product(MT) | 89.38 | 13.67 | 67.34 | 2.92 | 6.2 |
| **Yield(MT)** | **2.10** | **2.84** | **2.53** | **0.86** | **1.87** |
| **Percentage** | **35.81** | **8.09** | **44.81** | **5.70** | **5.59** |

*Source: Household Survey, 2011*

**6.3.4.3 Livestock Distribution**

Livestock ownership is an integral part of agriculture and one of the major income sources for the surveyed households. Of the surveyed households, about 70.07% have livestock. According to household survey, of the total livestock 17.10 % are cattle, 69.50% are goat/sheep, 11.80% are buffalo and 1.60 % are pig etc. The average livestock holding size of the surveyed households is 5.73 (Table -6.45).

**Table -6.45: Livestock Distributions of the PAFs**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **VDC/Municipality** | **Type of Livestock** | | | | | |
| **Cattle** | **Buffalo** | **Goat/Sheep** | **Pig** | **Total** | **Average per HHs** |
| Hetauda Municipality | 14 | 6 | 25 | - | 45 | 6.43 |
| Basamadi | 35 | 20 | 142 | - | 197 | 7.3 |
| Manahari | 44 | 29 | 163 | 2 | 238 | 4.67 |
| Birendranagar | 18 | 15 | 90 | 4 | 127 | 6.35 |
| Chainpur | 12 | 12 | 83 | 6 | 113 | 6.23 |
| Jutpani | 3 | 4 | 26 | - | 33 | 5.5 |
| Piple | 16 | 10 | 42 | 2 | 70 | 5 |
| Shaktikhor | 2 | 3 | 14 | - | 19 | 4.75 |
| Total | 144 | 99 | 585 | 14 | 842 | 5.73 |
| **Percentage** | **17.10** | **11.80** | **69.50** | **1.60** | **100.00** | **-** |

*Source: Household Survey, 2011*

* + - 1. **Fruit Trees timber and fodder**

Fruit trees are the sources of additional income of the surveyed households. Bhogate, Lemon, Nibuwa, Mango, Guava, Katahar and Litchi are the major fruit trees grown by the PAFs. Altogether 287 trees are recorded (including fruit tree, fodder and timber trees) with 134 surveyed households. Of the recorded trees about 54.36% are more than five years of age and 45.64% are less than five years (Table -6.46).

**Table -6.46: Fruit Trees timber and Fodder**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Tree Type** | **No. of Trees by Ownership and Age of Trees** | | | **Total** | **Percentage** |
| **Fruit Trees** | **HHs** | **< 5** | **>5** |  |  |
| Bhogate | 3 | 2 | 1 | 3 | 1.05 |
| Guava | 10 | 6 | 8 | 14 | 4.88 |
| Katahar | 15 | 19 | 14 | 33 | 11.50 |
| Lemon | 9 | 8 | 5 | 13 | 4.53 |
| Lichi | 4 | 2 | 3 | 5 | 1.74 |
| Mango | 32 | 21 | 25 | 46 | 16.03 |
| Peach | 4 | 3 | 3 | 6 | 2.09 |
| Papaya | 11 | 17 | 2 | 19 | 6.62 |
| Nibuwa | 5 | 7 | 2 | 9 | 3.14 |
| **Total** | **93** | **85** | **63** | **148** | **51.57** |
| Fodder Trees | 22 | 18 | 72 | 90 | 31.36 |
| Timber | 19 | 28 | 21 | 49 | 17.07 |
| Total | 134 | 131 | 156 | 287 | 100 |
| **Percentage** | **-** | **45.64** | **54.36** | **100** | **-** |

*Source: Fields survey, 2011*

**6.3.5 Drinking Water Health and Sanitation**

**6.3.5.1 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, 63.27% have access to piped water. Similarly, 17.69% households collect water from tube-well and 19.05% from piped water supply (Table-6.47). The data shows that one public tap is used by at least 15 families.

**Table 6.47: Source of Drinking Water of the Surveyed Households**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **VDC/Municipality** | **Sources** | | | | | |
|  | **Piped Water** | | **Tube Well Water** | | **Public Tap** | |
|  | Hhs | % | Hhs | % | Hhs | % |
| Hetauda Municipality | 4 | 57.1 | 2 | 28.6 | 1 | 14.3 |
| Basamadi | 5 | 18.5 | 7 | 25.9 | 15 | 55.6 |
| Manahari | 17 | 33.3 | 4 | 7.8 | 30 | 58.8 |
| Birendranagar | 2 | 10 | 2 | 10 | 16 | 80 |
| Chainpur | - | - | 3 | 16.7 | 15 | 83.3 |
| Jutpani | - | - | 2 | 33.33 | 4 | 66.67 |
| Piple | - | - | 6 | 42.9 | 8 | 57.1 |
| Shaktikhor | - | - | - | - | 4 | 100 |
| **Total/percentage** | **28** | **19.05** | **26** | **17.69** | **93** | **63.27** |

*Source: Household Survey, 2011*

There is shortage of drinking in the project area. Of the surveyed households, 95.25% said their water demand is fulfilled by the existing sources where as 4.75% have water scarcity. The scarcity of drinking water is high in Manahari VDC as compared to the other VDCs.

* + - 1. 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 77.55% of the surveyed households in the project area. The remaining 22.45% household use river side/, open fields (6.12%) and forest for defecation (16.33%).

**Table 6.48: Location for Defecation by the Surveyed HHs**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **VDC/Municipality** | **Location** | | | | | |
| **Own Toilet** | | **Open Field** | | **Forest Area** | |
| **Hhs.** | **%** | **Hhs.** | **%** | **Hhs** | **%** |
| Hetauda Municipality | 6 | 85.7 | - | - | 1 | 14.3 |
| Basamadi | 22 | 81.5 | 2 | 7.4 | 3 | 11.1 |
| Manahari | 32 | 62.75 | 5 | 10.2 | 14 | 28.6 |
| Birendranagar | 16 | 80 | 1 | 5 | 3 | 15 |
| Chainpur | 16 | 88.8 | 1 | 5.6 | 1 | 5.6 |
| Jutpani | 6 | 100 | - | - | - | - |
| Piple | 12 | 85.7 | - | - | 2 | 14.3 |
| Shaktikhor | 4 | 100 | - | - | - | - |
| **Total** | **114** | **77.55** | **9** | **6.12** | **24** | **16.33** |

*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 65.99% dump waste at safe location. Similarly, 7.48% burn it while 11.56% bury and 14.97% use other methods for waste management. The proportion of households managing waste at safe location is high in Birendrnagar, Shaktikhor, Piple, Basamadi, Manahari and Jutpani VDCs (Table-6. 49).

**Table - 6.49: Methods of Solid Waste Disposal in the Project Area**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **VDC/Municipality** | **Location** | | | | | | | |
| **Dump at Safe Place** | | **Burn** | | **Buried** | | **Others** | |
| **Hhs** | **%** | **Hhs** | **%** | **Hhs** | **%** | **Hhs** | **%** |
| Hetauda Municipality | 4 | 57.1 | 1 | 14.3 | - | - | 2 | 28.6 |
| Basamadi | 18 | 66.7 | 2 | 7.4 | 2 | 7.4 | 5 | 18.5 |
| Manahari | 31 | 61.8 | 4 | 7.84 | 8 | 15.69 | 8 | 15.69 |
| Birendranagar | 14 | 70 | 1 | 10 | 1 | 10 | 4 | 10 |
| Chainpur | 12 | 66.7 | 1 | 5.5 | 2 | 11.1 | 3 | 16.7 |
| Jutpani | 5 | 83.3 | - | - | 1 | 16.7 | - | - |
| Piple | 10 | 71.4 | 2 | 14.3 | 2 | 14.3 | - | - |
| Shaktikhor | 3 | 75 | - | - | 1 | - | - | - |
| **Total/Percentage** | **97** | **65.99** | **11** | **7.48** | **17** | **11.56** | **22** | **14.97** |

*Source: Household Survey, 2011*

**6.3.5.3 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, 31.97% reported family members seriously sick during the last 12 months (Table- 6.50). The proportion of such households is high in Hetauda Municipality (42.9%) and Basamadi VDC (37%).

**Table- 6.50: Household Reporting Sick Family Members during 12 Months**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **VDC/Municipality** | **Sick** | | | | | |
| **Yes** | | **No** | | **Total** | |
| **Hhs** | **%** | **Hhs** | **%** | **Hhs** | **%** |
| Hetauda Municipality | 3 | 42.9 | 4 | 57.1 | 7 | 100 |
| Basamadi | 10 | 37 | 17 | 63 | 27 | 100 |
| Manahari | 16 | 31.4 | 35 | 68.6 | 51 | 100 |
| Birendranagar | 6 | 30 | 14 | 70 | 20 | 100 |
| Chainpur | 4 | 22.2 | 14 | 77.8 | 18 | 100 |
| Jutpani | 2 | 33.33 | 4 | 66.67 | 6 | 100 |
| Piple | 5 | 35.7 | 9 | 64.3 | 14 | 100 |
| Shaktikhor | 1 | 25 | 3 | 75 | 4 | 100 |
| **Total** | **47** | **31.97** | **100** | **68.03** | **147** | **100** |

*Source: Household Survey, 2011*

Of the households reported seriously sick family members about 63.83% were old while 17.02% were youth and 19.15% were children.

**6.3. 6 Knowledge, Attitude and Expectation**

* + - 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 92.52% had knowledge about the project and 7.48% had no knowledge about the project. Of the households who had knowledge regarding the project, 80.15% had received the information from NEA staff/Surveyors, 8.09% from neighbours and 11.76% from other source.

**6.3.6.2 Attitude**

Of the affected households, 88.44% have positive attitude and 2.04% have negative attitude and 9.52% are neutral regarding the project. Regarding reason for negative attitude the affected households suggested to shift transmission line alignment in forest area to avoid the impacts on private land and structures.

**6.3.6.3 Expectation from the Project**

The affected households are expecting employment, good compensation, local development, and electrification from the project. Of the surveyed households,15.65 % expecting employment, 77.55% expecting good compensation 4.08% expecting local development and 2.72% expecting electrification from the project (Table- 6.51). The local development includes support for drinking water, irrigation, health and education, construction of rural roads etc.

**Table- 6.51: Expectation of Local People from the Project**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **VDC/Municipality** | **Expectations** | | | |
| **Good Compensation** | **Employment** | **Electricity** | **Local Development** |
| Hetauda Municipality | 6 | 1 | - | - |
| Basamadi | 19 | 5 | 2 | 1 |
| Manahari | 38 | 8 | 2 | 3 |
| Birendranagar | 15 | 3 | - | 2 |
| Chainpur | 16 | 2 | - | - |
| Jutpani | 6 | - | - | - |
| Piple | 11 | 3 | - | - |
| Shaktikhor | 3 | 1 | - | - |
| Total | 114 | 23 | 4 | 6 |
| **Percentage** | **77.55** | **15.65** | **2.72** | **4.08** |

*Source: Household Survey, 2011*

* + 1. **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.

**6.3.7.1 Choice of Compensation**

The households were asked regarding their willingness to receive compensation in cash or kind. Of the households a majority (90.48%) said that they are willing to receive cash compensation. However, 6.12% said land for land and 3.40% said house for house compensation (Table 6.52).

**Table- 6.52 Choice of compensation**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **VDC/Municipality** | **Choice of compensation** | | |  |
| **Cash** | **Land for Land** | **House for House** | **Total Hhs** |
| Hetauda Municipality | 7 | - | - | 7 |
| Basamadi | 24 | 2 | 1 | 27 |
| Manahari | 47 | 2 | 2 | 51 |
| Birendranagar | 18 | 2 | - | 20 |
| Chainpur | 14 | 2 | 2 | 18 |
| Jutpani | 6 | - | - | 6 |
| Piple | 14 | - | - | 14 |
| Shaktikhor | 3 | 1 | - | 4 |
| Tota | 133 | 9 | 5 | 147 |
| **Percentage** | **90.48** | **6.12** | **3.40** | **100** |

*Source: Household Survey, 2011*

* + - 1. **Use of Compensations**

The households who are willing to receive cash compensation were further asked regarding the use of cash. Of the households, most (83.67%) said they will purchase land from the cash compensation and 8.16% said that they will use the compensation amount for the construction of their house. Similarly, 8.16% said that they will invest the compensation amount for trade and business

* + 1. **Residential status, Resettlement and Rehabilitation**

**6.3.8.1Residential status of PAFs**

Household survey indicates that 98.64% households are living in their own house. Of the total households, 14.29% have expressed that they have residential house or land in the places rather than the project area where as 85.71% expressed that they have no any residential house or land elsewhere in Nepal expect in the project area (Table- 6.53).

**Table-6.53: Households having Residential Land/House in Area other than the Project Area**

|  |  |  |  |
| --- | --- | --- | --- |
| **VDC/Municipality** | **Yes** | **No** | **Total** |
| Hetauda Municipality | - | 7 | 7 |
| Basamadi | 2 | 25 | 27 |
| Manahari | 5 | 46 | 51 |
| Birendranagar | 4 | 16 | 20 |
| Chainpur | 4 | 14 | 18 |
| Jutpani | 2 | 4 | 6 |
| Piple | 3 | 11 | 14 |
| Shaktikhor | 1 | 3 | 4 |
| Total | 21 | 126 | 147 |
| **Percentage** | **14.29** | **85.71** | **100** |

*Source: Household Survey, 2011*

Of the surveyed households who have expressed of having residential land or house in the other place, 76.19% said that they have residential house or land in other VDCs of the project districts while 23.81% households said that they have residential house or land in other districts of Nepal.

* + - 1. **Resettlement and Rehabilitation**

During the household survey, the questions regarding the resettlement and rehabilitation issues were asked. Of the surveyed households 33.33% expressed that they are interested to relocate in other places if they have to leave their place or property for the project while 66.67% household expressed that they do not like to relocate in other place due to several reasons like neighbours, own business, property, etc (Table -6.54)**.**

**Table- 6.54: Willingness of Households for relocation in the other places**

|  |  |  |  |
| --- | --- | --- | --- |
| **VDC/Municipality** | **Yes** | **No** | **Total** |
| Hetauda Municipality | 3 | 4 | 7 |
| Basamadi | 10 | 17 | 27 |
| Manahari | 22 | 29 | 51 |
| Birendranagar | 3 | 17 | 20 |
| Chainpur | 3 | 15 | 18 |
| Jutpani | 1 | 5 | 6 |
| Piple | 5 | 9 | 14 |
| Shaktikhor | 2 | 2 | 4 |
| Total | 49 | 98 | 147 |
| **Percentage** | **33.33** | **66.67** | **100** |

*Source: Household Survey, 2011*

Of the total household who don’t like to relocate in other places 15.31% are due to loss of current business and service, 35.71% due to good neighbors, 30.61% feels problem of adaptation in new society and18.37% are unwillingness due to nearby market and service facilities in the current place (Table -6.55).

**Table- 6.55: Reasons for Unwillingness to relocate in other place**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **VDC/Municipality** | **Reason** | | | |
| **Nearby Market Service Centers facility** | **Possible loss of Business and service** | **Adoption problem in new Society** | **Good Neighborhoods in Current Place** |
| Hetauda Municipality | 2 | 1 | - | 1 |
| Basamadi | 5 | 2 | 4 | 6 |
| Manahari | 7 | 4 | 9 | 9 |
| Birendranagar | 2 | 3 | 6 | 6 |
| Chainpur | 2 | 4 | 4 | 5 |
| Jutpani | - | 1 | 3 | 1 |
| Piple | - | - | 3 | 6 |
| Shaktikhor | - | - | 1 | 1 |
| Total | 18 | 15 | 30 | 35 |
| **Percentage** | **18.37** | **15.31** | **30.61** | **35.71** |

*Source: Household Survey, 2011*

**CHAPTER-VII**

**IMPACT ASSESSMENT**

This chapter addresses the likely adverse and positive impacts of the construction and operation of Hetauda-Bharatpur 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 150 unskilled, 60 semi skilled and 40 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 weir 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.

* + - 1. **Expansion in Rural Electrification**

The proposed transmission line will open the door for expansion of distribution networks through substations of Hetauda of Makwanpur district and at Bharatpur of Chitwan 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.

* + - 1. **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.

* + - 1. **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 6.90 ha private cultivated land (Table-7.1) will be acquired permanently for the construction of the angle towers and Hetauda substation. Of the total affected private land, 0.88ha will be acquired for the construction of towers and 6.02 ha for the construction of Hetauda Substation. The magnitude of impact is considered moderate, extent is local and of long duration.

**Table - 7.1 Required Permanent Land for the Different Project Components**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **S.N.** | **Project component** | **Quantity** | **Required area (ha)** | **Cultivated land (ha)** | **%** | **Remarks** |
| 1 | Substation | - | - | - | - |  |
| a. | Hetauda Substation | 1 | 6.02 | 6.02 | 100 | Cultivated land(acquired) |
| 2 | Tower pads | 226 | 3.16 | 0.88 | 27.85 | Estimation of 36 towers located in the cultivated land(0.016/Tower) |
|  | Total |  | 9.18 | 6.90 | 75.16 |  |
|  | Permanent cultivated Land (Total) =6.90 ha(Including Tower foundation and Hetauda S/S) | | | | | |

**7.2.1.2 Reduction in Agricultural Production**

The acquisition of 6.90 ha of cultivated land will be permanently reduced production of 15.66 Mt food grain annually. This includes 7.82 Mt maize, 5.19 Mt paddy, 1.59 Mt wheat and 1.06 Mt other crops (Table 7.2). The magnitude of impact is considered low, extent is local and of long duration.

**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 (MT)** |
| 1 | Paddy | 6.90 | 35.81 | 2.47 | 2.1 | 5.19 |
| 2 | Wheat | 6.90 | 8.09 | 0.56 | 2.84 | 1.59 |
| 3 | Maize | 6.90 | 44.81 | 3.09 | 2.53 | 7.82 |
| 4 | Millet | 6.90 | 5.7 | 0.39 | 0.86 | 0.34 |
| 5 | Pulses | 6.90 | 5.59 | 0.39 | 1.87 | 0.72 |
| **Total/average** | | **-** | **-** | 6.90 | **-** | **15.66** |

*Source: Fields survey, 2011*

**7.2.1.3 Land Loss of surveyed households**

Out of the 147 surveyed households, 34 households (80.95%) will loss less than 10% of their total land holding where as 8 households (19.95%) 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 0.36ha. The magnitude of impact is considered moderate, extent is local and of long duration (Annex -III).

Table 7.3: Affected HHs by percent of Land Loss

|  |  |  |
| --- | --- | --- |
| % Loss of Land | Angle Point | |
| No. | % |
| < 10 | 34 | 80.95 |
| 10 - 25 | 8 | 19.05 |
| Total | 42 | 100 |

*Source: Household Survey, 2011*

**7.2. 1.4 Loss of Land and Structures by Gender Category**

Of the affected households, female heads 19.05% and male heads 80.95% households. The total land holding of the female headed households is 4.21 ha from which they will lose 2.14% (0.09 ha) of their total land whereas the male headed households will lose ha 4.59% (0.68 ha) of their total holding (Table 7.4). This indicates that male headed households will lose more land than the female headed households. The average land holding size of male and female headed family is 0.44ha/hh and 0.53 ha/ hh respectively. The magnitude of impact is considered moderate, extent is local and of long duration.

**Table- 7.4 : Land Loss by Gender Category**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| S.N. | Type of Headed | Households | % | Total Area (ha) | Land holding(ha) | Land Loss (ha) | % of land loss(In total) |
| 1 | Female Headed | 8 | 19.05 | 4.21 | 0.53 | 0.09 | 2.14 |
| 2 | Male Headed | 34 | 80.95 | 14.83 | 0.44 | 0.68 | 4.59 |
|  | Total/Average | 42 | 100 | 19.04 | 0.45 | 0.77 | 4.04 |

*Source: Household Survey, 2011*

Construction of the project will displace of 115 houses and 56 cowsheds owned by 114 households. This includes 97 households are male headed while 17 households are female headed. The male headed households will lose 99 houses and 48 Cowsheds while female headed households will lose 16 houses and 8 cowsheds (Table-7.5)

**Table-7.5 Structures Loss by Gender Category**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Type of Headed | Households | Percentage | Households loosing Structures | |
|  |  |  | House | Cowsheds |
| Male Headed | 97 | 85.09 | 99 | 48 |
| Female Headed | 17 | 14.91 | 16 | 8 |
| **Total** | **114** | **100** | **115** | **56** |

*Source: Household Survey, 2011*

**7.2.1.5 Acquisition of House and other Structures**

Construction of the project will involve removal of 115 houses and 56 cowsheds owned by 114 households (Annex - III). This includes 103 structures (Including 67 houses and 36 Cowsheds) owned by 68 households of Makwanpur district and 68 structures (Including 48 houses and 20 Cowsheds) owned by 46 household of Chitwan district. Of the affected households due to acquisition of structures 9 are highly marginalized, 53 are marginalized, 21 are disadvantage group, 4 are advanced group and 11 are Dalits (Table 7.6). The magnitude of impact is high, extent is local and of long duration.

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

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Caste | No. of Households | | | | No. of Structures | |
| Only Houses | House and Cowshed | Cowshed only | Total | Houses | Cowsheds |
| Brahmin/Chettri | 6 | 9 | 1 | 16 | 15 | 11 |
| Chepang | 8 | 1 | - | 9 | 12 | 5 |
| Gurung/Magar/Rai | 10 | 11 | - | 21 | 10 | 1 |
| Tamang | 27 | 20 | 6 | 53 | 22 | 11 |
| Newar | 2 | 2 | - | 4 | 52 | 25 |
| Dalit | 6 | 5 | - | 11 | 4 | 3 |
| Total | 59 | 48 | 7 | 114 | 115 | 56 |

*Source: Household Survey, 2011*

***Household Affected by Acquisition of Structures and Land***

Of the 147 affected households, 114 will be affected due to acquisition of structures and 33 by acquisition of land and 9 household will be affected by land and structures. Of the 114 households affected by structures, 48 will loose house and cowshed whereas 59 household will loose house only and 7 household will loose cowshed only (Table 7.7).

**Table -7.7 Household Affected by Acquisition of Structures and Land**

|  |  |  |  |
| --- | --- | --- | --- |
| **S.N.** | **Project Components** | **Type of losing Structure** | **Households** |
| 1 | **RoW** | House and Cowsheds | 41 |
|  | - | House only | 49 |
|  | - | Cowsheds only | 6 |
| 2 | **Tower Foundation** | Land loss only | 33 |
|  | - | Both House and Land loss | 5 |
|  | - | Only House | 5 |
|  | - | House, Cowshed and land(All) | 4 |
|  |  | House and Cowshed only | 3 |
|  |  | Cowshed only | 1 |
| **3** | **Total** | **-** | **147** |

*Source: Household Survey, 2011*

***Types of the affected structures***

Of the total affected houses, 37 (32.17%) are Kachchi (Temporarily residential structures), 74 (64.91%) are semi-pakki and 4 (3.48%) 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 RCCRoof (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** | | | |
| **Kachchi** | **Semi Pakki** | **Pakki** | **Total** |
| Chepang | 4 | 6 | - | 10 |
| Tamang | 8 | 40 | 4 | 52 |
| Gurung,Magar,Rai | 9 | 13 | - | 22 |
| Newar | 2 | 2 | - | 4 |
| Brahmin,Chhetri | 6 | 9 | - | 15 |
| Dalits | 8 | 4 | - | 12 |
| Total | 37 | 74 | 4 | 115 |
| Percentage | 32.17 | 64.35 | 3.48 | 100 |

*Source: Fields survey, 2011*

***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, 82 houses are single floored, 32 houses are of double floored and one house is three floored. The total area of the affected houses and cowsheds are 28932 sq feet and 5432 sq feet for respectively. The average area covered by houses and cow sheds are 251.58 sq. ft and 96 sq. ft. respectively.

The average area covered by the single floored houses ranges from 74.61 sq.feet to 276.78 sq.feet. Similarly, the average area covered by double and three floors house are 382.38 sq. ft. and 930 sq. ft. respectively. Moreover, all the affected cow sheds are of single floored type having an average area ranges from 53.54 sq. ft. to 264.13 sq. ft. (Table-7.9).

**Table- 7.9: Area of Affected Structures**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Area** | **Affected Houses** | **Affected Area(sq.ft)** | | | | | | |
| **Houses** | | | | **Cowsheds** | | |
| **Kachchi** | **Semi Paki** | **Pakki** | **Avg.** | **No.** | **Area** | **Avg.** |
| **Single Floor** | - | - | - | - | - | - | - | - |
| < 100 Sq ft | 18 | 647 | 696 | - | 74.61 | 39 | 2088 | 53.54 |
| 100-150 | 9 | 144 | 890 | - | 114.89 | 8 | 983 | 122.88 |
| 150-200 | 19 | 1629 | 1796 | - | 180.26 | 1 | 192 | 192 |
| >200 | 36 | 2773 | 6731 | 460 | 276.78 | 8 | 2113 | 264.13 |
| **Double Floor** | 32 | 2750 | 8656 | 830 | 382.38 | - | - | - |
| **Three Floor** | 1 | - | - | 930 | 930 | - | - | - |
| **Total** | **115** | **7943** | **18769** | **2220** | **251.58** | **56** | **5376** | **96** |

*Source: Fields survey, 2011*

**7.2.1.6 Loss of Private Trees**

Altogether, 230 trees (including 74 fruit trees, 38 fodder trees, and 44 timber size trees) owned by 87 households will be lost due to the implementation of the project. Of the total lost trees 53.04% are less than five years and 46.96% are more than five years of age. Of the affected trees, about 54.32% are fruit trees, 20.99% are fodder trees and 24.69% are timber size trees (Table- 7.10). The magnitude of impact is considered low, extent is site specific and of long duration.

**Table -7.10: Loss of Private Trees**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Tree Type** | **No. of Affected Trees by Ownership and Age of Trees** | | | **Total** | **percentage** |
| **Fruit Trees** | **HHs** | **< 5** | **>5** |  |  |
| Bhogate | 1 | 1 | - | 1 | 0.82 |
| Guava | 7 | 3 | 5 | 8 | 6.17 |
| Katahar | 10 | 3 | 5 | 8 | 7.41 |
| Lemon | 5 | 5 | 2 | 7 | 4.94 |
| Lichi | 3 | 1 | 2 | 3 | 2.47 |
| Mango | 21 | 16 | 15 | 31 | 21.4 |
| Peach | 3 | 1 | 2 | 3 | 2.47 |
| Papaya | 7 | 12 | - | 12 | 7.82 |
| Nibuwa | 1 | 1 | - | 1 | 0.82 |
| **Total** | **58** | **43** | **31** | **74** | **54.32** |
| Fodder Trees | 13 | 10 | 28 | 38 | 20.99 |
| Timber | 16 | 26 | 18 | 44 | 24.69 |
| **Total** | **87** | **122** | **108** | **230** | 100 |
| P**ercentage** | - | **53.04** | **46.96** | **100** | - |

*Source: Fields survey, 2011*

## 7. 2.1.7 Affected Community Structures

***School***

The school compound of Shree Lower Secondary School located at Juitpani VDC ward no 3 of Chitwan district falls under the transmission line RoW between tower no 18D/0 to 18/E. This is government school and 500 students are currently studying in the school. The school building is made up with RCC. The magnitude of impact is considered high, extent is local and of long duration.

**7.2.1.8 Cultural and Religious Sites**

Altogether, 5 religious structures (2 temples, 2 Gumbas and 1 church) will be affected due to implementation of the project (Table 7.11). These temples are of low height and of local significance. Of the total affected religious structures, 1 temple is located in community forest area. The magnitude of impact is considered moderate, extent is local and of long duration.

**Table -7.11: Type of religious structures by location**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S.N** | **Name of VDCs/Municipalities** | **Religious sites** | **Significance** | **Location** |
| 1 | Birendranagar VDC-1, Six Group | Bagdevi Mandir | Local significance within settlement | Tower 15/2 to 15/3 |
| 2 | Manahari VDC-3, Manahari | Church | Local significance within settlement | Tower 9/2 to 10/0 |
| 3 | Manahari VDC-1 (Mahadev Tar), Lothar | Gumba | Local significance within settlement | Tower 11/7 |
| 4 | Piple VDC-7 | Gumba | Local significance within settlement | Tower 12/1 to 12/2 |
| 5 | Birendranagar VDC-2 | Baglung Kalika Mandir (Memorial temple) | Worship not found, structure is fractured | Tower 16/6 to 16/7 |

*Source: Field survey, 2011*

## 7.2.1.9 Impact on Community Facility, Services and Resources

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 168 ha forest mostly community forest from two project districts. Furthermore, due to use of forest resource by workforce pressure on forest resource will also increase. Considering nature of the project loss of forest area with respect to total available forested area and availability of local labor the likely impact on community resources is considered to be low, site specific and of short term.

**7.2.1.10 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.

**7.2.1.11 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. The availability of cash and alcohol may attract workers towards gambling and greater alcohol consumption and prostitution. There may be cause of absconding women from the area, which is not acceptable in the society. The Terai community is more traditional and conservative regarding such activities.

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.

**7.2.1.12 Health and Sanitation**

Manpower will be deployed for concreting of tower foundation, excavation, stringing of line and construction of substation. 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. 13 Loss of firewood, fodder and Timber from community forests**

The implementation of the proposed project will affect 168 ha forest area of 2 project districts. Altogether 52000 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 group 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. Like wise 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 78 % 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 6.90 ha resulting to loss of 15.66MT of cereal crop. Similarly, due to the temporary utilization of land (46. 20 ha), there will be loss of 104.42 MT of cereal crop. 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 Bhairavdanda (Hetauda Municipality), Kuna Tole, Lewat, Rai Tole, Magar Tole (Basamadi VDC), Jaising, Kharan, Manahari Bazar, Lother, Danda Gaun (Manahari VDC), Jhurjhure (Piple VDC), Dhaduwa Basti (Bhandara VDC), Six Group, Three Group, Parbat Basti, Gahate, Seetal Basti, Gairabari Tole (Birendranagar VDC), Siddhipur, Gaida Aahal, Bangabar(Chainpur VDC), Majuwa Tole (Shaktikhor VDC), and Jutpani Bazar(Jutpani VDC) are the major centers that have high potentiality of developing as urban area. 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 0.016 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 in 36 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 46.20 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 prevailing Regulations of GON/NEA.

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 minimized. 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 Reduction in Agricultural Production**

The acquisition of 6.90 ha of cultivated land will be permanently reduced production of 17.36 Mt food grain annually. . This includes 7.82 Mt maize, 5.19 Mt paddy, 1.59 Mt wheat and 1.06 Mt other crops. The magnitude of this impact is considered to be low, extent is site specific and duration is long term.

**7.2.2.5 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.

**7.2.2.6 Livelihood**

A total of 6.90 ha cultivated land will be permanently acquired by the project for the placement of towers and substations. Of the surveyed households 73.5 % 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 **15.66** 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.

**7.2.2.7 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. Although specific biological responses to the electromagnetic fields (EMF) associated with current-carrying conductors is still unknown, evidence suggests that health hazards may exist due to EMF. As such, the transmission of electrical energy through the conductors of the proposed line may pose risks and hazards to the surrounding environment and nearby residents. The overall magnitude of impact is considered to be low, extent is site specific and duration is long term.

# CHAPTER-VIII

# 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 150 unskilled, 60 semi skilled and 40 skilled manpower. The unskilled and semiskilled manpower will be recruited from local to the extent possible. The following priority for the recruitment is proposed:

* Project Affected Families
* Project Affected VDCs
* Project districts
* Nepal
* Other countries

**8.2.2 Community/ Social Support Program**

Although these programs are not directly related to the project development but 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 permanently 6.90 ha private land, 115 residential structures and 56 cow-sheds. 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 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 and undertake the valuation of assets. The CDC will consist of:

* Chief District Officer of concerned district,
* District Land Revenue (Malpot) Officer of concerned district,
* Representative of the District Development Committee of concerned district,
* Representative of concerned VDC,
* Representatives of affected communities and households, and
* Representative of the Project.

### *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. 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 and substation located in rural, semi urban and urban areas. There are three types of land to be acquired i.e. land of urban area, semi-urban area and rural area.

The total compensation cost of permanently acquired land (6.90 ha) is estimated to be Rs. 12, 08, 10,000 (Table 8.1).

**Table-8.1: Compensation for permanent land**

|  |  |  |  |
| --- | --- | --- | --- |
| **Land classification** | **Land area (ha)** | **Price/ha** | **Total amount (Rs.)** |
| Urban area | 6.11 | 18000000 | 109980000 |
| Semi Urban Area | 0.45 | 15000000 | 6750000 |
| Rural Area | 0.34 | 12000000 | 4080000 |
| **Total** | **6.90** | **-** | **120810000** |

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 area followed by semi-urban and rural area 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 consist 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 115 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 115 houses is estimated to be Rs. 2, 50, 00,000 (Table-8.2).

**Table-8.2: Compensation for affected house**

|  |  |  |  |
| --- | --- | --- | --- |
| **Type of house** | **No. of house** | **Average price (Rs.)** | **Amount (Rs.)** |
| Kachchi | 37 | 100000 | 3700000 |
| Semi-pakki | 74 | 250000 | 18500000 |
| Pakki | 4 | 700000 | 2800000 |
| **Total** | **115** | **-** | **2,50,00,000** |

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 56 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. 14, 00,000.

***Land occupied by structures***

The average area covered by all types of houses and cow sheds are 251.58 sq. ft and 96 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 compensation for 28932 sq. ft. plinth area is estimated to be Rs. 3, 32, 23,500. Similarly, compensation for land occupied by 56 cow sheds (plinth area=5376 sq. ft) is estimated to be Rs. 53, 76,000.

***Private Trees***

Due to the implementation of the project, altogether 156 standing trees will be lost including 74 fruit trees, 44 timbers and 38 fodder 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 3, 11,000 (Table-8.3).

**Table 8.3: Compensation of Private Trees**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S.N** | **Type of Trees** | **Total No** | **Average Price/tree** | **Total price** |
| 1 | Fruits Tree | 74 | 2500 | 185000 |
| 2 | Fodder Trees | 38 | 1000 | 38000 |
| 3 | Timber Trees | 44 | 2000 | 88000 |
|  | **Total** | **156** | **-** | **311000** |

*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.

***Community and private infrastructure***

Two community structures (view tower and resting place) will be relocated in the adjoining area in due consultation with local people and other stakeholders. The project will relocate these community structures along with better facilities at its own cost. The estimated relocation cost is Rs. 4, 00,000 (Table-8.4).

**Table-8.4: Compensation for community and private infrastructures**

|  |  |  |
| --- | --- | --- |
| **S. N** | **Name of community infrastructure** | **Mitigation cost (Rs.)** |
| 1 | Resting House (Maya Namara Pratikchhyalaya) | 1,00,000 |
| 2 | View Tower (Picnic Spot) | 3,00,000 |
|  | **Total** | **4,00,000** |

***Religious site***

Altogether, 5 religious structures of local significance will be affected due to implementation of the project. The average height of temples, Gumbas and Church is below 7 meters. These structures will be relocated in near by areas in consultation with local communities. Initial discussion was made with local people and they are agreed to shift these old religious structures with modern temple. The estimated cost for the relocation of these temples is NRs 2500000/-.

**Table-8.5: Religious Sites in the Project area**

|  |  |  |  |
| --- | --- | --- | --- |
| S.N | Name of VDCs/Municipalities | Affected Religious sites | **Proposed sites for Relocation** |
| 1 | Birendranagar VDC-1, Six Group | Bagdevi Mandir | Six group |
| 2 | Manahari VDC-3, Manahari | Church | Manahari settlement |
| 3 | Manahari VDC-1 (Mahadev Tar), Lothar | Gumba | Lothar |
| 4 | Piple VDC-7 | Gumba | Piple |
| 5 | Birendranagar VDC-2 | Baglung Kalika Mandir (Memorial temple) | Birendranagar |

*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 34 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 8 households fall under severely affected 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 livelihood assistance 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 training and fresh vegetable 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 seed money equal to 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 115 houses of two districts owned by 107 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 and other accessories (hand pump, dug-well). 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 household only 33.33% of surveyed households have expressed that they are interested to displace in other area if they have to leave their place or entire property for the project while 67.67% households expressed that they do not like to relocate 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 to be 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(Hh Size) 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.

### Enhancement Measures for Vulnerable Households

There are 39 households (women headed=24, Dalits=7 and highly marginalized group like Chepang=8) of vulnerable categories. A vulnerable Community Development Plan has been prepared to minimize the impacts on vulnerable community. The plan includes detail assessment of vulnerable community and appropriate mitigation and enhancement program to minimize the project impacts.

### 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, street drama, 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. The cost required for awareness program is covered in SIA conducted for the project.

### 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 staff. 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. 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. The cost required for awareness program is covered in SIA conducted for the project.

## 8.2.1.4 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 at Hetauda and Bharatpur 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. The safety training for the project workers will be conducted at 4 places, including two in each district. The training program will be of at least 3 days which will include practical classes, use of safety equipments, first aid. Community safety awareness programs about the T/L and potential risks associated with T/L construction will too be implemented (at least one in each district). The project workers involved in construction work in each district will also be trained for health and occupational safety measures.

## 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 exists 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 46.20 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 Table 8.6.

**Table-8.6: Compensation for R-O-W Land**

|  |  |  |  |
| --- | --- | --- | --- |
| **Land classification** | **Land area (ha)** | **Price/ha** | **10 % compensation amount (Rs.)** |
| Urban area | 12.94 | 18000000 | 23298480 |
| Semi Urban Area | 28.10 | 15000000 | 42157044 |
| Rural Area | 5.15 | 12000000 | 6182256 |
| **Total** | **46.20** | **-** | **71637780** |

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. If the remaining land in a parcel is not applicable or difficult for the cultivation, the project will compensate the remaining land of the particular land parcel. The project will provide compensation for this land at prevailing market price. The ownership of such land will be transferred in the name of project.

**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. The awareness program also includes awareness regarding not to getting close to the transmission line especially those person who have pacemaker and other similar devices transplanted in their body. 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 Hetauda-Bharatpur Transmission line (HBTL) 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 mason, basic plumbing, house wiring, gas wilding, fabrication, driving, tailoring etc. as per their interest.

Loss of private and community assets will be valued and compensated based on the entitlement matrix given in Table 8.7 below.

**Table 8.7: 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 | * + - * Primary land and building valuation will be done by the proposed Project       * Due consultation will be made with Department of Housing and Planning for the valuation of structures       * CDC will be farmed 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 household are also entitle 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, hand pump, dug-well, 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 and other private structures | * Non title holders | Compensation at replacement value for loss of structures. However, compensation will not be paid for the lands illegally occupied by the structure. | * + - * Compensation determination by CDC and advance notice to vacate the structure       * In addition to cash compensation, livelihood improvement/ income restoration measures i.e. employment, skill training will be considered. |
| **2. Land** | | | |
| 2.1 Loss of private land | * Titleholder | * + - * Provide compensation at full replacement cost       * Provide cash compensation at full replacement cost based on current market rate or Government rate which ever is higher.       * In the case of farmland, the PAP/HH will be entitled the cultivation disruption allowance equal to one crop production. | * + - * Primary land valuation will be done by the project       * CDC will be farmed 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.       * Notice to vacate will be provided at least 35 days prior to acquisition date.       * Cash compensation will be provided either by cash or by cheque, depending upon the owner’s preferences.       * To ensure fair compensation, rates will be established not more than one year prior to property acquisition |
| 2.2 Loss of private land | * Non title holder/tenant | * + - * Non title holder/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 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 agreed with owner. | * + - * A lease contract will be signed 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. |
| **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 CDC (based on prevailing market price and in consultation with local stakeholders) |
| 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 for future production losses, based on 5 years annual net production for fruit/fodder trees and 3 years annual net production for timber/fuel wood trees and other perennial crops.       * Right to all other resources from privately owned trees | * + - * Crop market values and production losses will be determined by the CDC (based on prevailing market value and in consultation with local stakeholders)       * The proponent will assist the affected owners and communities with the reestablishment of new trees and other perennial crops. |
| **4. Community Structures and Resources** | | | |
| 4.1 Community buildings and Structures | * Local Community | * + - * Community buildings and structures include: schools, temples, tube-well, dug-well 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 | * + - * Assistance for plantation       * Restoration of access to community resources. | * + - * The proponent will assist communities in coordination of GON line agencies (District Forest Office, District Agriculture Development Office) and CFUGs for plantation |
| **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. |
| 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 including the following assistance:  **Livelihood Assistance:**  Eight household will receive small amount for their livelihood assistance (Incorporated in RAP report).  **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, assistance and livestock 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 (Incorporated in RAP report).  **Livestock Training and Assistance**  8 households will be encouraged and assigned for Livestock training and assistance especially the pig, goat and poultry. Livestock training program will be implemented in collaboration and coordination with displaced households and other concerned agencies in the project area (Incorporated in RAP report)  **3. Household loosing Structures(House)**  **Basic Technical Skill Training**  One family member of each affected household will be provided technical training in the areas of driving, plumbing, house wiring , Motor rewinding training and Repair and maintenance of Mechanical and electrical equipments’ as per their interest from government recognized training institutions (Incorporated in RAP report).  **Priority for Employment:**  First priority will be given to the family members of the households for employment in project construction |
| 5.3 Vulnerable social categories | * Affected households | * + - * Vulnerable social categories actually affected by the project will be identified as:   - Dalits  -Women headed households   * + - * - Landless households       * Highly marginalized groups       * Single Women and households headed with disabilities/old age etc. | * + - * Assistance in reestablishment 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. | * + - * An assessment for maintaining that kind of vegetation       * 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 distribution of pamphlets, leaflet, posters, street-drama, 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-IX

# Institutional Arrangement

**9.1 Background**

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 programs and activities proposed in SIA.

As the project authority, Hetauda- Bharatpur 220 kV Project (HBTLP) will assume overall responsibility for the management procedures. Key activities to be undertaken to ensure effective implementation of social mitigation measures and community support program are given below:

In HBTLP, there are 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 program for mitigation measures and community support program | In coordination with DoED/Line Ministry and other high level bodies. |
| Distribution and Consumer Service, NEA | Planning, supervision and implementation of rural electrification program in project VDCs through its district level offices | Coordination with central office of NEA. |
| NEA/ESSD | Planning, supervision and implementation of mitigation measures and community support program and progress reporting. | In close coordination with the CBOs, NGOs and local consulting firm. |
| HBTLP/ ESMU | Monitoring of the program implementation, supervision and scheduled progress reporting of field work. | ESMU to be set up as a wing of ESSD to carry out environmental and social management of the project. |
| CDC | The CDC is a body with legal stand which will be responsible to address all issues/ grievances relating to land and property falls in RoW | Will work in close coordination with other actors of Grievances Redress Mechanism viz ESMU, Land Acquisition Unit and LCF. |
| LCF | The LCF 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 LCF to carry out its roles/ functions. |
| NGOs/CBOs/Local Consulting Firm | Specialized/ capable NGOs/CBOs/Local Consulting Firm to work responsibly For implementation of mitigation measures and community support program | Work in close coordination with APs/ ESMU/ Project/ESSD/DCS |

* Establishment of CDC and its procedures for the co-ordination of resettlement and compensation activities,
* Establishment of Local Consultative Forum (LCF) 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 community support program, and
* Collaboration with NGOs/CBOs to provide grassroots expertise and resources in the areas such as project information campaigns, awareness raising, safety training and implementation of community support program.

## 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 and community support program. 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) Distribution and Consumer Services, NEA**

The Distribution and Consumer Services (DCS) of NEA will be responsible for the implementation of rural electrification in project VDCs. The DCS will mobilize its district level and local units for the implementation of the rural electrification program.

**ii) Environment and Social Studies Department**

ESSD is one of the three departments of Engineering Services of NEA and executes all the activities related to identifying, conducting and coordinating environmental aspects of project 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 social mitigation work and community support program 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 and community support works. The program coordinator will be assisted by environmental and social expert at central and local level.

**iii) 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.

#### iv) Panel of Expert

The project proponent will hire independent Panel of Expert (PoE) to make sure the mitigation measures, community support program and monitoring works are implemented according to plan. The PoE shall include environmental and social expert with relevant experience in environment management of the transmission line projects. The experts will review the work conducted by HBTL-EMU and LCF to provide their suggestion for improvement if required based on the ground condition.

### *9. 2.2 Project Level Arrangement*

**i) Project Manager**

The HBTL 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 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-.

**ii) Hetauda- Bharatpur Environment and Social Management Unit (HBTL- ESMU)**

HBTL Environment and Social Management Unit has been established under ESSD umbrella for day to day environmental and social management 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, HBTL 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. 2.3 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 x

# Implementation Schedule

**10.1 Schedule**

The HBTL 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 training and 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: Implementation Schedule of SIA** | | | | | | | | | | | | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **S.N.** | **Tasks** |  | **2011** | | | **2012** | | | | | | | | | | | | **2013** | | | | **2014** | | | |
| 9 | 10 | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| 1 | Contract agreement with Contractors |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2 | Route alignment final suvey by Contrcator |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3 | Finalize list of affected people in consultation with PAPs/HHs |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 4 | Consultation, and grievance resolution committee formation |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 5 | CDC meeting and compensation determination |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 6 | Notification to the HH affected by the structures falls in RoW |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 7 | Notification to the HH affected by the RoW |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 8 | Verify the application and prepare final list of PAPs/HHs |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 9 | Implementation of social awareness program |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 10 | Implementation of saftety training and community saftey awareness program |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 11 | Health and sanitation awareness and health checkup |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 12 | Rural electrification and other community support program |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 13 | Progress Monitoring of SIA Implementation |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 14 | Monitoring and evaluation of SIA imp. |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 15 | SIA completion report |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

# CHAPTER-XI

# MONITORING AND EVALUATION

**11.0 Background**

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 it by the project.

## 11.1 Monitoring

Internal and external 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.

**11.1.1 Internal Monitoring**

The project will conduct internal monitoring of the social activities especially the compensation, resettlement and rehabilitation grant and other social parameters arises during project implementation. The project will prepare **social report** prior to start (just before start) of construction work. The report includes the changes in baseline situation and site condition prior to start of actual construction work.

**11.1.2 External Monitoring**

An independent consultant will be hired for social monitoring of the project. The consultant will establish Environment and Social Monitoring Unit (ESMU) at site for day to day monitoring of the social impacts.

The unit will conduct monitoring work based 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:

The consultant through its team will be required to submit quarterly reports regarding progress of SIA implementation. Field level monitoring will be carried out through:

* 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
* PRA
* 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 near by hotels, settlement etc. |
| Public health | Types of disease and incidence of disease in the project workers and local community | Meeting and discussion with local health posts and district hospitals | Quarterly | Project affected VDCs |
| 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 | Leases area |
| 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, Lunthar park area etc |
| 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 two years 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 (3 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-XII

# PROGRAM COST, SOURCE OF FUNDING, BUDGETARY PROCESS AND TIMING OF EXPENDITURE

## *Mitigation Measures Cost*

## *The estimated cost of mitigation measures and community support program is Rs. 83.24 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 is included in total environmental and social management cost of the project for which MoU has been signed with Environment and Social Studies Department of NEA.*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **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 |  |  |  |  |  |  |
|  | Safety training to supervisors selected workers and other project staffs | Nos | 60 | 10000 | 0.5 | 0.1 | 0.6 |
|  | Community safety awareness program | Nos | 4 | 100000 | 0.4 | 0.2 | 0.6 |
|  | Health and sanitation awareness and health checkup | Nos | 2 | 200000 | 0.4 | 0 | 0.4 |
|  | Land Use Restriction |  |  |  | 71.64 | 0 | 71.64 |
|  | **Sub-total -A** |  |  |  | **72.94** | **0.3** | **73.24** |
| 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)** |  |  |  | **79.44** | **3.8** | **83.24** |

## *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.

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## *12.3 Budgetary Process and Timing of Expenditure*

The expenses required for the SIA will be made within 3 years of project development with major expenses during construction phase followed by one year project operation. 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. The community support program will be mostly implemented during construction phase to create positive environment for project implementation.

**CHAPTER-XIII**

**CONCLUSION**

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 unprecedented load shedding since the last 5 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 Hetauda- to Bharatpur 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 Hetuda-Bharatpur Transmission Line is 72 km in length. The TL starts from existing Hetauda substation located at Hetauda Municipality Ward no 1 Chaukitole of Makwanpur district and terminates at the proposed Bharatpur substation located at Jaladevi Community Forest land at Bharatpur Municpality of Chitwan district. Out of the total 72 km length of the transmission line, 56 km falls along forest and bushes including barren land, road, river etc and 16 km over the cultivated land.

The proposed alignment passes through 8 VDCs and one municipality of Chitwan district and 2 VDCs and one municipality of Makwanpur districts.

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.

The major socioeconomic and cultural environmental impact includes acquisition of 6.90 ha cultivated land owned by 47 households (42 Tower Foundation and 5 Substation), relocation of 115 houses and 56 cowsheds owned by 114 households of 2 districts, removal of 230 private trees, impact on school compound and 5 religious structures, loss of standing crop, land use restrictions in RoW and occupational safety.

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.