CHAPTER - I

INTRODUCTION

1.1 Background

Nepal is a landlocked Himalayan country. Out of the total area of this country nearly two-third is occupied by Mountains and Hills and rest part is Tarai. The population distribution of Nepal is like half of the total population in the Mountains and Hills and half in Tarai as per census of 1991. Due to having Mountains and Hills the cultivated land is limited. It was 2,353,175.00 hectares in 1991. Nearly two-third population are engaged in agricultural occupational and rest population are busy in services and their own economic activities. The population distribution among rural and urban areas is more differential. The literacy rate in rural areas is less than urban areas.)

Nepal, with a total area of 147,181km2 constitutes a part of the central Himalayan mountain system. It has hills and plains of the Indian subcontinent to the south, east and west, and the Tibetan Plateau to the north. Geographically, the country may be divided into three district regions from north to south M Mountain region, the Hill region and the lowland region known as the Tarai. The Tarai, which is an extension of the Gangetic plains of India, forms a low alluvial flatland along the southern border. It includes most of the fertile and forest areas of the country.

Nepal is one of the poorest countries in the world. Although the planned development activities are being carried out in Nepal during the last four decades about half of it's population still live in absolute poverty. The livelihood of more than 90% of Nepal's population depends on agriculture despite the fact that two-third of Nepal's Lands are hilly and mountainous. Regardless of the government's top priority on the agriculture sector, the living standard of rural poor people could not be improved in the past mainly because of insufficient rural infrastructure such as health services, education and community buildings. The basic f facilities such as health, services, education and communication are also not within the reach of poor rural infrastructure such as roads, mule trails, local trails, bridges, Culverts, irrigation schemes, river training works, drinking water supply schemes, structure for solid waste management and others.

Nepal is underdeveloped country and it has dual economy as rural and urban economy. It is already mentioned that ion Nepal most of the population is living in rural areas. In the rural sector modern technology is not introduced. It means the method they adopt is traditional and their main occupation is agriculture. There is lack of economic infrastructure and lack of opportunities, which creates mass poverty. In the rural areas, poverty, illness, unemployment and literacy are the common phenomenon. On the other hand the urban sector, where the few percentage of population live there is some opportunities to work and modernization has taken place. The magnitude of poverty and literacy among the rural people is greater than the urban people. Again, there is difference in health status between the rural and urban sector. So development of Nepal mainly depends on the development of the rural areas.

After the revolutionary political change of 1951 in the highly underdeveloped socio-economic conditions. Consequently, different models of rural development have been experienced. These approaches of rural development can be classified into four categories and phases.

Tribhuvan Village Development Programme (1952-1960)

Panchayat Development Programme (1960-1970)

Sectoral Development Programme 1970 -1975

Integrated Rural Development Programme from 1975

As during the period of 1952—1960, Tribhuwan village development programmed was launched and this programmed served in these sectors for the community development. First, Nucleus Development Areas were identified where the infrastructure facilities to be provided. Second, the Dehat (Rural) Development Areas where in addition to the nucleus activities other provision such as improved seeds. And fertilizer, horticulture and live stock development, basic, social services (Primary School, First Aids Kits and Drinking Water) to be provided were defined. Third the intensive level called Village Development where scientific farming and techniques

extension of health and maternity services, cottage industries and co-operatives were to be provided.

Similarly, during Panchayat Development Programme (1060-1970) two important policy announcement were made with implications for rural development. First, the idea of Co-operative Development Bank was conceived and then establishment of this bank was to institutionalize the rural credit system through village co-operative. Secondly, the land reform program of 1964 was launched for structural change on land.

Likely, during the forth plan period (1970-75) few other developments with rural development implications took place. As a follow up to the recommendations of the Administration Reform Commission, 1968 the local act 1971 was promulgated, replacing the local administration act 1965. It's aim to sharing power with local institution for

- Mobilization of local resources for economic development
- Growth of the local leadership
- Democratization of administration.

Lastly, the five year plan was different in many aspects from the preceding plans. First it de-emphasized the investment in infrastructure and accorded topmost priority to the agriculture sector. Secondly, it put higher investment weight age on local development through Panchayat sector against the nominal concern of the forth plan in this area. Third, it unequivocally advocated "People Oriented" strategy in clear terms. It made the announcement of integrated rural Development Project

Road building started in Nepal with the Indian Army assistance to construct border at Raxual. After the construction of Tribhuvan Rajpath in 1970 linking Kathmandu and the Indian border at Raxaul. After the construction of this road various other highways were started to build since the sixties with the assistance of other countries mainly the India, China, USA, UK, Switzerland and USSR. With great enthusiasm of local community initiative after seventies many district roads were also built under the political drive of 'Back to the Village National Campaign'. Road was constructed from Tumlingtar airport to Khandbari and vehicles were also operated but closed

immediately. A road was constructed and a jeep was taken to Mangalsen, Acham. Likewise many other roads were built without considering the technical aspect. All of these roads were closed due to very high gradient. District and village roads construction was continued in various part of the country. Many of these roads were started with the order of Zonal Commissioner and the CDOs. But these roads caused damaged to hill slope and could not sustain.shrestha and Mallik (1994) described the experience of Green Roads Concept applied in Dhading and advocated for the alternative strategy for hill road needed for environmentally sound and sustainable development.

Green road concept is an approach which refers to an environmentally Sound. Affordable, participatory and technically appropriate and a labor based rural road construction and maintenance methodology. The main feature of green road concept is the process of planning, implementation, operation and maintenance. Other feature of green road concept is preservation of the fragile mountain and environment More than 83% of Nepalese territory lies in hill and mountains. Geologically it is very fragile and relatively. The geological process is still active in the Himalayan region. In this context, it is a big challenge to construct structures without disturbing the natural slopes and vegetation More than 83% of Nepalese territory lies in hill and mountains. Geologically it is very fragile and relatively. The geological process is still active in the Himalayan region. In this context, it is a big challenge to construct structures without disturbing the natural slopes and vegetation More than 83% of Nepalese territory lies in hill and mountains. Geologically it is very fragile and relatively. The geological process is still active in the Himalayan region. In this context, it is a big challenge to construct structures without disturbing the natural slopes and vegetation More than 83% of Nepalese territory lies in hill and mountains. Geologically it is very fragile and relatively. The geological process is still active in the Himalayan region. In this context, it is a big challenge to construct structures without disturbing the natural slopes and vegetation. More than 83% of Nepalese territory lies in hill and mountains. Geologically it is very fragile and relatively. The geological process is still active in the Himalayan region. In this context, it is a big challenge to construct structures without disturbing the natural slopes and vegetation. Utilizing the green road concept, rural roads can be constructed by integrating into the environment and not disturbing the natural slopes.

Green Roads play an important role in the rural development of Nepal; because Nepal's three forth lands are covered with Hill and Mountains. Most of the Nepal's populations are within the range of absolute poverty and living in rural areas. So it]s a challenge to improve the standard of Nepali people through the rural infrastructure development. For the development of any country the development of rural community is the most important and for this the participation of rural people plays an important role. On the other hands, within the limits of infrastructure development the development of roads facilities is the first sign of development indicator. But the constructed road should be environmental-friendly, low-cost, low-volume, fair weather earthen road. Thus Green Roads are the best one. Which contribute in development for rural upgrading?

The concept of rural development started at the end of 1940, during this period the development programs were conducted through the medium of community development. Many others developed and underdeveloped countries implemented the concept of community development after the implementation in America. In Nepal, Tribhuwan Village development programme has been implemented after the democracy of 1950. After this many rural development programs have been conducted by the different agencies. The rural development programs believe that poverty is a vicious circle that is difficult for an individual to break alone.

Rural Development Program supports the target group households in the identification and promotion of suitable income generating activities on the basis of their potential and comparative advantage. The aim is to increase household incomes by creating opportunities for self-employment much accepted intervention of the rural development program. Creation of temporary employment opportunities not only directly benefits the target beneficiaries but also helps to develop skills at the local level (from RDP Report).

Rural development is intended to reduce poverty and inequality. A strategy for rural development must include construction of infrastructure such as roads, irrigation, water supply etc. Works, introduction of new production, technology, creation of new types of institution and organizations.

This study concerns to evaluate rural development with the help of human development must include construction of infrastructure such as government politics, social and economic structure of the society, natural resources and cultural history.

Considering the multidimensional impacts of the green roads in rural development, this research conducts to address some common issues in this regard. Hence, the study possesses some important features. Firstly, this is a study of particular Green Road Constructed to use of an environment-friendly and maintenance technology that preserves the natural environment. It is a case study of Green Road in Katmandu district, whose total length 23km. Selection of this road has been made with the intensions of exploring the specific impact for the development in rural areas among other areas of same district. Broadly speaking, complete impacts of Green Road on rural development should include.

1. The policy should focus on man and his environment.
2. The appropriate technology should be constituted for rural development.
3. The building up of infrastructure is necessary for mobilization and management of resources.
4. The Programmed should be targeted to the decentralization and self-reliance.
5. The Programmed should represent the average characteristics of the rest Green Road of the development region and the country as a whole.
6. The introduction of Green Roads in any rural areas should effects on the occupation of the related rural people.

1.2 Statement of the Problem

Hill slopes in mountains of Nepal are young, active and fragile. Any types of development activities, which disturb the hill slopes, need to be handled carefully. Generally conventional road building system does not include the strategy or preserving mountain environment. Therefore road construction in mountain has caused considerable acceleration of soil erosion during monsoon every year. It has resulted in negative and disastrous effect of development and created new problems by losing agricultural land, vegetation and forests.

Topography and landform of Nepal is unique with its altitude variation in short distance. The fragile geological and mountains terrain of Nepal give rise to natural

hazards likes landslides, soil erosion, sedimentation etc. Rainfall pattern also varies extremely in Nepal. More than 80% annual rainfall takes place within four months of monsoon period. Rest of eight months has very little rain of about 20% annual rainfall. Environmental degradation is accelerated by human intervention for physical infrastructure development and construction activities.

Road building is gaining popularity in Nepal. Construction of roads has become the immediate priority in all level of government bodies-central, districts and village level. But, the recent policy is to focus more on Local Road Network (LRN) to rural development. Budget allocation in the road sector is high compared to other infrastructure sectors. According to publication of DOLIDAR, four billion rupees have been invested every year for the local infrastructure, in which 60% of the amount is invested for the construction of rural roads only.

The term Green Roads arose in the national debate following the popular urge to build roads in more environmentally friendly ways and to allocate more resources to local efforts to build rural roads that serve remote communities. At the same time in Nepal, the trend towards democratization has resulted in a strong popular demand for more programs aimed at opening-up the relatively densely populated, through isolated and therefore more disadvantaged mid hills regions of the country. Democratization or the local involvement of people in decision making has resulted in the need to consider poverty reduction through employment generation activities as well. Green roads respond to this sentiment as its technology is labor based.

In order to access impacts of roads in rural development the different researchers in different part of the country have carried out various studies. This study have been concluded the impacts of Green Road in rural development and impact assessment on rural activities , socio-economic activities, income employment , health education etc. Similarly, at the same time I try to mention the environment condition, such as air pollution, noise pollution depletion of natural resources, loss of bio-diversity etc.

This study further assesses various dimensions such as decision-making implementation and benefits sharing, employment etc. Impact of user group. Fundamentally, this research assesses people participation in various dimensions

based on rural and socio-cultural background. More specifically this study will be concentrated on the following problems:

1. Whether the emphasis on the man and his environment had been designed in policies and programs.
2. Whether this program has been formulated in direct direction?
3. Whether the impacts of green road in rural development will meet the socio-cultural and economic conditions.
4. Will really the road construction in rural areas will assist the rural people for their economic activities?
5. What is the socio-economic condition of rural area's people?
6. Whether the implemented program will effect on the health, education, employment and other facilities?

1.3 Objectives of the Study

The general objectives of the study are to explore the social, economical environmental and physical factors, which affect the Green Road and its impact on resident of Dhading district since 10 years. To investigate how roads effects on rural people in his life survival and helps in rural development. Especially this study focuses on the following objectives.

1. To explore the change about by green road in the demographic status of the people in study area.
2. To measure the impact of green road on poor social status of rural people in study area after the completion of road construction.
3. To measure the impact of green road on economic status of rural people in study area after the completion of road construction.
4. To study the impact of green road on environment in the study area.

1.4 Significance & Rational of the Study

This study which basically focuses on the impacts of Green Road in Katmandu district and their effects on rural development can be justified by several points. Theoretically the study can be justified, as when several development program has been run down in Katmandu district whether it may be in a sector of rural Socio-

economic Activities , income employment, livestock, rural Water supply and sanitation, Education Health, Road or any sector. Such infrastructure development may have fruitful result somewhere. But increment of the road length in any district can be a best result for the overall development. Especially for overall district, roads are the main gates. It opens the door of development. But green roads are such types of infrastructure development, which is more beneficial to the poor country like Nepal. Because it is a low cost road at the same time save the environmental degradation. The owners of such types of roads are the rural people itself.

They participate even from feasibility study to final stage of road construction. Its impacts may be in economic, social environmental and also in demographic sector. In our country millions of people are resides in rural areas and their economic progress depend upon the construction of rural road network. It helps to understand some of the ground realities of Nepalese people especially who are living in village and their socio-culture life, where in the long term teamwork can be conducted through the people's participation approaches. The analysis reflects that majority of rural poor people are facing the problems like low quality of land fertility, problem of irrigation, insecticides, fertilizers, income generating activities etc.

So through the development of rural area the development of any nation can be done. The development of infrastructure at rural level is the Backbone of any country. Therefore, we can say that the construction of Green Roads in any rural areas impacts on the rural people and help in rural development. Hence result of this study may:

1. Provide substantial knowledge about the concept of Green Road and rural development, which is a tangible input to approaches based on people participation development program..
2. Provide insight to planner and policy-makers to design and formulate relativistic policies for the rural development in future.
3. Help to forecast and evaluate the effective and impacts of environment and natural resources management being implemented in rural development.
4. Helpful to other researchers who like to conducts similar research in future.
5. Provide insight to concerned institution and individual who are interested in the field of rural community development.

1.5 Organizational Pattern of the Study

This study follows the logic as the study of a particular Green Road Constructed in a rural area of Nepal, which describes the impacts of Green road in rural development with different issues like socio-economically, demographically and environmental etc.

This dissertation has been organized into six chapters, namely, introduction, literature review, description of the Study area, Research method, data analysis and major findings and conclusion and recommendation.

Chapter one presents a brief introduction of the study highlighting the research problem and objectives of the study. It also shows the background with the relation between green road and rural development. Like this the first chapter describes about the rational of the study and organizational pattern of the study.

Chapter two describes about the general overview and historical overview of green road, which are practicing in Nepal. General overview of some implemented rural projects has been described in this chapter. Chapter two reviews studies and highlights on the theoretical basis of present road construction model as well as historical overviews. This chapter has been categorized in subcategories, which review the green road construction in multidimensional principle with assessment of future road length in Nepal.This chapter also shows the conceptual framework of the study.

Chapter three describes the brief introduction about the study area, district in which this area is located and related district where this road also shows the natural represented physical settings and socio-cultural setting of the study area.

Chapter four gives the method of the study in which research design, nature of data and its collection method has been shown. This chapter also shows that how the household has sampled and tools and techniques for data collection.

Chapter five describes about the analysis and interpretation of data. All the collected data and information from the study area have been categorized and analyzed with different indicators of development. After analyzing the data of different indicators major findings have been presented in tabulated and graphical form. The last and the sixth chapter deals with summary, conclusion and recommendations.

CHAPTER - II

REVIEW OF LITERATURE

2.1 General Overview

Nepal is a small Himalayan country with 3912 village Development Committees (VDCs) And 58 Municipalities. Almost all villages and municipalities are rural in character. The livelihood of more than 90% of population in Nepal depends on agriculture. Different studies have shown that about 45% of its population is still in absolute poverty. In this connection the development of nation is impossible without infrastructure development in rural areas and change in agriculture sides. The living standards of rural poor people could not be improved in the past although the government had given the top priority to the agriculture sector. The main reason for this is the lack of rural infrastructure development and agriculture roads. The rural roads which can also be named as agriculture roads link farms to market centers or to nearby strategic road heads. So they are more important in this regard.

Worldwide, Nepal is a reputed tourist destination for maintaining and trekking. The prospect of trekking may attract a tourist once in a lifetime, for the majority of the rural population of Nepal, it is daily time consuming burden.

The Road Classification (second Revision) 2050 of DoR provides five classes of roads in Nepal. These are:

1. National highways (NH): The road connecting NH to Regional Headquarters are classified as National Highway. These serve directly the greater portion of the longer distance travel, provide consistently higher level of service, and bear the inter-community mobility. These roads are the main arterial routes passing through the length and breadth of the country as a whole.
2. Feeder Roads (FR): Feeder roads are important road of a more localized nature than National Highways. These are further classified into Major FR and Minor FR.
3. District Roads (DR) District Roads are defined as those roads within the district serve primarily by providing access to abutting land carrying little or no through movement. This road gives access to one or more village to the nearest market or higher classes of roads.

4. Urban Roads (UR): Urban roads within the urban limit of municipality boundary, except for the above classes, passing through the city. These roads provide access to abutting residential, business and industrial places within the municipalities.
5. Village roads (VR): Village roads include short non-through roads linking single village directly to the roads district roads (Nepal Road Statistics, 2002).

Rural Green Roads obviously falls within the classification of DoRs. However the green road considers "road ownership" as the major element for classification. As road ownership actually defines the authority, and the roles and responsibilities of the road, undertaking agency for maintenance works. Rural green roads are classified according to their functions under the District Roads (DR) and Village Roads (VR).

For a country about 147000sqkm, with dimensions of roughly 900 km by 160km and an estimated population of 22 million, Nepal's road density is quite small, 9kmper 100 sq km with coverage of about 6km per 10,000 people. Nepal is hence one of the least accessible countries in South Asia (GTZ, 1999)

Already by 1959, Tony Hagen, a Swiss geologist who had walked several times across the remote areas of Nepal, mentioned in his report to the United Nations that the poor transport system was one of the main bottlenecks that would slow down rural development. His proposal was to improve the accessibility of rural communities by concentrating on upgrading foot trials and suspension bridges across major streams. In the longer term, he foresaw the need to construct both motor able roads and ropeways, and to improve air services (GTZ, 1999).

Since 1959, considerable development of the national level highway system has occurred. Along the southern terai, an approximately 1000km long blacktopped double-lane all-weather road from the eastern boarder to the Far Western regions has been constructed. This main east-west link has been connected with the capital Kathmandu. India has been linked with Chin, via Kathmandu, across the Himalayan through Tibet. Most secondary cities in the Terai and many in the mid-mountains are also linked with this system.

Most rural settlements in the flat Terai have already a seasonal motor able access for trucks or tractor-trailers during the dry winter season. A wide network of motor able roads and tracks exists which is assumed to be several thousands kilometers in addition, but has never been statically recorded) GTZ, 1999).

But, rural mountain areas, in contrast, still remain quite remote. In the past, several major Trans-Himalayan trade routes consisting of major foot trials existed for seasonal barter trade between India, Nepal and Tibet. . With the occupation of Tibet by the Chinese, this trade has stopped and stopped and this trade network has fallen into disuse. A majority of Nepal's population still walks for hours and days to reach the nearest service center to meet their basic needs.

Besides the extensive efforts to construct a basic highway network, several unique rural road construction efforts have emerged from a series of integrated regional rural development programmes (IRDPS) in Nepal's mid-hills during the last two decades. The German and Swiss governments have technically and financially supported these rural road Programmes. Roads often became a backbone of these development efforts, despite the fact that they were not in the initial focus of the project.

During the late 1970s, the lamosangu-jiri Project began as one of the first rural road projects within the context of the Integrated Hill Development Project (IHDP) in Sindhupalchokand Dolkha Districts. Its design paid particular attention to having a minimal negative environmental impact (GTZ, 1999).

Local Communities (VDCs, NGOs, CBOs, committees as well as DDCs are supported in their decision making process in planning their road and trial networks as per HMGN's decentralized policy and implementation efforts and they shall contribute to the optimum extent using their central level budgets and local funds (Mayer et al,1999). Green Road is one characterized by the construction methodsdescribed by by the Green Roads concept. It is a low cost and low volume road. They are generally well intregrated into the environment and often can hardly be seen from distance greater emphasis is given to the selection of a smooth longitudinal alignment that allows for progressive upgrading as traffic increases (Meyar et al, 1999).

2.2 Historical Review

The history of road Construction in Nepal is closely linked with international assistance since the very beginning, which began only about four decades ago. It started in 1953with the construction of the Tribhuwan Rajpath by the Indian army linking the Indian Boarder with Nepal's capital city Kathmandu. About eleven further major north-south trunks followed from the 1960's onwards with support of the Chinese, Indian, American, Swiss and British Governments. The construction of the Mahendra Rajmarg (East-West Highway) stretching over 1000km in the flat Terai was started in the late 60'ies linking for the first time East and west Nepal with the Central Part in 1980, the National Level highway and feeder Road network consisted of about 4740km of roads and is managed by the department of Roads. His Majesty Government of Nepal, supported by the main donor agencies, has given considerable importance to the develop a national –level road network linking district headquarters and other economically important areas.

Under increased political pressure of the parliament, in the early 1990s, the government fall a commitment to connect all 75 districts with motor able Feeder roads (in view of social justice and fulfillment of the basic needs). A growing concern from bilateral donors as well as multilateral loan partners is that the rate of return on road transport investment is significantly lower in Nepal than in other similar countries. Some Major reasons are the increased construction and maintenance costs partly due to the difficult mountain topography and the monsoon. Solutions are required to meet both concerns of providing increased access to the still remote rural areas as well as reducing the unit of road construction, rehabilitation and maintenance.

In general, roads in Nepal have been built without sufficient conservation of the fragile Himalayan mountain ecosystem and attention to environmental aspects. Through donor supported roads were built already in the early 1980's with environmental protection measures, they have been considered as to expensive for replication in a wider scale. The construction of the local rural roads through local governments with people's participation has been practiced already since about two decades. Self help construction is rapidly increasing since the democratization and allocation of funds to each VDC and implementation through user groups in popular political movements build our village ourselves. Such rural roads are cheap, but are

mostly built without adequate planning, lack of technical support and construction supervision. Environment aspects have been considered during construction. These roads are often not in operation after one or two rainy seasons.

Based on the first experiences of a more conservation-oriented road construction of the Swiss supported Lamosanghu –Jiri Road in the early 1980's, a new type of mountain road construction focusing on environmental-friendly ways was gradually developed that was suitable for the Nepal mid-mountains. The approach was further developed from 1985 onwards by rehabilitating defunct tracs and building a new type of rural low-cost, low-volume roads using participatory and labor based methods in the Palpa districts. The local road improvement programme (LRIP) was implemented by the district with the Tinau watershed project/ laterPDP with technical and financial assistances of Helvetas and GTZ.

With some further adjustments, the new rural road construction approach was transferred to Dhading in the frame of Dhading Development Project (DDP). With further modifications the then called "Green Road Concept" was introduced in 1988in GTZ supported DDP along two roads and later on replicated and improved in the Regional Rural development. Programs of Gorkha, Lamjung and Sankhuwasabha. Since the mid 1990's, the rural community infrastructure Work Program (RCIW) supported by UN World food Program and with technical support of GTZ adopted the concept in a wider number of local roads on over 20 districts. More than 300 km of Green Roads has been built in various districts and currently considerable amounts are under construction (GTZ, 1999).

2.3 Green Road Approach in Nepal

Nepal is predominantly a mountainous country with the world's highest peaks. Over 75% of its landmass comprises hills and mountain ranges spreading to the North-South within a horizontal distance of 200km between 50m to over 8,800m above sea level. Expanding about 900 km from East to West, it is occupying the central position of the Himalayas. The Himalayas of Nepal provides an extraordinary refuse to an extremely rich and unique biological as well as ethnic and religious cultural diversity.

Different ethnic groups varying from Indo-African to Tibeto-Burmess background settled side by side in different types of settlements mainly governed by a small kingdom, often in isolation divided by higher mountain ranges. They lived mainly based on a self-sufficient agricultural production complimented by barter trade. Some populations like the Newars were successfully involved as international traders of salt against grains between the Tibetan Plateau and the Indian subcontinent and could accumulate substantial wealth. During the last 50 years, however the traditional continental trade pattern changed gradually and new trading patterns shifted towards the new Himalayas. In the meantime the mountain population has been growing substantially, and many people are bound to seasonally or fully migrated southwards to the urban growth centers. The isolation and strenuous and time consuming pedestrian access to goods and services separated the rural population from participating in the economic development of Nepal taking place mainly in the main growth centers of Nepal.

The Green Road Concept emerged in the Nepal Himalayas from lessons learnt out of a series of initial rural mountain road projects starting in the early 1970's. They all were challenged by the relatively strong dynamics of the geology regarding road foundation issues and a mostly strong monsoon climate with the wide range of minimal to maximal rainfall patterns influencing the natural vegetation cover acting as a protective skin against soil erosion. The population used to organize their life in a self sufficient and sustainable manner and by community based management of public infrastructure in order to cope with the harsh environment against the destructive natural forces.

The Green Road Concept has been based on a series of principles characterizing the cultural identity of the mountain populations searching for preference for community-based public works as well as based on the stronger geological dynamics and fragile natural balance. As well as the limited initial financial resources availability at local as well as national level, but with staged up grading options as the growing traffic demands.

Considering the serious shortcomings of the conventional techniques, a new approach for the construction of rural roads has been developed in Nepal. This new Green road" approach is environment friendly participatory in nature. And uses labor-based

technologies. The approach is based on the recognition that is many stakeholders in the promotion of rural roads. Each of them is in a position to many stakeholders in the promotion of rural roads. Each of them is in a position to contribute to road construction in a unique way. While government and prostates as well as people's organization may contribute in terms of planning, designing, financing and management of the road, people would large would contribute through the sharing of indigenous knowledge in terms of local geology's well as by participation in the actual construction activities.

Road construction is not seen as a one –time wage earning opportunity but also as a starting ground for self-help activities. The actual construction technique follows the philosophy of minimum disruption to existing vegetative cover and re-utilization of the excavated materials as construction material. Decentralized implementation employment of local people, local ownership of the road and maintenance obligations, all contribute to the promotion of local capacity-building and self-help efforts. The economics of green road construction is highly favorable in terms of employment generation and utilization of local resources. It is based on the following principles.

1. Participatory democratic Rural Road Network Planning.
2. Adoption of Road Technology adopted to preserve the fragile environmental balance of the mountain.
3. Optimisation of supportive natural processes and avoidance natural forces.
4. Promotion of appropriate Labor based Technologies utilizing a maximum of local human as well as natural resources and reducing the need for imports within cost efficiency in order to generate local income particularly attractive for the poorer population strongly.
5. Optimizing labor-based construction methods to generate local income particularly attractive for the poorer people.
6. Application of performance based work management system paying for completed works based on quality and quantity management.
7. Specifying the future road ownership base on the subsidiary principle at the beginning of the project in order to promote sustainable maintenance development of decision making in protect in planning.

8. Integration of local circumstance into implementation such as adaptation of the work plan with the agricultural slack season, encourage gender equality in decision making and work provision, allow but restrict child labor, gambling and alcoholism.
9. Promotion of local capacity building alongside with the construction implementation works and management in view of future maintenance and rehabilitation works and of other rural road construction projects.
10. In order to optimize the cost/benefit ratio of rural road, the initial road surface standard is generally low –cost, a mix or earth with gravel, and spot gravel or moist section. This is a compromise looking at the low initial traffic volume.
11. The rural road infrastructure financing is supported by pooling resources from local and central governments levels together, accepting local contribution in kind and complement the outstanding input and often technical assistance with donor support.
12. Regular public audit presentations of the expenditure on the construction sites are important tools to ensure financial transparency optimise project cost efficiency and increase the confidence ot the local population or appropriate fund utilization (Meyer, 1999).

The importance of rural roads extends to all aspects of economic and social development or rural communities, including demands for and access to health, education ,information etc. the total need for upgrading and maintenance of rural than conventional equipment based options, that is reduces foreign exchange requirements by some 50-60%, and for the same investment ,creates 2-4 times more employment.

The use of labor-based methods also implies the increased use of associated local resources. These may include locally available materials, tools and equipment, skills and knowledge as well as finance .For example if in certain countries the agriculture sector is flourishing, then it should be possible to tap into and use the tools and equipment produced locally for agriculture, with perhaps some adaptation to make it suitable for use in lobour-based in the infrastructure provision. This reinforces the amount of investment, which remains in the country and often in the locality of the works, and reduces the dependence on costly imports.

2.4 Basic Principles of Green Roads in Nepal

The Green roods approach is a rood building technology that is appropriate for Nepal's fragile mountain topography that aims to be low cost and uses manual labor to generate off-farm employment. Green Road could do so much throughout Nepal to improve the standard of living of local people, and not damage the on environment. A Green Road costs only Rs. 10-12 lakh / km to built, and the benefits go straight to the local people. The Green Road concept aims to:

- Develop rural road and trail networks that reduce transportation costs.
- Use a participatory approach with local authorities and stakeholder communities from the preparation phase onwards, to promote a sense of local road ownership for its operation and maintenance. The beneficiaries make the decisions on the selection of the project, its alignment, labor management, group formation, and resource distribution and utilization.
- Use environment-friendly road construction and maintenance technique that protect the natural environment, its agricultural potential, and its natural resources against excessive erosion.
- Use locally available resources in terms of labour. Material and finances.
- Generate short- term, off-farm employment opportunities especially for local people by using manual labour intensive road construction and maintenance techniques (Klatzel, 1987)

2.5 The Engineering Principles of Green Roads in Nepal

Preventive measures are cheaper than curative ones to reduce the risks of recurring landslides and increased soil and water erosion. Aligning the road along a ridge, especially with a south-west aspect, helps to avoid water drainage problems, avoids exposure to excess moisture and frost, and uses sunlight to keep roads dry. Phased construction, such as gradually increasing the width of the track, avoids having to manage large amounts of excavated materials and allows for the natural compaction of earthwork by monsoon rains. Through a technique called mass balancing, material that has been excavated is used as fill or construction materials. When this is not possible the excavated earth is carefully deposited to minimize damage to forests and fields. Maintaining the vegetation cover reduces soil erosion and bioengineering, the painting of shrubs and trees along the edges of the road helps to stablise the earthen

banks. The roots of the plants help anchor the soil to reduce landslide. The most commonly used plants are Utis (alder), Berberis (berbery), and Katus (cactus). The Utis naturally re-colonies bare ground after landslides or floods. Dispersed water drainage systems avoid the natural destructive forces of collected outward slope to disperse rain water. Roads are usually closed in the monsoon to prevent damage to the road surface. Local technologies and materials are used except for the wire to construct Gabon boxes. The most common local technology is the construction of dry stone walls, without cement, to fill the roadbed. These walls are built by local labors that are skilled at trimming and cutting the rocks. Using local construction materials make Green Roads more economical and sustainable. Road building materials such as excavated stone, chips, soil, and plants are found locally. Most of the tools are also produced locally, as are low-cost intermediate equipment such as wheelbarrows. Blasting is never used because it causes fractures deep in the rocks that later can lead to large landslides. A large fire is built under the rock face to heat the rock. When the workers pour cold water on the hot rock, it usually cracks, and is easier for the workers to manually break apart (Katzel, 1987)

2.6 The Social Principles of Green Roads in Nepal

Promoting local participations opens the way for districts and villages to become more involved in road construction and maintenance. Participatory planning processes are used throughout the planning, preparation, and maintenance phases. Using labor based construction methods generates massive local employment opportunities. The construction of Green roads requires about 12,000 persons per days per kilometers. In addition, road maintenance requires about 200-300 persons days per kilometers. The annual construction period is co-ordinate with the local agricultural slack season so that people are not taken away from agricultural production. Encouraging women to participate in the decision making role of committee contributes to gender balance community development. Women are also able to earn in the construction work, and they are paid the same as men for equal work. Children under sixteen years of age are not allowed to work in the project. Drawing on local knowledge during the field surveys help to identify an alignment based on traditional routs that the local people know well: they know where the soil is soft, slippery or moist and where rock falls are dangerous. Surveys apply simplified and standardized drawing and estimates. Phased construction methods adopt the road construction process to the availability of funds,

labor, and other self-help inputs, and other self-help Compensating laborers based on the amount of work they accomplish, rather than by a fixed daily rate, creates a major incentive for work to progress quickly. Problems do sometimes arise in the distribution.

Decentralizing implementation and decision-making from the initial request phase helps local communities feel ownership of the road and responsible for its maintenance. Clarification or the road ownership by the DDC, VDC, and other public institutions is important to ensure compensation for construction damage, and to develop sustainable maintenance systems. Using participatory planning exercises in the districts builds political consensus from the village up in order to prepare the District Transport Master Plan. "Local Road Co-ordination Committees" pare established to act as mechanism for resolving local disputes. The landowners that provide land for the roads compensating indirectly by higher land values following road construction. Promoting local capacity building and self-help efforts by investing in social mobilization to build local skills and create a local "self-help" attitude. Various levels of training are provided during the construction process and trained local people become a source of local manpower for neighboring road projects, and for later maintenance, and upgrading works. Using collective financing from the central, district, and Village governments and institutions creates the attitude that it is a possible to build and maintain infrastructures with local resources and to generate a sense of local ownership. Public audits make people aware of how the funds are utilized by providing information on project plans, and expenditure. Sustaining maintenance of the roads is in progress by creating a sense of local ownership of the road from the very beginning of the construction. Local committees are encouraged to generate resources for maintenance through savingh/credit groups, the sale of rice sacks, and road user fees. Some districts, such as Dadeldhura have started committees to manage the future maintenance of roads throughout the district (Klatzel, 1987)

2.7 Length of Hill Roads in Nepal

According to the National Plan for Rural Road Maintenance (NPRRM) 2056 of DoLiDAR there was 14,000 km or rural roads in 1998. Rural road network generally comprises of district roads and village roads. His length of the road was 68% of the total length of total road length of Nepal including the strategic roads (National

Highways and Feeder Roads) and urban roads. Rural roads are developed in the districts, which are connected by strategic road network. Strategic Roads and Urban Roads Constitute about 6000 km of length. Thus total length of the road network comprising of all types of roads is 20,600 km in 1998.

There is no considerable increase in the length of strategic and urban roads, however, their quality has been improved from earthen to gravel and gravel to asphalt surface. But within the three-year period, length of rural roads have increased considerably as the local level institutions (DDC, VDC and Communities) are giving top priority in road conastruction while implementing local development works (Shrestha, 2005).

According to the NPRRM 2065 of DoLiDAR, annual increment of road length of rural road network is 5%t This now rural road network is estimated to be more than 16, 000 kilometers.

2.8 Conceptual Framework of the Study

Environment issue in road is gaining concern in Nepal. As a general rule enforced under the Environmental Protection Act 2056, the execution of EIA is required for all the new strategic roads and IEE for all new district and village roads. This rule is followed now for the construction of strategic roads. But this rule is not practiced for the construction of new rural roads being constructed by DDCs and VDCs. Rural road projects funded by donors have very recently started to carry out the IEE. The expansion of infrastructure services is regarded as essential to the development process in Nepal. However, given the fragile mountain ecosystem, if especial measures are not properly design and implemented, projects can result in serious environmental damage, which can in turn led to significant economic losses and the waste of scarce resources. Environmentally unsound construction methods, coupled with underlying unstable geological formations and technically unsound road alignment, have damage the landscaped by exposing large areas of earth and rock to erosion forces, resulting in the subsequent destabilization of mountain slopes. Other localized environmental impacts associated with road construction sided include deforestation, and air and noise pollution.

Physical infrastructure has various types of independent environmental factors namely demographical, economical, and social and others like health and education etc which influences the Green Road construction in rural areas for their development. Sub factors of each factor and diagram of each factor and diagram of conceptual

framework of study has been presented in figure. All the sub factors of economic factor are dependent factors of green Road. By the construction of Green Road in any rural area it directly effect on the dependent factor like change in land value, change in agricultural production, change in marketing dynamic, change in transportation cost, employment opportunities etc.

By the Introduction of Green Road in any rural areas the attraction of Road Side for increase housing construction activities can be seen compare to off-road areas. Construction along the road corridor can be seen high. In general, major construction activities are occurring.

1. In areas that one in the process in being opened up
2. In bazaar areas
3. In areas that previously been less densely populated and developed

There may be rise in land value along roadside corridor. Land value increases tremendously, especially in bazaar areas. By the introduction of access road to any rural areas there may be the change in the thinking about agriculture production. The farmers can use advanced type of machinery, Hence there may be the effect on agriculture production. Cash crop production may be practice to some extent. The road plays a crucial role in promoting a considerable rise in economic development. By providing easier access, large amount of agriculture inputs can be made road has considerable effect on change and trade. Tea stall and other small retail of can be opened at strategic points along the roads and in bazaar areas evolves at some traffic nodes. Looking at the construction activities in the road corridor, as one overall trend a correlation can be seen in shop construction and the respective jeep able person of the road.

Catering business and trade in the road corridor may help the local people so read introduction in rural areas may effect hardly on economic activities and their development strategies. Migration from extreme rural areas can take place to the roadsides. Major economic changes derived through the encroachment of a number of local whole sellers in the areas. Development opportunities grasp quickly. Rural industry or small scale industrial enterprises develop on a nominal basis in the constructed portion of the road, in an around the vicinity of larger settlement. The correlation between the constructions of a rural ad the establishment of rural industries can be seen clearly.

Likewise traffic of volume of a road indicates it's significant with regards to imports/ exports transaction and the mobility of road neighbors. It is indirectly related to the sustainability of a road with regard to long term maintenance. Improvement in access through roads decreased transport cost tremendously. Due to motorized vehicles, expenditures for transportation reduce. Saving due to lower transport cost to consumers and transport induced reduction in retail prices on May goods and commodities can be seen clearly. A wider variety of goods and more commodities can be made available at different locations along the road.

There may be direct impact through the provision of temporary employment possibilities during the period of road construction. Road neighbors are employed mostly as labors, naikes and supervisors along with some as technical staffs, like Black Smith Mechanics, Storekeepers and Health workers. One of the principles of Green Road is to keep the road investment capital in the local community by utilizing only locally, similarly impacts of green road in social dimensions can be seen clearly. It effect on many dimensions likewise the living standard to those living near the roads corridor makes positive, even enthusiastic about the efforts of the roads on their lives.

Improvement of living condition increases number of metal or tile roofs even frame structure R=C=C building in the road corridor. Either through construction of new houses or through construction of new houses or through renovation of prior thatched roof houses. As road laborers and road neighbor spent much of their income on food and consumer goods. Food sufficiency in the households improves slightly and a qualitative change in the food consumption pattern occurs. all road neighbors regard mobility as a major benefit. Literacy rate comparatively increases on the road corridor than in off-road areas. Thus effect resulted from the construction of additional schools along the road. It can be stated that the existence of the road effects the establishment of additional education faculties.

Due to the existence of road the health situation improve gradually. As increased accessibility to health stations, the improved knowledge gains on hygiene and primary health care provided through different organizations in the road corridor, additionally through the increase of balanced food, through the consumption of more vegetation. Social norms and values change especially with regard to social differences. During construction period, the employed labors working together in fixed gangs over a long period of time helped to develop community spirit and efficiency among the labors.

The study has employed the following conceptual framework:

The meaning of modern development is not only the growth of the facilities and infrastructures as well as economy but also the consideration of human capabilities and improvement in socio-economic sectors.

- The development can not be made fruitful without empowering and encouraging rural people, underprivileged groups and their traditional skills.
- The process of environment-friendly road construction through local people participation is a bottom-up approach in rural area, which is a best practice for sustainable development. Demographic factor plays much more effect on the rural development participation of women shows the equity contribution in rural development work.

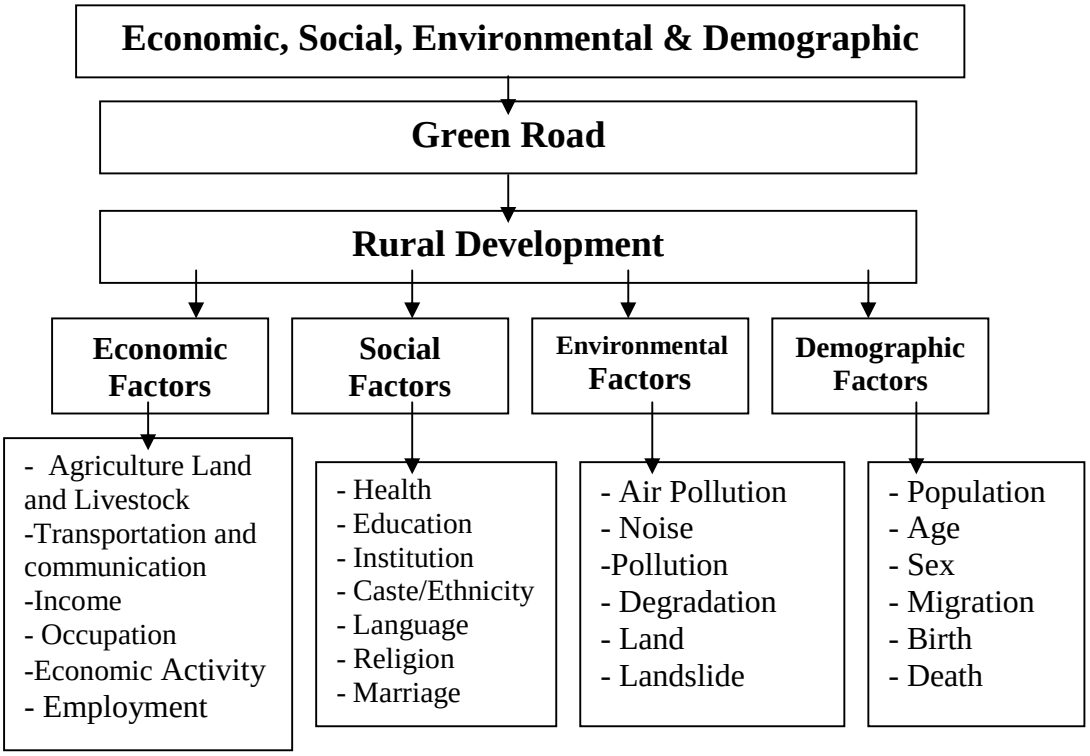

Figure 1: Conceptual Framework for the Study

CHAPTER - III

RESEARCH METHODS

3.1 Selection of the Study Area

The research site is purposively selected from Katmandu district, which represents central Hill region. Newars are as original inhabitant of the district. Katmandu is the kingdom of country and it is highly developed than any other district has got first priority in the development of infrastructures, trade and commodity production system. Tamang and Bahun-Chhetri are the original inhabitants of the study area and the people living in such area are the beneficiaries of such road. This study will beconducted in Bhimdhunga-Lamidanda road in Dhading district is 23km long particularly, the road has highly impacted in that rural area is selected for the study. The selected road is very close to Kathmandu valley and no such type of study has been done till now. Selection of this road has been made with the intention of exploring the specific impact for the development in rural areas among other areas of same district. This Green Road will suppose to represent the average characteristics of the rest Green Road of the development region and the country as a whole. The study will be conducted in Bhimdhunga-Lamidanda road in dhading district is 23km long. Particularly, this road has highly impacted in that rural area is selected for the study.

3.2 Research Design

Descriptive and exploratory research design was used in the study. The major purpose of the descriptive research design is describing the impact of Green Road in rural development. It tries to explore new things of socio-economic activities, demographic and environmental factor which have been affected the community in the study area. As per nature of the research, data related with social and economical phenomenon, demographic calculation, and environmental factors etc. will be collected based on existing situation.

Similarly, the imparted impacts of constructed road, before and after construction, both socially and economically have been compared with the help of exploratory and analytical research. The socio-economic information then and now has been collected through longitudinal research design.

3.3 Nature and Sources of Data

Primary data were collected with interview Schedule, Observation, Case Study and secondary data were collected through information from various sources, which include published and unpublished documentary sources; books, booklets, magazines, newspapers, articles, thesis reports etc. Secondary data has also been generated from fragmentary sources, project document, village and district profiles, census data, routine national/ regional statistics, published book, journals, research reports etc. were consulted, Unpublished materials such as Green Roads construction guidelines, database and websites have been used as per need of the study. The collected data and fact are particularly in two natures are qualitative and quantitative data, which helped to fulfill the requirement of the study, included as a major part to achieving its all the objectives of the dissertation.

3.4 The Universe and Sampling

This road starts form Bhimdhunga (Kathmandu district) and ends at Lamidanda (Dhadingdistrct). The total length of road is 23 km. Out of this mentioned lengh only 3 Km is falling in Bhimdhunga VDC of Kathmandu district. The study was conducted in four wards of Bhimdhunga VDC of Kathmandu district. The priority for selection had been made on the basis of ward those touching the B-L road. Therefore, among the nine wards of Bhimdhunga VDC, ward number 4, ward number 6, ward number 3 and ward number 1 had been selected as a sample for study. The selection of the informants for study was based on socio-economic consideration following random as well as purposive sampling procedure. These informants were selected under different criteria that is, occupational change, change in living standards, impacts of road etc.

Out of 74 households in ward number 1 only eleven households are situated along the road. As there are 99 households in ward number 3, but only fourteen households has been selected for sampling. Same like above 46 households are present in ward number 6, but only ten households have been selected. Similarly, there are 50 households in ward number 4, but only fifteen households have been selected. Therefore, out of 269 households in above mentioned four wards of Bhimdhunga VDC of Kathmandu district only 50 households have been sampled as a respondent for study. These have been sampled randomly and preference has been given to those

households which are touched with road. On the basis of following criteria these households have been sampled as

- Purposively identified VDC, wards and number of households.
- Conveniently sampled household within the road corridor which are touched with B-L road were selected as a respondent.
- Any one can be respondent, however less than 30 year old are not accepted as a respondent.

Locational analysis of all the existing Green road construction (well, constructed well, gravel and) in Bhimdhunga-Lamidanda will be done by GIS. Their locations will be verified by compiled and analyzed in different tabular forms using will be prepared by digital maps published government of Nepal. For this purpose, The green road quality, condition, demand, utilization of existing road will be observed in the field work by different test, check list survey, key informants' survey.

The Primary information of this study will be drawn from Key informants' interviews, Informal discussions using checklist, Group Discussion in local level. Information will be also consulted/ collected through different government and Non-government office, Institutions, ICIMOD, Development Agencies and the prestige person of the Village Development Committee.

3.5 Data Collection Techniques or Methodology of Research

The term case study usually refers to a fairly intensive examination of single unit. A unit may be a person or a small group of people or a single company. Case studies involve measuring, looking what is there and how it got there (historical approach). Its enable us to explore, unravel and understand problems, issues and relationship in a particular situation.

The research is done or Data collection technique and tools are described below.

a. Interview Schedule
b. Key Informant Interview
c. Group Discussion
d. Observation

3.5.1 Interview Schedule

A set of questions were prepared and then directly visiting to the participants these questions had been asked and noted what they responded. The group members were selected randomly ascending to the above sampling size and the actual reflections of the participants were focused on the table, which deals the impact of the Green Road in rural development.

3.5.2 Key Informant Interview

This technique is conducted to collect primary data. Key informants were interviewed semi-structurally. By applying this tool, the information about socio-economic condition, existing condition and impacts in society were collected. Other information provided by the villagers was verified through key informants 'interview. The respondents were asked based on checklist developed. Altogether 5 respondents were interviewed. Interview was held with the community key personality such as local technicians, leaders for knowing principle issues such as historical background, people's participation, benefit sharing system etc. Answers received from interviews were used for background information and for triangulation of data collected from other sources.

3.5.3 Group Discussion

A Focus group discussion with local people was conducted at community level. During discussion, some qualitative data on attitude and perception of local people towards need of road in rural area, road impact on socio-economic sector, support the community of participate in various function, constructed road in rural area really helping the rural people etc were collected. The discussion was conducted based on semi-structured questionnaire developed. Data/information received from discussion was used in triangulation of the data received from other sources.

3.5.4 Observation

Observation was one of the primary methods used in the acquiring about the socio-economic condition of the study area. During the study period observation was carried-out. Observation was based on checklist developed. Generally, participants observation was made through transect walk of respective road, local user people meeting observation, community visit etc. Information received from participants observations were used for the triangulation of received from other sources.

3.6 Data Interpretation and Analysis

The varieties of approaches-including ethnography, narrative analysis, discourse analysis, and textual analysis-correspond to different types of data, disciplinary traditions, objectives and philosophical orientations (1bid). In my study, the collected data have been edited, coded, tabulated and checked to remove possible errors during the fieldwork evaluation. I then tried to match the responses of each of the respondents with the questions and the topic discussed during the interview, I relate this to my objectives of the study and research questions. This helped me to analyze my data appropriately.

Basically, quantitative data have been categorized and presented as per need of the study. In order to analyse the data, simple statistical tools such as frequency, percentage, average, correlation analysis has been used. Likewise, mainly Microsoft Word and Microsoft Excel have been used as computer facilities. Interpretations have been made on the basis of results, which has assisted by qualitative data/ information available from both primary and secondary sources.

3.7 Limitation of the study

This study has inherited some inevitable limitation from the beginning. Occurrence of limitations persists up to data collection, data processing and completion of thesis report. Obviously, such limitations will influence to the coverage, magnitude and the qualities of research.

- The study was conducted with limited resources that automatically narrow-down the coverage of study. A study conducted in such a limited period hardly draws the detail and actual information related to cultural and behavioral aspects.
- Due to present condition of country and security point of view it is not easy to spend many days and frequently visit the study area for the data collection.
- Rural people and local authorities are the major respondents of this study. Most of local/rural people are not educated. That is why it is very difficult to carry out the study and collect required information. Likewise, because of a new field it is also a very difficult to find out the records related to road construction from DDCs and VDCs in community level.

3.8 Operational Meaning of Words

Aama samuha: Group of married women, who has given the birth of her children.

Agriculture roads: Roads which link farms to market centers or to nearby strategic road heads

Bada Hakim: A person senior in post

Dehat: Area within the territory of any country that is located in plane area.

Farmer: One who resides in a rural area and cultivates that farmland

Green Road: Environment friendly road

Household: A group of individuals related to each other by blood

llaka: Area with the boundary

Kuwa: Traditional gravity flow of water

Khola: Small River especially flow of water

Kasta Mandap : Beautiful shade or cover

Kund: small pond

Local People: Indivisual livings with in the same political boundary.

Mandap: Beautiful shade or cover

Naike : Leader of any individual group

Panchayat: Political boundry for any Village Development Committees

Rajpath: National Highway

Rural People: Individuals living in rural area.

Study area: Certain limited area with boundary selected for study

Ward: Certain political boundary in which individuals resides

CHAPTER – IV

SETTING OF THE STUDY AREA

4.1 Introduction to Bhimdhunga-Lamidanda Road

This chapter is designed to introduce the study area. In the first section, a brief geographical and socio economic description of Nepal is presented. Information about location, population and introduction about Bhimdunga-Lamidanda road has been presented here. In the other section, the short description of Dhading and Kathmandu district has been given. The specific study area, Bhimdunga VDC of Kathmandu district has also been introduced in the last section of this chapter. This section presents the geographical situation of the study area.

Bhimdunga-Lamidanda road (BLR) was constructed with the support of DDP/GTZ. The road construction was started in 1988 and continued up to 1996. This road was started as apilot green road to test the suitability of green road Technology in Nepal. Due to this reason, budzet allocation in first three years was minimal and the construction progress was slow. Basically it was an action research. Only after successful results of early years, the road construction was progressed in full fledge.

Bhimdunga-Lamidanda road connects a high potential agricultural pocket of southeastern Dhading district. Besides providing transportation facilities, it provides market access (viz. Kathmandu) to the agricultural products of this area. This is why values and quantity of total export (farm products) made through this road is quite higher than import of provisional goods and construction materials made through this road.

This road starts from Bhimdunga Bazar in Kathmandu district and joints the settlements on Lamidanda ridge in Dhading district. Chhatradeurali, jiwanpur, Kewalpur and Goganpani are the VDCs getting access from this road. This is the ridge road situated between two river valleys viz. Mahesh river Valley and Kolpu RiverValley. Kolpu River froms the border between Dhading and Nuwakot VDC. Thus, this road provides access to few of Nuwakot district as well.

After completion of this road a significant socio-economic impact has been seen to the local communities in the road corridor. Agricultural production has increased

many times and new income opportunities have been created for the local people. The road construction program itself created short-term employment opportunities as all the road workers were the local people. Road workers used this short-term income opportunity for ascertaining long-term endeavours such as improved farming, business, shops etc. The workers also got technical and construction skills during the road construction by means of various training provided by the road programe. They are using these skills in other construction works and have added employment opportunity.

Table 4.1: Feature of Bhimdunga-Lamidanda Road

S.N	Description	Features of Road	Remarks
1	Road work started on	April,1988	
2	Construction work completed on	December 1996	
3	VDCs on road corridor	Bhimdunga	Kathmandu district
		Chhatredeurali,Jiwanpur, Kewalpur, and Goganpani	Dhading District
4	Beneficially population	25,000	
5	The road length	23 Kilometer by DDP	People have extended the road to further 9 kilometers by their own resources
6	Total actual construction cost	NRS, 21,135,02	
7	Cost per kilometer	NRS, 918,940	
8	Total value of construction	NRS,41,871,469	(Rs. 1,820,498/km)
9	Total workers employed	434,870 Pd	18,907 PD/KM
10	Breakdown of costs		
a	Labor payment 69.7%	NRS, 14,731,514	Rs 640,500/Km
b	Construction Materials 15.7%	NRS, 3,318,289	Rs 144,273/Km

c	Tools and equipment5.5%	NRS, 1,162,458	Rs 50,542/Km
d	Other management costs 9.1%	NRS, 1,92, 340	Rs 83,623/Km
11	Breakdown of Construction components		
a	New road construction90.3%	NRS,19,085,449	829,802/Km
b	Repair & maintenance 8.5%	NRS 1,796,526	Rs.78,110/Km
c	Bio-engineering works 1.2%	NRS.253,627	Rs.11,027/Km
12	Investment inside the district	75% total construction cost	Cost of labor, local supervisor and other staff
13	Local contributions	Land provided free of cost	
		Participation in planning, implementation and monitoring	Taking responsibility of construction management and arrangement of technical staff
		Labor contribution 25% of district wage rate	
		Labor efficiency	
14	Responsible organization for road operation and maintenance	Dhading DDC	
15	Road maintenance system introduced in	1992	
16	Resources for road maintenance	Toll, tax, DDC grant	

Source: Side Consultant, Nov. 2001

Located close to Kathmandu, Bhimdunga-Lamidanda Road (BLR with 22.5km) opens up the fertile area between the Mahesh and Kolpu river valleys, which has a high potential for horticulture and vegetable production. It is linked to the road from Kathmandu Ring road to Bhimdunga (5.5km), which was constructed by the Department of Road (DOR). From Ryale Chaur, two bifurcations are proposed of 7 km length each, reaching the valley to both sides.

The selected area (Green Road) for the study is very close to the Kathmandu valley. The selection of this road has been with the intention of exploring the impacts that the rural people are feeling by the introduction of this road. The selected study areas fall in two districts of Nepal. The selected name of road is Bhimdunga Lamidanda Green Road. This road starts from Bhimdunga (Kathmandu district) and ends at Lamidanda (Dhading District). The maximum parts of Kathmandu district and two VDCs, named as ChhatreDeurali and Jeevanpur, of Dhading district. The total length of road is 23km. Out of this mentioned length only 3km is falling in Bhimdunga VDC of Kathmandu district (which is nearly 7 Km from Sitapaila of Kathmandu valley) and rest in Dhading district. Therefore, short introduction of these two districts have been described here.

4.2 Introduction to Kathmandu District

Kathmandu, the capital city of Nepal, situated in the middle hill of the country has a very ancient history of its origin. The history of Kathmandu dates back to the 8 th century with King Gunkamdev. He stablished Kathmandu in 726 A.D (Sthapit, 1999: iv-4). The introduction of the road Kathmandu was created by the two words. Kastha and Mandap in which, Kastha meaning 'Wood ' Mandap meaning beautiful shade or cover. The city was so full of wooden building and temples that it looked like it had a beautiful wooden cover. After many years the words " Kasta Mandap" changed and new word Kathmandu is also sometimes called Kantipur.

The capital of Nepal, Kathmandu valley, is situated in the mid hill of the territory. The Kathmandu is one of the most valuable districts out of three districts of Kathmandu valley. The Kathmandu valley is situated within thew sangabhanyang in East, Badbhanjyang in west, Pharping (Saukhel) in South and Panchmanebhanjyang in North. This district is located between 27 degree 27 minute to 20 degree 49 minute

North latitude and 85 degree and 10 minute to 85 degree 32 minute East latitude (DPD 2002). Bhaktpur and Kavrepalanchok districts are situated in East of this district. Dhading and Nuwakot districts are situated in West of districts. Lalitpur and Makwanpur districts are situated in south of the district. This district falls under the Central Development Region of Nepal. This district has 57 VDC, One Municipality and one Metropolitan city. The average temperature of this road is 22 degree centigrade with minimum temperature was not less than 2 degree centigrade and the maximum temperature was not more than 32 degree centigrade.

Table 4.2 General Information

S.N	**Description**	**Features**	**Remarks**
1	Area in sq km.	395	
2	Elevation(m)	1372-2732	
3	District Headquarter	Kathmandu	
4	Number of VDCs/Municipality	57/2	
5	Number of Constituencies	7	
6	Total Population	1081845	
7	Sex Ratio (Male/ Female)	1081845	
8	Under 14 population	28.1	
9	Elderly Population (75+)(%)	5.4	
10	Annual Growth rate	(1994-2001) (%)	
11	Number of household	235387	
12	Average Household size	4.6	
13	Population Density(persons/sq.km)	2739	
14	Urban population (%)	1	
15	Ranking among district	1	By population
16	Proportion on National Figure (%)	4.67 0.27	By population By Area
17	Literacy (%)	77.07 86.35 66.44	Both Sex Male Female

18	Net Enrolement Ratio	85.9 61.5 51.9	Primary L.Secondary Secondary
19	Human Development Index	0.603	
20	Population per Doctor	3948	
21	Population per Hospital bed	616	
22	Household with access to Toilet Facilities (%)	92.41	
23	Population with access to safe Drinking water (%)	84.15	
24	Population influenced per KM of Road	840	
25	Total Road (KM)		

Source: District Profile of Katmandu: 2004

Main rivers of Katmandu district

1. Bagmati River
2. Visnumati River
3. Rudramati River
4. Salinadi River
5. Mahadev Khola
6. Indramati River

Table 4.3 Population Distribution of Kathmandu District

Year	District Population	Urban Population		Rural Population		Urban Population at National Level (%)
		Population	Percent	Population	Percent	
2028	353756	150346	42.50	203410	57.50	…….
2034	422237	235144	55.69	187093	44.31	6.4
2048	675341	452596	67.02	222745	32.98	9.2
2058	1081845	712681	65.87	369164	34.13	14.2
Total Incenseme nt (%)						7.8

Source: National Population Census, 2028, 2034, 2048, 2058

The above shown table shows the population distribution of Kathmandu district. This data has been taken from the National Population Census from year 2028 tp 2058. As this table shows the data of population with percentage in urban and rural area. This table also shows the data of population in different year of Kathmandu district. As per this table the total increment of urban population at national level is 7.8 percent.

Table 4.4: Land Distribution of Kathmandu District

Slope Range in degree	Discription	Area in Hectare
0-3	Plane land	10465
3-15	Low sloped land	12832
15-30	High sloped land	11358
30-60	Medium sloped land	3333
> 60	Steep sloped land	0
	Total	37988

Source: District Soil Conservation Office, 2059.

The represented above table shows the data of land distribution in Kathmandu district. This table shows that the Kathmandu district has more land of plane and low nature. but the area of land of low slope and high slope are nearly same. Similarly, it has less and of medium slope nature.

Transportation Facilities in Katmandu district: This district has mixed and complex nature of transportation facilities. The main vehicles running on the urban roads are taxi, microbus, mini bus and motor bikes etc. Katmandu district has classified the district roads in five categories. These areas:

a. National Strategic Roads
b. Municipal Roads
c. District Roads
d. Village Roads
e. Agriculture Roads

Source: District Profile Analysis, Kathmandu 2061

Social Infrastructure Services in Katmandu District

Education is the most important subject within social infrastructure service. The below given table shows the schools that has been running by the government and private source.

Table 4.5: Schools in Katmandu district

Level	**Govt. School**	**Private School**	**Total**
PPP Primary School	262	752	1014
Lower-Secondary School	210	373	583
Secondary School	110	307	417
Total	582	1432	2014

Source: District Profile Analysis, Katmandu 2061.

Above table showing that private schools are than government's schools in Kathmandu district.

Table 4.6: Students Studying in Kathmandu District

Description	**Govt. School**		**Private School**		Total	
	No	%	No	%	No	%
PPP Primary School	68872	49	71879	51	140751	100
Lower-Secondary School	27924	54	23787	46	51711	100
Secondary School	11670	49.12	12052	50.89	23722	100

Source: District Profile Analysis, Katmandu 2061

The total literacy rate of 6 years of older than this age of this district is 77.2%. Out of this percentage the literacy rate of male is 66.6% and 86.5% is for male.

In the sector of health institutions this district is very rich. The total numbers of health institution is 72 at a rate of 15026 populations per health institution. 77.42% of total populations are using contraceptive to control the birth of child. The average first

marriage age of female of this district is 21.73 years and 25.74 years is of male. the marital status of population aging between 10-14 years of this district is 0.42 %.

As per CBS data nearly 93.2% populations are using toilets for sanitation of environment and 90.3% populations are drinking safe water.

Source: District Profile Analysis, Katmandu 2061

Table 4.7: Population Distribution by Religion

Hindu	Buddha	Muslim	Kirat	Christian	Others
75.49	21.66	1.11	0.70	0.79	0.24

Source: District Profile Analysis, Katmandu 2061.

4.3 Description of Bhimdunga VDC

4.3.1 Physical Setting of Study Area

Bhimdunga VDC is one of the most important VDC of Kathmandu district having 57 VDCs. this VDC is situated in the South –West side of Kathmandu Valley. This VDC is bounded by Ichnkhu Narayan, Ramkot, Dhachok and Chhatredeurali VDCs. Ichangu Narayan, Ramkot and Dahachok VDCs are of Kathmandu districtand Chhatredeurali VDC is located in Dhading district. This VDC is situated nearly 6Km far from the sitapaila of Kathmandu Valley. Being East faces village has 9 wards. As the location of this VDC is very near to the Katmandu valley, so it has little facility of transportation than other remote villages from main city to this VDC. Blacktop road is connecting from Sitapaila to Besishahar of Dhading District which is passing through Bhimdunga VDC. The road starting from this VDC of Bhimdunga VDC of Bhimdunga Bazzar . B-L Road connects a high potential agricultural pocket of south –eastern of Dhading district and South Western part of Kathmandu district besides providing transportation facilities; it provides market access to the agricultural products made of this area. That is why value and quantity of total farm products made through this road is quite higher than import of provisional goods and construction materials made through this road. This VDC is located in valley and around it big hills are situated. Being of East face the environment of this place is

healthy. It is rich in water resources and productivity is higher than neighboring VDCs.

4.3.2 Socio-Cultural Setting of Study Area

i) Demographic Aspects

Community

This VDC is divided in 9 wards and 22 Communities. As per CBS data of 2001 year Gokhola community has 42 households and next Kadar community has 38 households. Similarly, other communities are having lesser household's comparison to these two communities. So these communities are highly populated. Bahal community is the centre area of this VDC. Bhimdunga Bazzar is located in Bahal community. This Bahal community is the centre point for the business activities in Bhimdunga VDC. This road is passing through ward no. 1, 3, 4 and 6 of this VDC. So four wards of this VDC are touching this new constructed road. Therefore, these wards are more benefited than other wards of this VDC.

Table 4.8: Community Name and Households in Bhimdunga VDC

1	Kadar	38
2	Darshankhola	15
3	Thaple	29
4	Dubechaur	12
5	Baral Danda	19
6	Khadkagaun	20
7	Kanpur	13
8	Pakhure	21
9	Majuwa	25
10	Nayabasti	13
11	Bahal	31
12	Tribeni	10
13	Goregaun	15
14	Yuddhajung	25

16	Namtu	17
17	Tersagaun	17
18	Dhansar	21
19	Ghokhola	42
20	Bhirkot	20
21	Gairigaun	9
22	Mangalki	22
23	Others	77
Total		**536**

Source: District Profile of Dhading, 2001.

Population

As per CBS: 2001 data the total population of this VDC was 2622 with 536 HHs. Out of this total population, there were 1324 nos. male constituting 50.46% and 1298 nos. Female constituting 49.54%. But according to the Census, 2005 the total population of this VDC was 3152 nos. Of male constituting 50.50% and 1561 nos. of female constituting 49.50 % by sex. The literacy rate of this VDC in percentage is high. According to Katmandu District Profile, 2005 the literacy rate of this VDC is as 64% people are literate and 36% people are illiterate.

Table 4.9: Comparison of HH with Population

Year	Total No. of HH	Population			Remarks
		Male	Female	Total	
2001	536	1324	1298	2622	CBS, 2001
2005	644	1592	1561	3152	Census, 2005
Increase	108	268	263	530	
% increase	30.15	20.24	20.26	20.21	

Source: CBS 2001& 2005

As per Dhading Development Project, rural development Programme-GTZ, the construction work of Bhimdhunga –Lamidanda Road was completed in December 1996. As per comparison table, total number of HHs in Bhimdhunga VDC with

population of male and female at the period of 4 years showing that 108 nos. of HHs has increased after construction of road. Similarly, 268 nos. of male population and 263 nos. Of female population have increased during the period of 4 years.

Table 4.10: HH in Bhimdunga VDC with Population of Male and Female

VDC	AV.HH	Total No. Of HH		Population	
Bhim	4.89	Male	Female	Total	
		1324	1298	2622	CBS, 2001
		1592	1560	3152	Census, 2005

Source: CBS 2001

Above table shows that the average household in this VDC has 4.89 populations i.e. there are 4.89 members in each family, which may be both sex. As per the above table there were 536 households of total population 2622 numbers with both sexes in census 2001. Similarly, there were 644 numbers of households of total population 3152 numbers including both sexes in census 2005.

Table 4.11: Eldest and Incapable people in Bhimdhunga VDC

Eldest People		Incapable		Total		Remarks
Male	Female	Total		Male	Female	Total
10	22	32	57	10	79	89

Source: District Profile of Dhading, 2001.

As per the district profile of dhading district, 2001 there were 32 numbers of eldest person's in Bhimdhunga VDC and 57 numbers of incapable persons. Out of these total 89 persons 10numbers are male and rests are females.

Sex: As mentioned above that there were 536 numbers of households in Bhimdhunga VDC as per as CBS, 2001. These total households have 2622 population. Out of this total population there were 1324 numbers of male and 1298 numbers of females. This table shows that the number of male population is more than females.

Table 4.12: Households and Population with Sex

Ward No.	Household	Male	Female	Total
Ward No-1	74	156	166	322
Ward No-2	70	190	157	347
Ward No-3	99	258	254	512
Ward No-4	50	146	115	261
Ward No-5	50	109	122	231
Ward No-6	46	108	120	228
Ward No-7	66	167	160	327
Ward No-8	49	113	130	243
Ward No-9	32	77	74	151
Total	**536**	**1324**	**1298**	**2622**

Source: CBS 2001

Age: The below given table shows the number of male and female of different age group sat a interval of 5 years. More number of populations is falling under the age group of 10-14 years, which is 349 numbers. Out of this population of this group the number of male population is little bit more than female population. Similarly, least population of both sexes are falling under the age group of 70 -74 years. In this age group the number of male population is more than female population.

Table 4.13: Population by 5 years age group and sex

Age Group	Both Sex	Male	Female
0-4 years	254	130	124
5-9	311	160	151
10-14	349	176	173
15-19	319	155	164
20-24	257	118	139
25-29	216	117	99
30-34	181	93	88
35-39	167	83	84
40-44	121	63	58
45-49	99	51	48

50-54	98	47	51
55-59	55	30	25
60-64	77	37	40
65-69	47	26	21
70-74	34	18	16
75 & above	37	20	17
Total	**2622**	**1324**	**1298**

Source: CBS, 2001.

ii) Social Aspects

Caste / Ethnicity

Bramin,Tamang, , Kshetriya, Sanyasi and Newar are among the dominant caste in this VDC. Damai, sarki and Kami are native and backward group people of this VDC. Magar and Tharu are the dominated and they are very little in population.

Table 4.14: Population by caste /ethnicity

S.N	Name of Cast	Population
1	Tamang	780
2	Chhetri	649
3	Bramin	494
4	Sanyasi	202
5	Newar	198
6	Sarki	143
7	Damai	73
8	Identified	48
9	Kami	14
10	Magar	14
11	Tharu	6
12	Others	4

Source: CBS, 2001.

Language: According to the data of CBS, 2001 most of the people of this village are speaking Nepali language as a mother tongue. Newars are the other dominant caste of this VDC. According to the population of caste Newars are fifth in rank, but by

language they are second in rank. Similarly, Tamangs are highly populated in this VDC, but they are third in rank in language.

Table 4.15: Population by Mother Tongue

S.N	Language	Population
1	Nepali	1640
2	Newar	191
3	Tamang	745
4	Others	46
Total		**2622**

Religion

Most of the people of this VDC are Hindu. Some population of Buddhist has been found in this VDC. They are celebrating festivals and religious activities according to their religions. Dashain and Tihar are two important festivals celebrating by Hindus and Buddha Jayanti is the main festival of Buddhist.

Table 4.16: Population by Religion

S.N	Name of religion	Population
1	Hindu	2242
2	Bouddha	351
3	Islam	0
4	Kirat	0
5	Jain	0
6	Cristian	28
7	Sikha	0
8	Bahai	0
9	Not stated	1

Source: CBS, 2001.

Education

This VDC is rich in education facility having 6 numbers of schools in this VDC. Among them there is one secondary School, three primary schools and one boarding school. the student of this village are getting higher level of education from neighboring VDC named Ramkot, Sitapaila. Other non government school also helping to get education to this VDC's students. According to the VDC report, 405 people are literate and 60 % people are the illiterate. One plus two level school and higher secondary school of Ramkot VDC provide higher level education to the student of this VDC.

Table 4.17: Population by 6 years age and over and literacy status

Can't read &write			Can read only			Read and write			Total		
M	F	Tot	M	F	Tot	M	F	Tot	M	F	Tot
252	260	812	18	15	33	917	586	1503	1187	1162	2349

Table 4.18: Population by 6 ears f age over by status of school attendanc*e*

Currently Attending			**Currently Not Attending**			**Total**
Male	Female	Total	Male	Female	Total	
350	365	715	120	173	293	1007

Source: CBS, 2001.

Table 4.19: Literacy rate of Bhimdunga VDC

Education status	**Male**	**Female**	**Total**
Literate	252 (31.03%)	560 (68.97%)	812 (33.56%)
Literate	935 (60.87%)	601(39.13%)	1536 (66.44%)

Above table shows the educational status of Bhimdhunga VDC according to the data analysed by the CBS, 2001. The above data shows the percentage of literate and illiterate by sex above the age of 6 years. According to this table 60.87% male population and 39.13% population are literate. But, in average, the literacy rate is 66.44%.

Institutions of VDC and Enrolments Statistics

One of the indicators of development is the education facility. this VDC is rich in education facility having 6 numbers of schools. There is no any campus in this VDC. But the student of this VDC is getting benefit from Ramkot VDC, where one 10+2 level campus is established. To achieve higher-level education the student of this VDC goes to Kathmandu Valley, which is nearly 6km far from Ramkot. So lots of facilities are available to get the different kind of education to the students of this VDC. Name and locations of institutions available in this VDC are listed below.

Table 4.20: Schools Available in Bhimdunga VDC

S.N	Name of School	Location
1	Shree Balbodh Madhyamik School	Bahal, ward no-4
2	Shree Chundevi Primary School	Ward No-7
3	Shree Mahesh Narayan Primary School	Ward-2
4	Shree Bhimdhunga Primary School	Wardno-3
5	Shree Majuwa Primary School	Wardno-3
6	Shree Navin Jyoti Boarding School	Wardno-1

Source: Field Survey, 2007.

The above institutions detail of vdc shows the education facility available in this community. Out of the above institutions Higher Secondary level school provides class levels education to the students of the ramkot VDC. For higher level education, the students of the vdc are goes to Ramkot VDC, which is neighboring vdc..This facility helps poor people to send their children to get the education in cheaper cost than to send them in Kathmandu valley. Well running of these institution shows that people of this VDC are co-operating the governments.

One Navin Jyoti Secondary English Boarding School has been established in this VDC and running well with average 150 students. This is the only private school in this VDC.

Table 4.21: Enrolment Statistics of VDC in Year 2061

Education Level	Male	Female	Total
Primary	108	112	220
Lower secondary	88	89	177

Above table shows the enrolment of students in primary and lower secondary level in session year 2061. This shows that at primary level more students have been admitted and out of total students the number of female candidates was more.

Table 4.22 Enrolment Statistics of VDC in year 2062

Enrolment Status in 2062			
Education Level	Male	Female	Total
Primary	124	150	274
Lower secondary	78	95	173

Source: Field survey, 2007

Above table shows the enrolment of students in primary and lower secondary level in session year 2062. This shows that at primary level more students have been admitted and out of total students the number of female candidates was more.

Table 4.23: Enrolment Statistics of VDC in year 2063

Enrolment Status in 2063			
Education Level	Male	Female	Total
Primary	110	145	255
Lower secondary	95	111	226
Secondary	7	11	18

Source: Field Survey, 2007.

Above table shows the enrolment of students in primary and lower secondary level in session year 2063. This shows that at primary level more students have been admitted and out of total students the number of female candidates was more.

Table 4.24: Enrolment Statistics of VDC in year 2064

Enrolment Status in 2064			
Education Level	Male	Female	Total
Primary	115	145	260
Lower secondary	910	115	205
Secondary	15	10	25

Source: Field survey, 2007.

Above table shows the enrolment of students in primary and lower secondary level in session year 2064. This shows that at primary level more students have been admitted and out of total students the number of female candidates was more.

Table 4.25: Enrolment Statistics of VDC in year 2065

Enrolment Status in 2065			
Education Level	Male	Female	Total
Primary	110	140	250
Lower secondary	91	116	207
Secondary	12	17	29

Source: Field survey, 2007.

Above table shows the enrolment of students in primary and lower secondary level in session year 2064. This shows that at primary level more students have been admitted and out of total students the number of female candidates was more.

The above tables show the enrolment statistics of the schools in Bhimdunga VDC for the consecutive last four years. These tables show that in each level, the enrolments of girl's candidate are more in each year.

Health

This society gets health services from Sub-Health Post, which is located within the community. Aama Samuha and Women Volunteers (Family Planning Association

Workers) also providing services to the community of Kathmandu Valley. These facts show that this society is rich in health services.

Marriage System

As per CBS, 2001 data 1249 nos. People are married and 786 nos. People are living single. As stated earlier most of people are following Hindu religion so, they are getting married according to Hindu rule and regulations. Most of the old aged people had get married as a arrange marriage system but, young aged people are celebrating marriage according to new tradition and boned together by love marriage. No divorced and separated people are found in this VDC.

iii) Economic

Agriculture Land and Livestock

As per CBS, 2001 data out of 536 households nearly 254 households having land, livestock and poultry farm and only 17 households are landless and don't having any livestock. Most of the people are landless but they have other activities i.e. either they have any kind of business activities or livestock's. So nearly 50% of the total households of this VDC are wealthy and more than 50% of households are coming under poor category.

Table 4.26: HH having Agricultural Land, Livestock and Poultry

Agriculture Land only	Livestock only	Poultry only	Land & Livestock	Land Poultry	Livestock & Poultry	Land Livestock & Poultry	Non of All	Total
67	5	1	172	14	6	254	17	536

Economic Activity

The people of this VDC are found very active and enthusiastic. Newars are the main caste, which are busy in business. Ward no.4 (Bhimdunga Bazar) of this VDC is under the hold of Newar and most of Newari people are engage in business activities. Nearly 90% people of Bhimdunga Bazar are busy in their business. With the help of electricity facility they became busy and run their business in night also.

Table 4.27: HH Operating Small Scale Non-Agricultural Economic Activity

No. of Households					Type of activity			
Having Economic Activity	Not Having Economic Activity	Total	Manufacturing	Trade/ Business	Transport	Service	Other	Total
222	314	536	6	58	7	145	6	222

Source: CBS, 2001.

Transportation and Communication

Nearly all wards of this VDC are linked by village road and track. Newly constructed Bhimdhunga-Lamidanda Green Road starts from ward no 4 of Bhimdunga Bazar and link with the headquarter of Dhading district. This road also passing through ward no 3, ward no.1 and ward no 6 of same VDC. Themajor feeder road to link to Dhading district starts from sitapaila of Kathmandu Valley and meet at Bhimdunga Bazar. More than 30 nos. Land line telephone and CDMA lines are distributed in this VDC. Cellular Mobiles are also working there. In fact this VDC is rich in electricity and communication facility.

Other Facilities

About 90% households are getting electricity facilities. Due to the availability of electricity they are using this electrical energy to run the small-scale Industry, with the help of this facility they are running Saw Mill, Plastic Factory, Rice Mill, Furniture and other small industry. As most the people of this VDC are engage in business activities so, the economic status of people of this VDC is high.

According the people of this VDC, more than90% of the populations are getting drinking water supply from pipe among them 60% drinking water and remaining 40% gets water from pipe but not safe because of polluted sources and storage system is not appropriate.

Biogas program is also a successful program, which still in progress. Community Development Society of Bhimdunga conducts this program in association with an

INGO named as World Vision. The office of this institution has been established in ward no-1 of Bhimdhunga VDC. Till to date this Community Development Society has distributed about 41 bio-gas plant in this VDC which has been constructed with toilet attached. This biogas plant helps to save the forest by deforestation. This shows the fact that nearly 6% households of VDC have toilet and gas.

For the security of people of this VDC, one ilaka police station is located in Bhimdhunga Bazar. This Police Station provides security to the people of this VD

CHAPTER - V

IMPACT OF GREEN ROAD ON RURAL DEVELOPMENT

The indicator of development is socio-economic condition of society. Demographic, Household, population, income employment, Health and Awareness etc, affect the socio economic condition of community. Factors so, the above-mentioned data of indicators for development of any society has been analyzed in detail to show the impact. In this case study of selected area showing that how a road impacts in rural development.

5.1 Demographic Aspects

5.1.1 Households and population

This table shows the households and population distribution in study area in which population with sex has been tabulated. As demographic factor is one of the most important factors to analyse the objective of the study. It will show the impact on socio-economic status of rural people in study area.

Table 5.1: Household and population of respondents

Year	Total No. of HHs				Remarks
		Male	Female	Total	
2001	536	1324	1298	2622	CBS record
2005	644	1560	3152		CBS record
2006	655	1637	1605	3242	Field Survey
Increase/YR	11	45	45	90	
% increase	1.71	2.83	2.88	2.86	
Sampled HH	50	136	134	270	Field Survey
As average households size coming 5.40, so total estimated population in year 2007 became 3623					
2007	671	1832	1791	3623	Field Survey
Increase	16	195	186	381	
% Increase	2.44	11.91	11.59	11.75	

Source: Field Survey, 2007.

Thus, from the above sampled household, the average household size being 5.40. Similarly, from the total number of households 671 the total estimated population respondents being 3623. Therefore, we can predict that the total population during study period is clearly greater than the population from previous years, which is in increasing rate. The rate was 2.86 % from year 2005 to 2006 and now this has again increased up to 11.75 % from year 2006 to 2007. This increase in population and households in mainly due immigration to road corridor.

Table 5.2: Average Households Size of Respondents

Average Households Size		
Level	**Households Size**	**Source**
National	5.6	CBS,1991
District	4.6	CBS,2001
VDC	4.89	CBS,2001
Sampled HH	5.40	Field Survey

Source: Field Survey, 2007.

Table: 5.2 shows the average households size of Nation, district selected VDC and respondent households. The average household size of responded households is 5.40, which is higher than district and near to nation.

5.1.2 Age and Sex

Age and sex also plays a greater important role in the development of any society. Because the people of age group between 15-44 years and 45-69 years are the main developer of any society. In this sub-section it has been shown that how many numbers of populations of different age and sex are resides in this community. This table shows green road impact on the demographic factor by change in socio-economic status of respondents.

Table 5.3: Population by age group and sex of Respondents

Sampled HH			
Age Group	Both Sex	Male	Female
0-4yrs	26 (9.6%)	11 (42.3%)	15 (15.7%)
5-14 yrs	50(18.5%)	25(50%)	25 (50%)
15-44 yrs	145 (53.7%)	72 (49.7%)	73(50.3%)
45-59	37 (13.7)	22 (59.5%)	15 (40.5%)
60 & Above	12(4.5%)	6 (50%)	6 (50%)
Total	270 (100%)	136(50.4%)	134 (49.6%)

The above table shows the population distribution by age structure. The population of male was higher than population of female of respondent in study area in previous census. Same data has also been found during field survey as shown above in respondent households table. The population female of age 60 and above is also lesser than male, but during field survey, population of male and female of age more 60 years are same. Maximum population of male and female in between 15-45 years has been found during field survey. This tabulated data shows that numbers of between 15-45 years in this VDC. This fact says that the male person of Bhimdunga VDC live longer than women.

Above table shows that 9.6 % of population of the sampled households lies in the age group of 0-4 years, which is the group of non –schooling children. Among them 42.3% are boys and 57.7 % are girls. 18.5% of the total population lies in the group of 5-14 years. In this group of school going children. The population up and after age of 15 years and within the age of 60 years are considered as the economically active population. Hence the study shows that 67.4 % of the population is economically active. The majority of the population lies in the age group of 14-60 years, which is also known as worth earning group and during this period they like to live in couple. The age group constitutes the 51.65% of male population and remaining 48.35% of female within the group. Age group of 60 and above constitutes 4.5% of total population of sampled households in the study area out of which 50% are male and female are nearly same except the age group of 45-59. In this age group the

population of male is more than female. This also shows the same fact that the male of the study area live longer than women.

5.1.3 Family

The below given table show the types of family of respondents in study area. This is also a indicator of development and changed brought by the construction of road. As mentioned below that this road has imparted its affect on the type of respondent was joint type now it has change to nuclear family. This is also a change in socio-economic status of responded area. So this table shows that it fulfill one objective of our study.

Table 5.4: Types of Respondents

	Nuclear Family	Joint Family	Remarks
Before Road Construction	40	43	8 numbers respondents have responded that there is no any change in family size and 2 nos. Not responded any answer
After Road Construction	43	40	

Source: Field Survey, 2007.

Household survey in study area shows that out of 50nos. Sampled households 43 nos. has responded that most of the family in study area were joint family before road construction and after road construction most of the joint family has changed to nuclear family. Similarly, 47 nos. of respondent has replied that before road construction marriage process was happening according to traditional system but now it has changed to modern system. But most of them asked that our relation among the family members is as it was previous. Thus this fact showing that this constructed road has not affected any bad on the family relation of the

5.1.4 Birth

According to the field survey questionnaire, regarding the birth of children in his family, 22 nos. Respondent responded that the birth rate of child before the road was high and now this rate has reduced. Similarly, the mortality rate was high before road construction and how this rate has reduced.

5.2 Social

5.2.1 Educational Aspects of the Respondents

Education status of any community plays a vital role for the implementation of rural development programme. It is believed that educated people must change the society towards development for their own safe. If the community people are educated then society becomes more conscious about problems, which arises within the society. People's participation is the key factor for the implementation of development programme and it is possible only when people are educated. The living standard , education etc. This awareness about living style leads to earn more and live comfortably and this will ultimately be fulfilled by the development of their community.

Table 5.5: Educational Status of Bhimdhunga VDC

Education Level	Male	Female	Total
Primary	157	237	394
Lower secondary	35	51	86
SLC	54	55	109
Intermediate	25	21	46
Bachelor	8	6	14
Master	3	1	4

Source: Field Survey, 2007.

Above shows the education status from primary to post-graduate level of study area as per field survey. This table shows that in lower level up to SLC level percentage of female candidates are more than male but, it is decreasing in higher level education that is the percentage of male candidates are more than female.

50 households have been chosen as sample households. The total population of the sampled households is 270. Among them 26 children are below 4 years age considered as non-schooling children. The education status of remaining 244 numbers people is as follow:

Table 5.6: Enrolment Statistics of Study Area

Education Level	Male	Female	Total
Illiterate	8	15	23
No-Schooling Children	11	15	26
Total Illiterate	19	30	49 (18.15%)
Primary	43	37	80
Lower-Secondary	7	13	37
Secondary	13	13	26
Higher Secondary	29	16	45
Intermediate	32	8	40
Bachelor	7	3	10
Literate	131(59.28%)	90 (40.72%)	221 (81.85%)

Source: Field survey, 2007.

The above table gives the education status of sampled population and shows the present picture of study area. About 81.85 % of the population above 4 years of age is literate constituting 59.28 % of male and 40.72% of female of the total population. This result shows the very good picture of study area and it can be predicted that the literacy rate will cross 90% up to 2010 year, which is commonly known as near to cent percent literate. The average literacy rate of male is 74% and for female it is 44% in urban area of Nepal. Thus, the education status of study is less than urban sector and education status of responded households is more than the urban sector.

Table 5.7: Educational Status of Sample HHs by Sex in Study Area

Before Road Construction				**After Road Construction (2007)**				
Education Level	Male	Female	Total	Education Level	Male	Female	Total	Increase/ Decrease
Illiterate	13	37	50	Illiterate	8	15	23	27
Primary	7	3	10	Primary	43	37	80	70
Lower Secondary	2	2	4	Lower Secondary	7	13	20	16
Secondary	5	3	8	Secondary	13	13	26	18
Higher Secondary	3	2	5	Higher Secondary	29	16	45	40
Total	17	10	27	Total	92	79	171	144

Source: Field Survey, 2007.

In the above table no. – 5.11, the education status of sampled households have been shown by sex and has been compared the status of education before and after the road construction. The above table shows that the number of educated person has increased from 27 numbers in year 2002 to 171 numbers in year 2007. So this is a good impact of road in any rural area. It means due to the introduction of any infrastructure facility like construction of road in rural area may increase and improve the educational status of society. Similarly, the educational status of women candidates has also increased from 10 numbers in year 2002 to 79 numbers in year 2007.

If the rural sectors of Nepal will be facilitated with the development of infrastructure like bhimdunga VDC of Kathmandu district, then the literacy rate of the urban sectors simultaneously, the literacy rate of the country will automatically be increased. The above conclusion also shows that female should be more facilitate to increase their literacy rate.

5.2.2 Language

Most of the people of the study area are speaking Nepal as mother tongue. As there is no any change in speaking language. As per field survey 100% respondents have replied that there is no any change in language that is as was before the road construction but, 23 nos. households have replied that the nos. of person has increased to speak language other than Nepali.

5.2.3 Religion

Similarly there is no any change in the religion follower. As per field survey most of resident in this VDC are following Hindu religion. One positive impact was found that after the road construction and habits like drinking of local wine (Rakshi), gambling etc. has reduces a lot. Out of 50 nos have replied that in real manure it has been reduced.

5.2.4 Status of Women

At the same time, status of women in study area has improved more after road construction. In the education sector 48 nos. of respondents have said that this road has affected more in the status of women and it has improved positively.

5.2.5 Health Status

As this VDC is very near to Kathmandu Valley, so the people of the study area are found conscious about their health. But, due to the introduction green road the nos. of patient has increased in comparison to previous stage. It's due to air pollution by moving vehicle the dusty road. After the road construction no any such type of new disease was found in the study area. As per health post in-charge most of the asthma patient coming to this health post for treatment. According to field survey report the traditional treatment process for the cure of disease by local Lama's has very much decreases and people of study area has become very aware regarding the disease. So for the treatment of disease most of the people are use to go in hospital for the treatment. To give the birth of her children most of the women consult with the nurse present at the health post which has established in the VDC. So the delivery of child by old process (traditional), as it was delivered in their own house, has very much decrease.

The health status of study area is also good. It has already been mentioned above that this VDC is very near to Kathmandu Valley, which is nearly 10KM (in average) far from the VDC. Only one sub-health post is established in year 2055 in this VDC. As per Health Post in –charge, Mrs. Anita Budathoki-CMA, nearly 53- 60 nos. (per year) pregnant women admitted in this health post for delivery purpose and nearly 65-70 nos. (per year) of pregnant women are admitted before delivery for the pregnancy check-up. Other households that they take help from the health post staff and student (Traditional birth Attendant).

The below given table show the data of admitted patient in OPD in year 2063/064 6802 nos. of patients have visited the health post in year 2063. Out of the nos 1163 no. are child patients. As per this table maximum children are admitted for vaccines. This table shows that there are very less disease like Diarrhoea/ Dysentery in children in this VDC.

Table 5.8: Number of OPD Patients in Sub-Health Post in Study Area

No. of admitted Patients for different kind of treatment in the year 2063-2064							
S.N	Month	Total OPD Patients	Admitted Children Patients				
			Vaccine	Nutrition	ARI	Diarrhea/ Dysentery	Total
1	Sawan	616	22	28	7	6	63
2	Bhadra	619	40	41	14	6	101
3	Aswin	582	42	33	22	9	106
4	Kartik	594	71	38	7	4	120
5	Mansir	606	41	37	6	4	88
6	Poush	333	32	38	12	2	84
7	Magh	430	24	19	15	2	60
8	Falgun	633	36	35	16	3	90
9	Chaitra	581	61	38	12	7	118
10	Baisakh	639	58	36	13	13	120
11	Jestha	542	68	40	18	11	137
12	Ashad	627	22	22	14	18	76
	Total	**6802**	**517**	**405**	**156**	**85**	**1163**

Source: Field Survey, 2007

Above table shows that health status of people of Bhimdunga VDC. According to the above table more people admitted in OPD of Bhimdunga Sub-Health Post from the month of Baisakh to Bhadra. Similarly, more numbers of children suffer from Diarrhea and Dysentery during the month from Baisakh to Ashad.

Table 5.9: Family Planning Status in Year 2064-2065

S.N	Month	PILS	DIPO	Total
1	Sawan	20	170	190
2	Bhadra	21	173	194
3	Aswin	19	161	180
4	Kartik	18	158	176
5	Mansir	20	158	178
6	Poush	20	153	173
7	Magh	21	155	176
8	Falgun	23	150	173
9	Chaitra	21	146	167
10	Baisakh	21	111	132
11	Jestha	23	139	162
12	Ashad	95	147	242
Total		**322**	**1821**	**2143**

Family Planning Program is also successful in this VDC. Long ago people were not aware about birth of child. At that time people believed that family planning operation is not allowed in Hindu Religion in one hand other logic was if you have more children then you will get more care in old age. So they would be blessed to have more children by the elders. This is not true now, GPA was the revolutionary man in society who has done the change the society slowly towards small family is happy family. As per health post staff, 2143 women are in practice for the family planning. Out of this no. 322nos. are using PILS and 1821 nos. are using DIPO, so above table show that maximum women of the study area are uses DIPO system for the family planning.

As per Anita Budhathoki, senior staff of health post, she is giving training regarding the health and hygiene to the community people to clean the society at least 2-3 times in a year. During field survey, the selected study area was found healthy and clean. Most of the houses of this VDC have modern type of RCC building especially in road

corridor and also in Bhimdunga market area, which indicates the good housing condition of the community people than other community of Nepal.

5.3 Economic Aspects

5.3.1 Occupation Status

Bhimdunga VDC is not only good in educational but in agricultural production in this district. The major production of the VDC is rice., maize, vegetable, livestock etc. The main occupation of the people of this VDC is agriculture.

Out of 50 sampled households 33 households have agriculture as the main occupation and 13 households have jobs as secondary occupation of this VDC. These 33 households among the sampled households have paddy farming as the main occupation and serving with the income from agricultural production. These households apply the improved way of cultivation using improved type of seeds chemical fertilizers and pesticides to product the grains.

5.3.2 Income Status

In the other sector of economical activities total agricultural land of sampled households are nearly 130 ropanies and total bari land is found 121 ropanies. So in average nearly 5.02 ropani lands per household was found before road construction it has fall to 4.54 ropani land per households. This fact shows the people of this VDC is diverting from agricultural interest and giving more interest in business activities. In the survey of food stuffiness, more than 50% families are having food up to 3 months from the agriculture products. Nearly 15 families have food up to 6 months and rest families have sufficient food fro their agricultural land. In regards of occupation, before road construction, 33 households main occupation was farming the land 12 nos were in different type of services and only 4 nos were involved in business activity. Nos of households which were involved in services is same as it was before the road construction. This fact shows that the people of this VDC has diverted to business activities after the road construction.

The main sources of income of people of study area are from the business and services. Out of 50 sampled households 20 nos. Respondents are responding that they are getting income from business activities and 12 nos. respondents are replying that

they are getting income from services and rest are getting income from farming the land, animal husbandry, labor etc. All of them are said that this income has increased after the road construction. In aspect of households expenses of money, the expenses on medicine, food, purchasing, fuel, cloths, festival, marriage transportation etc. have increased after the road construction. Other physical facilities like road transportation, communication, electricity, sanitation etc, have increased after the road construction. After the road construction the people of the study area are using improve type of seeds, chemical, fertilizers and pesticides in their field. General expenses on house repairing, land purchasing, agricultural means purchasing of mortgage, investment on industry has increased after the road construction. This road has imparted positively on economic status of local people as the employment, agricultural products especially vegetable production, business household's industry small-scale industry, women empowerment etc. have increased in the road construction. Therefore, the number of household density has increased in the road corridor. Most of the people are like to construct their houses along the road corridor during the sick period and also for sending their children to schools. As per field survey, more than 50% of people in sampled households have pakki houses, but most of these were kachhi before the road construction.

Table 5.10: Annual Income of Sampled HHs

Annual Income of Sampled HHs			
S.N	Annual Income (NRS)	No Households	(%)
1	Less than 10,000	2	4
2	10,000-20,000	11	22
3	20,000-30,000	12	24
4	30,000-40,000	7	14
5	40,000-50,000	9	18
6	50,000-60,000	3	6
7	60,000-70,000	6	12

Source: Field Survey, 2007

Table 5.11: Per Capita Income of Respondents and HHs

Per Capita Income of Sampled HH					
S.N	Level	Income in Nrs	Income/HH in US$	Per Capita income in US $	Source
1	National	-	-	200	CBS,1998
2	Sampled HH	33600.00	516.92	96.44	Field survey
3	Av. Income of 15 HH, which are living in Bhimdunga Bazzar area Ward No-4 of VDC	47666.66	733.33	136.82	Field Survey

Source: Field Survey, 2007.

Above table shows annual income from Nrs 10,000 to 70,000 of each individual household respondent. The distribution of population is quite high in low income group. Above table also shows the per capita income is US $ 200 and sampled per capita income is US $ 96.44, which shows very low economic condition of them. The cause of vast difference between these two data is due to counting of whole day working hour in analysis, but the above given National data has counted 8 hours as a working hours as a working hour. Other thing US $ 200 is very old data of Nepal. That is why the calculated data shows the vast difference. Similarly, the average per capita income of sampled 15 households , who are resides in market area of Bhimdunga Bazar of Ward no. 4, is US$ 136.82 shows good in the context of Nepal for the period of disturbance due to war. This indicates that economic development has been taken place in study area, which is due to introduction of road only.

Employment Status: Bhimdunga VDC is very near to the capital of country. So the people of this VDC are more educated and very active in every sector of life chances activities. The people of this VDC are getting benefited from the Kathmandu Valley.

Table 5.12: Employment Status of VDC and Responded HHs

S.N	Level	Total Nos. of HH (Having Employed)	Economically active Households	Percentage of Employment	Source
1	VDC	145	222	65.32	CBS, 2001
2	Sampled HH	26	21	52.00	Field survey

Source: Field Survey, 2007.

Above table shows the employment status of the sampled households. CBS, 2001 shows that 65.32 % of the total households were recorded as employed but, during survey only 52.00% of the total households were found as employed. The cause of difference between these two data is due to counting of disguised unemployment as employed in the CBS survey. In the field survey this problem was avoided because the employed households were counted by individually.

5.3.4 Transportation Facility

Transportation facilities to reach up to the institutions have increased. Before road the pupils of this were use to go to school on feet. Now they have got more facilities to reach there. The enrolment status of boys and girls candidates has also increased after road construction. As per field survey the enrolment of boys is more than girls student. Now they have also got the facilities to achieve alternative choices to get education in different faculty due to the available of transportation and communication and very close to Kathmandu Valley. District change is been found in the ratio of literate and illiterate after road construction. As per field survey, 100 % respondents have said that before the road construction there is more illiterate person in this community but, it has now reduced more. In the other aspect like expenses on education sector of each individual household has increased after the road construction. 47 nos of respondents have replied like this that in average NRS. 10,000 to 50,000 per year expenses have increases but due to available facility lot of time is being saving. The other bad effect has imparted that before road the students of this village, mostly in lower level of education, were used to have food in their home now they are having in hotel. Thus the available transportation facility has affected more In

different sector in rural areas. In deed, construction of rural road plays a vital role in the rural development.

5.4 Environmental Aspects

5.4.1 Drinking Water

The availability of drinking water facility in any rural area is also one of the most important indicators of development. Presence of natural resources is itself a indicator of development. How much benefit is gaining from the available water sources and how it impacted on the socio-economic status of rural people has been shown hare. This indicator has been analyzed under environmental factor to fulfill our objective of the study.

Table 5.13: Sources of Drinking Water Facility of Sampled HH

S.N	Drinking Water	No of HH	Distance (AV)	Percentage
1	Tube Well	2	Within courtyard	4
2	Pipe	38	Max.500m	76
3	River	0		
4	Stream Water	0		
5	Boring	0		
6	Well or Kuwa	10	Max.500m	20

Source: Field Survey, 2007.

Table shows the availability of drinking water facility of Nepalese people. Only 34% of the total population gets drinking water through pipeline distribution, which is called safe drinking water system. Above table shows the drinking water supply for the sampled households, which is more than double than national figure. During field survey it was found that the people, who live on higher elevation of hills, have difficulty of drinking water facility. But those households live around the periphery of road corridor and in lower area having good facilities of water supply. Most of the households are drinking water through piped system. They are using natural sources through gravity flow system. The people of this VDC have arrange for water supply to his individual house at his own cost either through piped system by managing of

spring sources of digging of well. As a whole, during field visit, it has been noticed that the people of the study area have no any difficulty for drinking water. This fact shows that the facility of drinking water of study area is comparatively higher than the water supply condition of Nepal.

5.4.2 Housing Pattern

Increment of house in road corridor is also a kind of development in study area. As before opening of road in this area there were not so much houses along the alignment of road but, after the construction of road along the proposed alignment there has been increases more numbers of houses in road corridor. Due to the positive impact of road and available facilities along the road corridor the density of houses have increases. But, this road has also imparted some negative impact as houses along the road corridor are increasing in a haphazard way.

As houses density are becoming more and more after the road construction especially in road corridor and also in the Bhimdunga bazaar area, but, it has been found that the numbers of buildings are also increasing in this area. Similarly more people are constructing a permanent type frame structured buildings by replacing of tinned or thatched type roof. This fact shows that the previous condition and it has improved more than before the road construction. The main cause of construction of building along the road corridor is to take part in business activities so that the economic status of households will increase.

5.4.3 Sanitation

In the sector of sanitation, most of the households and residents in study area are aware. They are conscious about their health and the people also keep clean their community. The established health post's nurses are training the people of the study area regarding the health and hygiene and also conducting the sanitation program in this community as per schedule. As per field survey, not single households have constructed permanent type (water Sealed) latrine in their own cost. DDC, Kathmandu has also helped in this regard but it is not so effective and not covering the all household of this VDC. So, the resident of this study area are suing traditional process for the drinking water supply.

Health and sanitation status is one of the most important indicators of development because if any community is developed then there should be healthy environment within the community. If any community is developed in regards of health and sanitation means there is development. About all the rural development programs provides health and sanitation training. Related project also provides training regarding the awareness about health and sanitation in project area. We know that if the people of the any country are healthy then they can provide labor for the nation. It is said that 80 % of the disease in the rural area are caused by dirty drinking water. About 40,000 children age group0-5 years die annually in Nepal due to the transferable disease like Typhoid, Diarrhea, warm Jaundice and dysentery etc. and it is caused by drinking water and sanitation are also the major indicators of development. One well known proverb is "Health is wealth ".

Table 5.14: Sanitation Status of Responded Households

Sanitation Status Of Sampled HH			
S.N	Region	No Household	
1	HH with Toilet	36	72
2	*HH without Toilet*	*14*	*28*

Source: Field Survey, 2007.

The above table shows the sanitation status of Nepal and sampled households. About 90% of the households have to toilet in Nepal and western Development Region is rich in sanitation status with 18% of households having toilet in comparison with other development regions and Nepal too. Other table shows the sanitation status of sampled households have toilets facilities in their houses. The households of the study area also have good sanitation status, which has been mentioned above that about 41 households have bio-gas plant with attached toilet and it is 5.91% of the total households in VDC. This fact gives sanitation status of study area is comparatively higher than sanitation condition of the urban area of Nepal.

5.4.4 Landslide

As during the alignment of proposed road track of road was opened. During the opening of track lot of trees and bushes has cut during the construction period of road.

Some agricultural farmland and housing land along the road corridor has used for the road construction. Existing natural sources of drinking water has dry up after the earth cutting for the proposed road. Due to the disturbance in naturally established soil landslide occurs during the rainy season, is directly affecting the residents who reside along the roadside and road users also. Probability of accident has increased along the roadside. Like wise irrigation canals have been destroyed due to the construction of road. So, it has indirectly affected on the livelihood of the community people.

5.4.5 Air and Noise Pollution

After the first cutting of earth mass along the road alignment track was opened to movement of vehicles. When vehicles move on the earthen road the particles of soil get disintegrated due to the tire pressure of moving vehicles and it produces soil dust when vehicles move in their designed speed. This produced dust come in contact with the air nearby of vehicle moving on the road and spread along the person and households who come in contact with this produced smoke

Similarly, due to the movement of the vehicles on the road, the drivers are generally used horn of the vehicle, which make a sound pollution. This sound pollution makes noise, which directly affect on the resident and road users along the roadside. During field survey it was found that air and noise pollution has increased after the road construction.

CHAPTER - VI

SUMMARY, CONCLUSION AND RECOMMENDATION

6.1 Summary

Nepal is an underdeveloped country with many ethnic groups and varieties of culture and traditions with very low living standard. Economy is mainly based on agricultural production in which land distribution is not efficient. 75.5% of agricultural available in the hand of 17% of the people. Only 28.5% land is owned by 83% of farmer who are generally living in rural areas of Nepal. According to 1991 census 45% of the populations are below the poverty level. Therefore, to improve the socio-areas: development of infrastructure, introduction and constructions of green road is one of the most need and necessary. So, by the construction of green road in rural area the development of rural community can be done effectively.

Nepal is one of the poorest countries in the world. According to the World Bank Report of 1998, the per capita income is only US $210, which ranked as the 9th from the bottom of least of all countries. Out of total population 91% are live in villages whereas only 9% are in urban area. About 60% of the people are literate and most of them are live in rural areas. Thus the development of rural is important for the development of the country. However, Nepal is poor and always remaining poor due to the absence of appropriate planning and their implementation for the rural people. Their contribution to socio-economic growth remained almost non-existence. As a result, Nepal is facing the problem of underfed and underemployed people having the very low income.

It was only after 1951; Nepal undertook to planed development with the view to bring repaid improvement in the socio-economic condition of people. In earlier certain programs, such as Tribhuwan Village Development Program, Panchayat Development Programs (1960-1070), Sectoral Approach to rural development (1970-1975), integrated Rural Development Program (from 1975) and Rapti Village Development Program were initiated to tackle the problem of poverty alleviation. Since them many governmental and non-governmental poverty alleviation programs have been launched. Despite of several efforts towards socio-economic development during the

past two decades, there was little sign of momentum and dynamism that would indicate a trend towards a pattern of sustained long-term growth in income and output.

General impacts which have been imparted by the construction of Bhimdunga-Lamidanda road in study area are as follow:

- It has been found that nearly 10-15 households are increasing to the road corridor each year. This migration is either from the other wards of same VDC or from other VDC of same district. Similarly, population to the road corridor is also increasing at a rate of 11.75% per year. This increment in households and population is only due to the facility available along the road corridor.
- It has been found that there is also increment in education status and enrolment of students in schools in study area. The average literacy rate of VDC was about 66.44% in year 2001 (CBS, 2001) and the average literacy rate of Nation was calculated 42% in year 1999 (ADDCN, 1999). During field survey, the average literacy rate of sampled households has been found about 81.85% in year 2007 constituting 59.28% male and 40.72 female. Therefore it can be predicted that up to 2010 year the literacy rate of the study area crosses 90%, which is known as nearly cent percent literate because the enrolment status of this VDC is found good.
- It has been found that 76% of the population of study area gets safe drinking water through piped system using natural sources and about 20% population are using well or Kuwa for drinking water purpose. Population with access to safe drinking water of Nepal is 63% (Swashan, 1998). Moreover, it is true that about 63% of population get drinking water facility from any method but, not safe in all respect. So, the safe drinking water facility is also found satisfactory.
- Health condition of the study area has been found good. This is due to awareness and easy access to hospital. Hospitals are not far than 10KM from the study area. More than 75% respondent replied that they use to go to hospital for the treatment of disease. About 2143 numbers women of this VDC are uses PILLS and DIPO per year for the family planning. About 56-60 numbers pregnant women admit in health post for nursing. This VDC has about 41 numbers Biogas plants with attached toilets were constructed. This

shows that about 6% of the total households have toilet cum gas plants. It was found that nearly 72% of the sampled households have toilet facility in study area, which shows good condition of sanitation. The scene of shining RCC building painted with modern type of distemper and pigment color looks very beautiful from the higher elevation of this VDC. So it indicates improved condition of housing.

- Roads are scattered over this VDC and village roads link all wards. Besides this one major feeder road (Bhimdunga-Lamidanda Road) passing through the heart of this VDC. This same road linked with the ringroad at Sitapaila of Kathmandu Valley. Therefore this VDC has good facility of transportation and communication. More than 50 numbers of telephones has been disturbed in this VDC. More than 75% Population of this VDC are using electricity facility. People of this VDC have started poultry farming polythene pipe factory, furniture, rice, mills etc. activity.
- It was found that per-capita income of the sampled households is about NRS 33600.00 or about US $ 96.44 per annum in general and average income of 15 HH, which are living in Bhimdunga Bazzar area Ward No-4 of VDC having NRS. 47667.00 Or US$ 136.82 per annum. So the average income per household of this VDC is satisfactory than other VDCs of Nepal.

Positive Impact of Bhimdunga-Lamidanda Road

- Means of transportation improved and easy access to Kathmandu established.
- Market centre established and increase trade, business and employments opportunities.
- Household income increased and improved housing.
- Communication and community mobilization improved through print and electronic media.
- Status of Women improved by the involvement of outer activities like business, co-operatives.
- Awareness among local people increased in school enrolment. Boarding schools were also established for the first time.
- Agriculture production and vegetable market-oriented activities.
- Local people started intensive vegetable farming for their livelihood.

- Livelihood options of the people in the VDC are agriculture (44.1%), service (5.1%, business (4.6%) including students, housewife and others.
- Diversification has emerged and life status of the people has increased after the road construction. Household assests of the people have also increased.
- Overall impacts of the Bhimdunga-Lamidanda Road are in the adoption of market-oriented activities and intensive vegetable farming.
- Local people have time saved and this saving time have been used in productive work by the easy access to Katmandu.

Negative Impact of Bhimdunga-Lamidanda Road

- Big amount of crop was damaged along the road.
- Small amount of agricultural farm land and housing land were used for road construction.
- More trees were cut for furniture with establishment of saw mills.
- Regular flow of strangers have resulted an increase of conflict incidence of social evils such as gambling has increased.]
- Air and noise pollution has increased along the road corridor.
- Market center previously established in Bhimdunga Bazzar of Kathmandu district has sifted now to dhading district.

As construction of Bhimdunga –Lamidanda green road is also a indicator of development in rural area. This constructed road has imparted impact in the development in following sector of study area.

Demographic Sector

We can predict that the total population during study period is clearly greater than the population from previous years, which is in increasing rate. This rate was 2.86% from year 2005 to 2006 and now this has again increased up to 11.75% from year 2006-2007. This increase in population and households is mainly immigration to road corridor.

According to data of CBS, 2001, population of male is higher than population of female in Bhimdunga VDC. Same data has also been found during field survey as

shown above in sampled above in sampled HH table. The population female of age 60 and above is also lesser than male, but during field survey, population of male and female of age more 60 years are same. Maximum population of male and female in between 15 45 years has been found during field survey and same data shows in table as persons are more than women and there are more young persons of age between 15-45 years in this VDC. This fact says that the male person of Bhimdunga VDC live longer than woman.

Household survey in study area shows that out of 50 nos. Sampled households 43 nos. has responded that most of the family in this VDC was joint family before road construction and after road construction most of the joint families has changed to nuclear family. Similarly, 47 no. of respondent has replied that before road construction marriage process was happening according to traditional system but now it has changed to modern system.

According to the field survey , regarding the birth of children in his family, 22 nos. respondents responded that the birth rate of child before the road was high and now this rate has reduced. Similarly, the mortality rate was high before road construction and now this rate has reduced.

Social Factor

According to the institution detail of VDC shows the education facilities available in this community are more enthusiastic. Out of the total available institution, higher Secondary Level School provides 10-class levels education to the students of this VDC. For higher level education, the students of this VDC go to Ram kot VDC, which is neighboring VDC. This facility helps poor people to send their children to get the education in cheaper cost than to send them in Kathmandu Valley. Well running of these institutions shows that people of this VDC are co-operating the government. As per findings in the above chapter, shows that the primary level more students have been admitted and out of total students the number of female candidates was more.

As per field survey data the percentage if literate and illiterate by sex above the age of 6 years was found 60.87 % male population and 39.13 % population are literate. But,

in average, the literacy rate is 66.44%. The average literacy rate of male is 74 % and for female it is 44% in urban area of Nepal. Thus the education status of Bhimdunga VDC is less than urban sector and education status of sampled households is more than the urban sector. Therefore the above conclusion shows that, if the rural sectors of Nepal will be facilited with the development of infrastructures like Bhimdunga VDC of Kathmandu district, then the literacy rate of the urban sectors simultaneously, the literacy rate of the country will automatically increased. The above conclusion also shows that female should be more facilitate to increase their literacy rate.

Most of the people of the study area are speaking Nepali as mother tongue. As there is no any change in speaking language. As per field survey 100% respondents have replied that there is no any change in language that is at it was before the road construction but 23 nos households have replied that the nos of persons has increased to speak language other than Nepali.

Similarly there are no any changes in the religion follower. As per field survey most of resident in this VDC are following Hindu religion. One positive impact was found that after the road construction bad habits like drinking of local wine (Raksi) gambling etc has reduced a lot. Out of 50 nos of resident 45 nos have replied that in real manure it has reduced.

At the same time, status of women in study area has improved more after road construction. In the education sector 48 nos of respondents, in health sector 49 nos respondents and in the employment sector 46 nos. respondents have said that this road has affected more in the status of women and it has improved positively.

Due to the introduction of green road the number of patients has increased in comparison to previous stage. It is due to air pollution by moving vehicles on the dusty road. After the road construction no any such type of new disease was found in the study area. As per health post in-charge, most of the asthma patient coming to this health post for treatment. According to field survey report the traditional treatment process for the cure of disease by local Lama's has very much decreases and people of this VDC has become very aware regarding the disease. So for the treatment of disease most of the people are use to go in hospital for the treatment. To give the birth of her children most of the households are going to hospital for the delivery. Before

delivery of child most of the women consult with the nurse present at the health post which has established in the VDC. So the delivery of child by old process (Traditional), as it was delivered in their own house, has very much decrease.

The health status of study area is also study area is also good. This VDC is very near to the Kathmandu Valley, which is nearly 10km (in average) far from the VDC. As per health post in-charge (MRs Anita budhathoki-CMA) nearly 53-60 nos (per year) pregnant women admitted in this health post for delivery purpose and nearly 65-70 nos(per year) of pregnant women are admitted before delivery for the pregnancy check-up. Other households that they take help from the health post staff and sudeni (traditional Birth Attendant).

Economic factor

The main occupation of the people of this VDC is agriculture. Out of 50 sampled households 33 households have agriculture as the main occupation and 13 households have jobs as secondary occupation of this VDC. These 33 households among the sampled households have paddy farming as the main occupation and serving with the income from agricultural production. These households applied the improved way of cultivation using improved types of seeds, chemical fertilizers and pesticides to product the grains.

The main source of income from the business and services. Out of sampled households 20 nos respondents are responding that they are getting income from business activities and 12 nos respondents are replying that they are getting income from services and rest are getting income from farming the land, animal husbandry, labor etc. All of them are said that this income has increased after the road construction.

In aspect of households expenses of money, the expenses on medicine, food purchasing, fuel, cloths, festivals, marriage, transportation etc have increases after the road construction. Other physical facilities like transportation, communication, electricity, sanitation etc have increases after the road construction. After the road construction, the people of this VDC are using improve type of seeds, chemicals, fertilizer and pesticides in their field. General expenses on house repairing, land

purchasing, agricultural means, purchasing of mortgage, investment on industry has increases after the road construction. This road has imparted positively on economic status of local people as the employment, agricultural products especially vegetable production, business, households industry, small-scale industry, women empowerment etc. have increased after the road construction. Therefore the number of household's density has increased in the road corridor. Most of the people are like to construct their houses along the road corridor due to start the business, facilities of transportation, quick access to the hospital during the sick period and also for sending their children to school. As per field survey, more than 50 % of people in sampled households have pakki houses, but most of these were kanchhi before the road construction.

The average per capita income of sampled 15 households, who are residing in market area of Bhimdunga VDC of Ward no. 4 is US$ 136.82 shows good in the context of Nepal for the period of disturbance due to war. This indicates that economic development has been taken place in this VDC, which is due to introduction of road only.

As CBS, 2001 shows that 65.32% of the total households were recorded as employed but, during survey only 52.00% of the sampled households were found as employed. The cause of difference between these two data is due counting of disguised unemployment as employed in the CBS survey. In the field survey this problem was avoided because the employed households were counted by individually.

The available transportation facility has affected more in different sector areas. In deed, construction of rural road plays a vital role in the rural development.

Environmental Sector

Most of the households have constructed permanent type (water sealed) latrine in their own house and practicing to use the toilet. But, in aspect of drinking water supply, most of the households are using the natural sources of water through piped system at their own cost. DDC, kathmandu has helped in this regard but it is not so effective and not so effective and not covering the all household of this VDC. So, the resident of the VDC are Suring traditional process for the drinking water supply.

Due to disturbance in naturally soil stabilized soil landslide occurs during the rainy season. So, due to vehicle movement on the earthen road mud, especially during rainy season. Is directly affecting the resident who resides along the roadside and road users also.

During field survey it was found that the construction of houses in the road corridor is increasing in haphazard way. Environment is being polluted due to dust and smoke of moving vehicles. People are being ill due to smoke and dust, which this road produces.

As per respondents in holistic way, the advantages, which are imparting to the people of this VDC by the road, are as follow:

- Transportation facilities for men and goods.
- Helping to achieve education
- Helping to reach at hospital during sick period as due to the road ambulance reaches at home.
- Saving of time
- Helping in business activities like due to this road rice mill, saw mill, furniture etc has increased
- Employment has increased
- The value of land has increased due to road
- This road has opened the door for other infrastructure development
- All the households good are now available within the community.
- similarly, disadvantages which are imparting to the people of this VDC by the road are as follow
- Construction of houses in the road corridor has increased in haphazard way
- The chances of accident has increased
- Environment is being polluted due to dust and smoke of moving vehicles
- The problem of theft has increased
- People are being ill due to smoke and dust which are produced by this road
- Small stall for drinking of wines (local Raksi) are increasing
- Many water sources has dry due cutting of trees which was alone the road
- Land slide due to road has increased
- Mud is made on the road especially during rainy season.

- Irrigation canal's have been destroyed due to road
- Noise pollution has increased

6.2 Conclusion

Bhimdunga VDC lies in the southwest side of Katmandu Valley. This VDC is attached with the boundary of Dhading district. This VDC have nine wards and being a East facing is rich in availability of facilities. One man blacktop road is passing through the heart of this VDC, which is connecting Ring road at Sitapaila of Katmandu Valley at one end and headquarter of Dhading district on another ends. This road passing through the main market of Bhimdunga Bazzar and also along the agricultural area of Bhimdunga VDC of Katmandu district and jeevanpur and Chhatredeurali VDC of Dhading district. Most of the houses along the road corridor of this VDC especially in market are modern type of RCC Building arranged with available facilities. Governments annual program, NGO's and INGO's programs were launched during the time for rural development. The impact study of rural development program is very complicated because the time series data are not available and measurement of development indicator like health, sanitation etc is problematic. After comparing the available data and studying the earlier Chapters following conclusion have been drawn.

The impacts by Bhimdunga-Lamidanda Road that brought changes in the livelihood of the people of study area can be described as given below. Development means positive change of individuals and communities. This change can be accomplished through getting access to various assests or resources by the individuals and communities. In light of the objective of this study , the socio economic condition of the people have been found greatly affected due to the introduction of this road, which has impacted positively and negatively also on people's livelihoods in general

The process for rural development in rural area are the existing organizational infrastructure like NGOs, INGOs, group of community are essential for rural development but, not working properly.

NGOs have not been effective as program implemented by NGOs for poverty alleviation is uncontrolled and is not equitable among the regions. The same result has

been found in the study area like bio-gas plant distribution program in Bhimdunga VDC by Community Development Society working in the field of social development is not implements properly because of delay in getting loan and availability of loan is not always in accordance with their need and demand.

Similarly, administrative infrastructure like Village DEvelopment Committee and District Development Committee are bonded with limitation due to the ineffectiveness of decentralization act. Programs are formulated at the central level, which may not be suitable for grassroots level. It is realized in Ninth Plan that the focused programs for creating employment have failed to create an impact. So program implemented by different department also are not successful as it should be. It was found in the field survey that program for the construction of green road is more successful in their aspect and community is benefited from this program because this program. Was community based program based on community contribution. So organizational infrastructure is essential for rural development but not working properly because of inappropriate manpower and poor formulation of program. Similarly the ineffective decentralization act. For example, grassroots level organizations are estimating and formulating fund for any program on the basis of hundred percent of work but central level administrative institution allocates lesser amount of the requested fund, which ultimately is misused.

The major causes that caused development in socio-economic area in the study area are as :

- As this VDC is very near to Kathmandu Valley. This VDC is situated in the middle of Kathmandu

The major causes that affected in socio-economic development area in the study area are as follows:

- This VDC is very near to the Kathmandu Valley. This VDC is situated in the middle of Kathmandu Valley and Dhading Besi.
- The other cause of development of this VDC is gift of nature that is being of east facing villages are rich in water resources with fertile land.

- Agriculture production and vegetable marketing in this VDC has improved due to easy access of agriculture inputs. Therefore, the local people of this VDC are product their agricultural production as a market oriented.
- Due to the impacts of the Bhimdunga-Lamidanda Road, people of this VDC is in the adoption of market-oriented activities and intensive vegetable farming.
- Due to the available facilities of transportation and communication to kathmandu valley the local people of this VDC are saving their time and this saved time have been used in productive works and increasing their income.
- Other cause may be less problem of brain drain in this VDC. We know the major problem of the developing countries is brain drain and same problem applies for are living in their village and do not feel any hesitation to be involve in any type of productive work like service, teaching, vegetable farming, businesses activities in the young people of this VDC is due to the affect of Kathmandu City.
- Poverty I s the other cause for the development in the rural area due to which they could not move anywhere because they have not enough property means they have encourage the poor family to sell their product in the market because relatively better of family are also bringing their product in the market whatever the amount and types of production. This trend has helped poor people to fulfill their necessities.
- Good sentiment of co-operation among the people of villages may be the other cause of development of in rural area.

6.3 Recommendations

This research has been done with the objective to explore changes brought about by Bhimdunga-Lamidanda Road in the livelihood of the people in study area and analyze the existing organizational and administrative infrastructure that are essential to meet the requirement of rural development. With the study of the above chapters and survey of study area these recommendations have been found to make situation better.

- Without village profile a researcher has to face problem to collect necessary data. In this context so it is advised that it will be better if any VDC prepare its village profile with problems and prospects.

- The community at grassroot level with identifying their necessity should formulate programs by themselves. So, it is advised that plan formulation process based on participatory approach will help the concerned community in their need identification.
- It should be noted that the educated people in any community should live in their own community. It is necessary to stop migration of educated people from rural to urban sector by providing proper employment in their own community. Therefore, it will be better that if we are creating opportunities in our own communities and not giving opportunity to move the human resources outside of area.
- It will be better if Ministry of Education and Sports or related department provides the educational objective to encourage the poor Nepalese families to send their children to school. It is started in Ninth Plan as to make the free and compulsory primary education accessible the all.
- It is advised that any project that promotes industries/ factories and agricultural farming shall be launched in each and every community of Nepal. It is necessary to make a rural or community market for the delivery rural production and to make a storage system.
- It is recommended that administrative and organizational infrastructure is to be formulated to serve people but not to rule.
- Loans are necessary for livestock farming, cottage industry etc. in a nominal interest rate with long time installment payment. So it is advised that loans are to be provided in accordance with their need and demands of farmers.
- Nepal is an agricultural country and most of the people are living in villages so, it is recommended that emphasis should be given on historically disadvantaged communities to improve the living status and quality of rural life.
- It is recommended that locally available natural resources and local manpower should be mobilized and utilized more efficiently and effectively that are available in rural area.
- Local environment should be protected and a better microclimate situation should be created within the local area.

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Work Plan

Literature Review	Nov 15-30 (2008)
Library and Teacher consultation	Dec 1-10
Proposal Writing	Dec10-20
Questionnaire preparation	Dec20-30
Questionnaire finalization	Jan 1-10 (2009)
Data collection	Jan10- 20
Data processing	Jan20-31
Final tabulation	Feb1-05
Draft preparation	Feb05-15
Map preparation by GIS	Feb 15-30
Comments and discussion with supervisor	March 1-10
Submission and Evaluation	March 10-15

Observation Sheet

S.N. ……. Date: …….

Locality Name: …… Ward No. ……..

Types of Source: ……

Name of the Key In format:

Designation:

Address:

1. How Green Road is helping in the development of your society?
2. Could you tell me what types of positive impacts this road has imparted after the construction?
3. What are the negative impacts after road construction which passing through your community?
4. What are the improvements that came after road construction which directly affect on socio-economic development of society?
5. As a whole, what change you is feeling in your community due to this constructed road?
6. Do you want to suggest me any things that may impart positive impact to community due to construction of road?
7. Do you think need to constructed the road in rural areas?
8. Is road construction in rural area really helping the rural people?
9. What may be the negative impacts if any road which will pass through your village?
10. How does road support to this community to participate in various sectors /functions?
11. Is road a factor to impact on socio-economic sector or does it helps to change the status of rural area?
12. What are the problems you are facing from the difficulty of transport?
13. What do you suggest for improvement?
14. Do you face any kinds of social problem (conflict) in the lack of facility of road?
15. How many hours a day do you spent in walk before facility of green roads?

Thank you for your informative answer!

Questionnaire for Interview

Introduction:

a. Name of Resident:
b. Address:
c. Age:
d. Tole:
e. Sex:
f. Religion:
g. Education:

Social Schedule:

1. Total Family Member:

Age	0-5 yrs	5-15	15-45	45-60	> 60 yrs	Total
Male						
Female						

2. Status of Family Structure:

	Nuclear Family			Joint Family		
	It was more/less	It has increased/decreased	As it is	It was more/less	It has increased/ decreased	As it is
Before Road						
After Road						

3. Description about the birth of your children

	It was more/less	It has increased/decreased	As it is
Before Road			
After Road			

4. Description about the death in your family

	It was more/less	It has increased/decreased	As it is
Befor Road			
After Road			

5. Any change in marriage system after road construction

	Traditional System			Modern System		
	It was more/less	It has increased/decreased	As it is	It was more/less	It has increased/decreased	As it is
Before Road						
After Road						

6. Change in relation in family member

	It was more/less	It has increased/decreased	As it is
Before Road			
After Road			

7. Effect on Language after road construction

	Number of person speaking Nepali Language			Number of person speaking Other Language		
	It was more/less	It has increased/decreased	As it is	It was more/less	It has increased/decreased	As it is
Before						

Road						
After Road						

8. Status of change of religion

	It was more/less	It has increased/decreased	As it is
Before Road			
After Road			

9. Change in custom like praying God

	Traditional Process			**Modern Process**		
	It was more/less	It has increased/decreased	As it is	It was more/less	It has increased/decreased	As it is
\efore Road						
After Road						

10. Change in Status of abuse like drinking water, smoking, gambling etc.

	It was more/less	It has increased/decreased	As it is
Before Road			
After Road			

11. Change in status of women after road construction

	It has increased positively	It has decreased positively	As it is
Education			
Health			
Employment			

Education Schedule

1. Education

	Literate		Primary Education		Lower Secondary		Secondary		Higher Secondary	
Before Road	M	F	M	F	M	F	M	F	M	F
After Road										

2. Educational Institution

	Campus	Secondary School	Primary School
Before Road			
After Road			

3. Transportation facility to get education

	It was more/less	It has increased/decreased	As it is
Before Road			
After Road			

4. Enrolment of students in educational institution

	Girls			Boys		
	It was more/less	It has increased/decreased	As it is	It was more/less	It has increased/decreased	As it is
Before Road						
After Road						

5. Alternative facilities to get education

	It was more/less	It has increased/decreased	As it is
Before Road			
After Road			

6 Description about the nos of literate/illiterate.

	It was more/less	It has increased/decreased	As it is
Before Road			
After Road			

7. Change in expenditure for education (amount per year)

	It was more/less	It has increased/decreased	As it is
Before Road			
After Road			

8. Change in time saving

	It was more/less	It has increased/decreased	As it is
Before Road			
After Road			

9. Change in having food to go outside of home

	Taking food in home		Taking food in hotel		
	It was more/less	It has increased/decreased	As it is	It was more/less	It has increased/decreased
Before Road					
After Road					

9. **Change in facilitates to access up to institution**

\	It was more/less	It has increased/decreased	As it is
Before Road			
After Road			

Health Schedule:

1**. Health Institution:**

	Primary Health Centre	Health Post	Other Private Health Institution
Before Road			
After Road			

2. Change in health consciousness

	It was more/less	It has increased/decreased	As it is
Before Road			
After Road			

3. Status of improvement in personal health

	It was more/less	It has increased/decreased	As it is
Before Road			
After Road			

4. No. of your family in past 5 years

	It was more/less	It has increased/decreased	As it is
Before Road			
After Road			

5. **Any new disease after road construction**

	It was more/less	It has increased/decreased	As it is
Before Road			
After Road			

6. Change in place of treatment of disease

	In community			District Headquarter			Another Hospital within the country			Outside the country		
Before Road	More /Less	Inc/ Dec	More /Less	More/ Less	Inc/ Dec	More/ Less	More /Less	Inc/ Dec	More /Less	More/ Less	Inc/ Dec	More /Less
After Road												

7. Change in the process of treatment

	Traditional Process	Simple technology available in community	Outside of community with modern technology
Before Road			
After Road			

8. Change in technology to give birth of children in your family

	Traditional Process			Modern Technology		
	It was more/less	It has increased/decreased	As it is	It was more/less	It has increased/decreased	As it is
Before Road						
After Road						

Sanitation Schedule:

1. Process of water supply

	Traditional Source			Modern Source		
	It was more/less	It has increased/decreased	As it is	It was more/less	It has increased/decreased	As it is
Before Road						
After Road						

2. Change in consciousness about house sanitation

	It was More/Less	It has Increased/Decreased	As it is
Before Road			
After Road			

3. Description about Toilet

	In open Place			Water Sealed Toilet		
	It was more/less	It has increased/decreased	As it is	It was more/less	It has increased/decreased	As it is
Before Road						

Economic Schedule:

1. Description about land

	Khet (Ropani)	Bari Ropani)	Others
Before Road			
After Road			

2. Description about food sufficiency :

	< 3 months	3-6 month	6-9 month	9-12 month	corn for sale
Before Road					
After Road					

3. Occupation

	Agriculture	Business	Service	Labour	Others
Main Occupation					
Auxiliary Occupation					

4. Description about income per month

Source	Before Road	After Road	Remarks
	It was More/Less	It has Inc/Dec	Remarks
Agriculture			
Industry/Business			

Service			
Small Scale Industry			
Labour			
Animal Husbandry			
Others			

5. Saving Per Month

Source	Before Road	After Road	Remarks
	It was More/Less	It has Inc/Dec	Remarks
Medicine			
Fuel			
Education			
Entertainment			

6. Change in Housing

	Pakki	Semipakki	Kachhi	Labour	Others
Before Road					
After Road					

7. Use of agricultural means:

Means	Before Road	After Road	Remarks
	It was More/Less	It has Inc/Dec	Remarks
Hybrid Seed			
Chemical Fertilizer			

Pesticide			

8. Description about physical facilities

Means	Before Road	After Road	Remarks
	It was More/Less	It has Inc/Dec	Remarks
Water supply			
Sanitation			
Communication			
Transportation			
Electricity			

9. Description about household expenditure per month

Description	Before Road	After Road	Remarks
	It was More/Less	It has Inc/Dec	Remarks
Food Purchase			
Fuel			
Cloths			
Education			
Festival			
Drink/Smoke			
Marriage			
Medicine			
Transportation			

10. Assets

Description	Before Road	After Road	Remarks
	It was More/Less	It has Inc/Dec	Remarks
Repairing of House			
Land Purchasing			
Agriculture Instruments			
Investment in Industry			
Purchasing of Mortgage			

11. What type of change this road has made in the economic status of local people?

	Employment	Agricultural Production	Women Participation	Business	Cottage Industry
Before road					
After Road					

12. What type of change has been made in the house density in the road corridor?

	Households density		
Before road	Increased	Decreased	As it is
After Road	Increased	Decreased	As it is

13. Are you preferred to construct your house nearby the road side? In the road corridor?

Due to transportation facilities

Due to help for the children in getting education

Easy to treatment during sick period

To do business

14. What type of effect has been seen in the land pattern after the road construction <

Description	Increased	Decreased	As it is
Corn Production			
Deforestation			
Horticulture			
Animal Husbandry			

15. Is there any change in land value after the road construction?

Land Value before road construction (Per Ropani)

Land value after road construction (Per Ropani)

16. What type of change has been came in marketing dynamic after road construction?

Description	Increased	Decreased	As it is
Transportation of agriculture product			
Business			
Employment			
Industry			

17. What type of change has been came in the development of rural industry after road construction?

Description	Increased	Decreased	As it is
Pipe Industry			
Poultry Farm			
Rice Mill			
Saw Mill			

Miscellaneous:

a. As a whole, what are the benefits people are gaining after road construction?
b. What are the problems that arose in your society after road construction?
c. Some facts you should concentrate during the construction period of road but during that period nobody concentrated on it, now that are imparting the negative affects on your society. What may be these negative affect

Checklist for Key Informant Interview

Name of Key informant:

Destination:

Address

a. How green road is helping in the development of your society?
b. Could you tell me what types of positive impacts this road has imparted after the construction?
c. What are the negative impacts after road construction which passing through your community?
d. What are the negative impacts after road construction which passing through your community?
e. As a whole, what changes you are feeling in your community due to this constructed road?
f. Do you want to suggest me any things that may impart positive impact to community due to construction of road?

Check list for Discussion

Group Discussion with:

Number of Groups:

1. Need of road/ Green Road in rural areas.
2. Is road construction in rural area really helping the rural people?
3. What may be the negative impacts if any road which will pass through your village?
4. How does road support to this community to participate in various sectors/ functions?
5. Is road a factor to impacts on socio-economic sector?

Check List for Observation

1. Physical situation of observe road.
2. Environmental affects during the service period of the constructed road.
3. Participation of rural people's and women during the construction phase.
4. Observe on the level of interaction and interrelationship among the local people.
5. Impact on rural development, particularly on Environment, participation, social and economic Sectors.

APPENDICES

1. Discussion made with assistant Headmaster of BAL Bodh High School, Bhimdunga-4

Impact study of any rural development program is very complicated. It is to be understood that the time series data are not available in almost all VDC of Nepal. One of the method of this method for this study is panel discussion or discussion with village people in the study area, has been elaborated below.

Mr Uttam Khanal is assistant Headmaster and social worker, involved in many development activities, of Bhimdunga VDC, in his experience development has taken place in this VDC because about 90% of the households are getting electricity facility. No any student has to walk maximum of 30 minutes distance to get education for primary level. All the wards are linked by village road; health post has also been established. More than 50 numbers telephone lines are distributed etc.Some rural development programs were lunched in past and some are running at presently, due to the implementation of these programs some changes have occurs. Out of these changes there may be some positive changes and some may be negative changes. Out of many implemented development programs in past in this VDC, introduction of Green Road is one of the most important program. One interested story behind this road is like this:

As per Mr Khanal before the construction of this road, long long ago this road was historical road which connect the two destination points of Gorkha Darbar in Gorkha district and Hanumandhoka of Kathmandu district. As we know that Dashain is the main festival and holistic paba of Hindu. Nepali and Indian Hindus are celebrating the festivals with very encouragement. During the time of Dashai, the first and starting day of pray of goddess Mata Durga, Phulpati from Gorkha Durbar is sending to Hanuman Dhoka through this way. This is the ancient way from the period of Prithvinarayan Shah, one of the greatest emperors of Nepal. After leaving Gorkha district this ancient road enters in Jeevanpur VDC of Dhading district and lastly enter in Kathmandu district via Bhimdunga-Bhimsenthan . Therefore, this road is known as historical way. By the construction and upgrading of this way the related department has given their intension and has focused for the improvement of historical road.

Similarly, they replied that they are experiencing change in the living condition of the village people in housing. Sanitation, consumption, education, health etc. They said that the housing condition is changed from tinned or thatched roof to RCC building and are steel in progress. They are experiencing the change in sanitation condition by making toilets in their houses. Almost all the households are sending their children to school. They feel the change in health care of the family members because almost all the villagers were following the traditional method of treatment. People were not aware about disease which is very dangerous but now days villagers are well informed that Lama's (Traditional Doctors). Still some dependency on Lama is found in the community, especially in the illiterate and poor families. They feel the change in consumption like long ago they only use to eat meat sometimes or occasionally in a year but now in average they eat weekly or monthly and consumption of fruits has also been increased.

According to Mr Khanal, agricultural products from the Chhatredeurali, Jeevanpur and Bhimdunga (These are known as the agriculture poket area) area are directly transported to Kathmandu market. This road has directly affected on the daily life style of the people of this VDC. As per him, these are the positive impacts by this road that has imparted after the construction:

1. Direct impact on education, health and hygiene, economy, income etc.
2. To some extent personal development/human development has beeen occurred because the concept of co-operation and co-ordination has been found increased among the people of this society.
3. Communicational relation with headquarter has increased.
4. Development in the sector human resources has increased.
5. Direct impact on agricultural productivity.

Similarly, these are the negative impacts by this road that has imparted after the construction

1. Existing natural sources of drinking water has dry up earth cutting for the proposed road.
2. Lot of trees and bushes has cut during the construction period of road.

3. Some agricultural farm land and housing land along the road corridor has used for the road construction.
4. Due to vehicle movement on the earthen road air pollution and noise pollution is directly affecting the residents, who reside along the road side.
5. Probability of accident has increased along the road side.

As per him, the following improvements have come after the construction

1. Improvements in the sector of agricultural products like people are using breeding type of seeds in their fields and also they are using chemical fertilizers in their fields etc.
2. Now a day's nearly 15-20 trucks per day vegetables are supplying to Kathmandu from this area. Before road people of this area was unable to supply such type products.
3. Rice mills, pipe factory, saw-mill, furniture etc has established after road construction.
4. Housing pattern in study area has changed.
5. Stall and business activities in Bhimdunga Bazar area has increased.
6. Students of the VDC, who are getting higher education in Kathmandu, are directly up and down from their own houses.

ANNEX -1

List of Respondents

S.N	Date of interview	Name	Religion	Gender	Age	VDC	W.N	Remarks
1.	05/04/064	MrShambhu Bhattarai	Hindu	M	41	Bhimdunga	1	Secondary
2.	05/04/064	Mr Binod Giri	Hindu	M	38	Bhimdunga	1	Higher Education
3.	05/04/064	Dhurba Bhattarai	Hindu	M	42	Bhimdunga	1	literate
4.	05/04/064	Shiv Raj Bhattarai	Hindu	M	32	Bhimdunga	1	Higher Education
5.	05/04/064	Ram Bahadur Biswakarma	Hindu	M	40	Bhimdunga	1	literate
6.	05/04/064	Mrs Dewaki Bhattarai	Hindu	F	55	Bhimdunga	1	ILLETERATE
7.	05/04/064	Prakash Bhattarai	Hindu	M	35	Bhimdunga	1	Higher Education
8.	05/04/064	Rajendra Bhattarai	Hindu	M	57	Bhimdunga	1	illiterate
9.	05/04/064	Rishi Bhattarai	Hindu	M	45	Bhimdunga	1	Primary
10.	05/04/064	Navraj Pokhrel	Hindu	M	30	Bhimdunga	1	Higher Education
11.	05/04/064	Nirajan Bhattarai	Hindu	M	45	Bhimdunga	1	literate
12.	05/04/064	Mr Arjun Shrestha	Hindu	M	40	Bahal	4	Secondary
13.	05/04/064	Aaplang Maharjan	Hindu	M	50	Bahal	4	literate

14.	05/04/064	Dev. Narayan Maharjan	Hindu	M	35	Bahal	4	Secondary
15.	05/04/064	Ramesh Shrestha	Hindu	M	33	Bahal	4	literate
16.	05/04/064	Mr Mahesh Shrestha	Hindu	M	41	Bahal	4	secondary
17.	05/04/064	Gore Narayan Shrestha	Hindu	M	55	Bahal	4	Literate
18.	05/04/064	Jeet Narayan Maharjan	Hindu	M	59	Bahal	4	Literate
19.	05/04/064	Rabin Shrestha	Hindu	M	31	Bahal	4	Literate
20.	05/04/064	Kanchha Shrestha	Hindu	M	64	Bahal	4	Literate
21.	05/04/064	Badan Lama	Hindu	M	50	Bahal	4	Literate
22.	05/04/064	Raju Giri	Hindu	M	45	Bahal	4	Secondary
23.	05/04/064	Manoj Shrestha	Hindu	M	38	Bahal	4	Higher Education
24.	05/04/064	Krishna Shrestha	Hindu	M	37	Bahal	4	Secondary
25.	05/04/064	Gautam Shrestha	Hindu	M	35	Bahal	4	Secondary
26.	05/04/064	Ram Shrestha	Hindu	M	60	Bahal	4	Secondary
27.	05/04/064	MRS. D Rimal	Hindu	M	55	Bhimdunga	6	Literate
28.	05/04/064	Mr. B Luitel	Hindu	M	52	Bhimdunga	6	Secondary
29.	05/04/064	Mr Mukunda Rimal	Hindu	M	45		6	Bachelor
30.	05/04/064	Mr. Dinesh Giri	Hindu	M	30	Bhimdunga	6	Literate

31.	05/04/064	Mr. Saroj Pariyar	Hindu	M	45	Bhimdunga	6	Literate
32.	05/04/064	Mr. Raghunath Luitel	Hindu	M	48	Bhimdunga	6	Bachelor
33.	05/04/064	Rajiv Luitel	Hindu	M	30	Bhimdunga	6	Master
34.	05/04/064	Ramesh Giri	Hindu	M	26	Bhimdunga	6	Literate
35.	05/04/064	Mr. Bacchuram Baskota	Hindu	M	52	Kanpur	3	Literate
36.	05/04/064	Mr. Sitaram Khadka	Hindu	M	48	Kanpur	3	Literate
37.	05/04/064	Panch Kumar Khadka	Hindu	M	24	Khadkagaun	3	Literate
38.	05/04/064	Ram Hari Khadka	Hindu	M	42	Khadkagaun	3	Literate
39.	05/04/064	Thulakanchha Khatri	Hindu	M	55	Khadkagaun	3	Literate
40.	05/04/064	Narayan Budhathoki	Hindu	M	38	Kanpur	3	Literate
41.	05/04/064	Gokul Kunwar	Hindu	M	32	Kanpur	3	Intermediate
42.	05/04/064	Nakul Khadka	Hindu	M	35	Khadkagaun	3	Literate
43.	05/04/064	Ramesh Khadka	Hindu	M	28	Khadkagaun	3	Intermediate
44.	05/04/064	Ritthe Khatri	Hindu	M	48	Khadkagaun	3	literate
45.	05/04/064	Bishnu Budhathoki	Hindu	M	48	Kanpur	3	illiterate
46.	05/04/064	Buddha Shrestha	Hindu	M	52	Khadkagaun	3	literate

Annex-II

List of Key Informants

S.N	Date	Name	Designation	Institution
1		Mr. Babu Krishna Bhattarai	Ex. Member	
2		Mr Kancha Shrestha	Supervisor of B-L Road	Road Construction Committee
3		Mr Rameshor Bhattarai	Member	Sitapaila-Galchhi Road Construction Committee
			Secretary	VDC, Bhimdunga
4		Keshav Prasad Pokherel	Member	Sitapaila-Galchhi Road Construction Committee
			Chairman	

Annex-III

Rural Development Approach in Nepal

General Approach

Rural development is the key factor for human development, poverty alleviation and nation's development too. As a result of growing inequality between urban and rural areas, the attention of intellectual, administrators, politicians and planners have been drawn towards rural development by the introduction of Green Road in rural areas.

In the developing countries like, the total revenue is spent on regular budget and development budget mostly depends on loans and grants from rich countries and international donor agencies. The donors have their interest in investment. In the words of Hague " The standard development model adopted by the many developing countries central planning was industrialization and increase in the use of foreign technology, which resulted wide ranging disparity between urban ands rural people and rich and other peasant at the rural areas. Thus the model only failed on its mobilizing their own resources and shaping their own destinies." (Haque, 1977, p-2). Different models of rural development programs were launched during last five decades.

Tribhuvan Village Development Program

The first systematic effort at rural development was made in 1952 with the guidance and support of USA and India. The model was American pattern of Community development, which was in full swing in some of the developing countries at that time. It was the multi-faced program embracing almost every aspect of community need such as education, supply for agriculture, water supply, preventive health services, cottage industries and co-operative development. (Baral and Koirala, 1989; P-63). It was mix of both area and sectorial approach to promotion and improvements in the economic and social conditions, thereby resulting in raising the living conditions and change in the attitude of people (Biata, 1998; P-25)

Rural Development is one of the principle components of Nepal's plans. The first five years plan (1956-1960) put significant emphasis on rural development and program

was devided in three levels. First, Nucleus Development Areas were identified where the infrastructure facilities to be provided. Second the Dehat (Rural) Development Areas where in addition to the nucleus activities other provision such as improved seeds and fertilizer, horticulture and live stock development, basic social services (Primary School, First aid Kits and Drinking Water) To be provided were defined. Third, the intensive level called Village Development where scientific farming and techniques. Extension of health and maternity services, cottage industries and co-operatives were to be provided.

For the implementation of the program during first five-year plan the country was devided into 150 blocks. These were "block Advisory Committes" at their block level there were three geohraphical divisions into thirty-five administrative districts and arrangement of the "District Development committee" under the chairmanship of the Bada Hakim constituting representatives from local people, related line agencies and concern specialists. At the central level a new ministry of planning and development was formed and the village development officer of joint secretary level at the government ministry was appointed to administer, supervise, guide and control the activities under the village development program from the centre.

This program is expanded by additional Indian aid with the sympathy from the Neharu for Nepali Congress Party. After 1960, donor countries withdrew their support for many reasons and one reason was introduction of new party-less Panchayat System in country. After few years this program became Panchayat Development Program in Nepal.

Panchayat Development Program

With the introduction of new party-less Panchayat System in 1961, the rural development program received a new direction. Following this change the existing 35 administrative districts were phased out and 75 political districts were existing 35 administrative districts. It constituted of representatives from the introduced as administrative districts. It constituted of representatives from the villages and town panchayats. The Village Panchayats were set up in the rural areas covering approximately a population of two thousand each and town panchayat as urban areas. At the district level the Panchayat Development Officer was made the executive

secretary of the District Panchayat. Under him, a team of junior level technicians was formed in the field of engineering, agriculture, home science, co-operatives and Panchayats. In the village level Village Development Workers to work with the Village Panchayat and to help them in the plan formulation and program implementation. At the central level, there was a separate Ministry of Panchayat and under it a renamed department of Panchayat Development was formed.

Immediately following the political change two important policy announcement were made with important implications for rural development. First, the idea of co-operatives Development Bank was conceived and then established in 1963. The aim of establishment of this Bank was to institutionalize the rural credit system through village co-operative. Secondly, the land reform program of 1964 was launched for structural change on land. In 1965 special guidelines for decentralization of government functions were drawn up ny passing the local Administrative Act 1965. With a view to make more concentrated efforts in the areas of co-operatives function at the district levels were made also "(Baral and Koirala, 1983; p-66). Panchayat and under him a few district level functionaries of different development departments were formed.

Two other important innovations with rural development implecations took place during the decades of seventies. First, a new development implications took place during the Sector was created in 1965 besides the regular public and private sectors. And under this sectoral program the local institutions of village and district panchayats were provided graints in-aid by government for local self-help projects if they were partly supported by the local resources. Second, the Panchayat Development Land Tax was also introduced to enable the local institutions to generate resources for rural development works. This scheme, which was initially introduced in 12 Village Panchayats of Jhapa district and subsequently expanded to include two Village Panchayat of Morang district, was however suspended in 1978.

Sectoral Approach and Regional Planning Phase

During the forth plan period (1970-75) few other developments with rural development implications took place. As a follow up to the recommendations of the Administration Reform Commission, 1968 the Local Act 1971 was promulgated

replacing the Local Administration Act 1965. Its aim to Sharing power with local replacing the Local institutions for

- Mobilization of local resources for economic development
- Growth of the local leadership
- Democratization of administration.

This Act also received the CDO from role of secretary-ship of the district Panchayat and installed him as the chief representative of the government in the district with authority to handle even security-matters. Under this arrangement it was also implicity assumed that the development officers at the districts level would functions as unified team under the leadership of CDO.

Two other interesting developments occurred during the forth plan period. This plan announced two rural development projects. First were Jiri Multipurpose Development Project and second Remote Area Development Project.

Integrated Rural Development Projects (IRDP)

The fifth-five year plan (1976-80) was different in many aspects from the preceding plans. First, it deemphasized the investment in infrastructure and accorded topmost priority to the agriculture sector. Secondly, it put higher investment weight age on local development through Panchayat Sector against the nominal concern of the fourth plan in this area. Third, it unequivocally advocated ' "People Oriented" strategy in clear terms. It made the announcement of integrated rural development project. The first project in the form of integrated Rural Development was the integrated Hill Development Project (IRDP) in 1974 with Swiss assistance. The Rasuwa-Nuwakot Integrated Hill Development Project (R-N/IRDP) was second such as Sagarmatha Integrated Rural Development Project (S/IRDP), Koshi Hill Area Rural Development Project (? KHA/IRDP), Mahakal Hill Integreted Rural Development Project (MH/RDP), Rapti Integrated Rural Development Project (R/IRDP) and Karnali-Bheri Integrated Rural Development Project (K/IRDP).

The aims of IRDPs in Nepal are as follow: (Baral and Koirala, 1989; P-69) agriculture and related activities.

- Bringing equity in sharing the fruits of development.
- Fulfilling the basic minimum need of the people.
- Providing opportunities for employment on a sustained basis.
- Ensuring people's participation in all the aspects of the development program.
- Maintain ecological balance at all the project region.
- Ensuring a self-sustained type of development process through the development of rural institutions.
- Maintain the cultural heritage of the social environment.

Rural Access Program (RAP)

RAP is poverty alleviation program that aims to achieve the objective by improving the access of the poor and marginalized to the goods and services that they value. It's main goal is to provide more secure and sustainable rural livelihoods for poor and disadvantaged in hill area of Nepal. Access is not simply about new roads or transport services; it is about removing the barriers that prevent people using services, buying and selling goods or even visiting friends and family. RAP is implementing a program of physical infrastructure interventions-roads, trials and footbridges-combined with a series of additional activities designed to allow poor people to take advantage of the new livelihoods opportunities created. In addition to district level interventions RAP is also working at the central level to influence policy towards an equitable system of infrastructure planning, to be supportive of the decentralization process and to improve communications between stakeholders.

RAP follows the Green Roads approach, developed in Nepal in the yearly 1990s. The approach is labor-based and environmentally sound and incorporates:

- Maximum use of local labor, technology and resources.
- Careful planning of works to fit with labor availability and local practices.
- Detailed assessment and monitoring of the social and natural environments to mitigate negative impacts.

RAP also works to develop a maintenance culture and system in both DDC and community that will not only provide for sustainability of the infrastructure but also long-term employment for a proportion of the Road Building Groups. RAP works

closely with DOLIDAR to assist it to fulfill its dual roles of technical guidance and planning support. RAP is involved in a number of partnerships with other donors and programs in an effort to promote a common approach to poverty alleviation through improved access and to increase donor co-ordination.

Some Other Rural Development Programs:

- Integrated Panchayat Development Design (IPDP)
- Small Farmer's Development Program(SFDP)
- Small Area Development Program(SADF)
- Hill Transport Development Project(HTDP)
- Regional Intensive Development Program(RIDP)
- Local Development Department Project (LDDP)
- Production Credit For Rural Women (PCRW)