

CHAPETER – ONE

INTRODUCTION

1.1 Background

Rural Road are roads that connect a village to other villages, to the main road accessing to markets, or to connect related production or service to particular centers. Rural roads have been considered very important and play significant role in poverty reduction through linking rural farm product to market, improve their productivity, increase income level, access to farm input and other goods and service.

During the period of the Sixth and Seventh plans (1981-90), priority was given to the provision of minimum transport facilities to rural areas. A block grant was provided to the local self-governing bodies, such as the village and district panchayat(s), to plan and implement, among others, rural transport projects. These projects consisted of mule trails, foot tracks, and suspension and other types of small bridges in the hill and mountainous regions, whereas in the Terai they consisted of construction of culverts, drainage, and bullock-cart tracks. The projects were identified, along with other rural development project, by the local panchayat and implemented through the mobilization of free labour contributions. During 1985-90, over 20 percent of the local level projects implemented through local panchayat(s) were on rural infrastructural development (Paudyal, 1994).

Road access can reduce isolation; permit people to move quickly and easily; stimulate crop production and marketing activities; encourage public service such as health, education, and government administration; and increase the potential for the transfer of technology and change. The World Development Report 1994 shows that an important ingredient in the success of rural enterprise in Chain has been the delivery of a minimum package of transport, telecommunication, and power at the village level. Similarly, countries that have made concerted efforts to provide infrastructure in rural area, for example: Indonesia and Malaysia, have succeeded in reducing poverty dramatically (World Bank, 1994).

Conventionally, rural roads are defined as relatively low-cost, low traffic volume, and fair-weather roads, mostly traversing agriculture areas and essentially linking villages or clusters of villages and isolated communities amongst themselves or with an arterial road network (ESCAP, 1980). The Department of Roads has classified rural roads as district and village roads. The district roads are defined as those roads within the district which serve primarily to provide access to abutting land with little or no through movement. These roads give access to one or more villages the nearest market or higher classes of roads. Village roads include short, non-through roads linking single villages directly to district roads (DOR, 1994).

Roads are invariably the priority investment of the local bodies in Nepal. This is because the roads, if operational, will open a multitude of opportunities to enhance the livelihoods. In the past, the local bodies used to transfer budgets from other heads to road construction, but this practice has now been stopped as other sectors have also become vigilant. Historically, the rural communities created local roads and other necessary infrastructure using voluntary and paid local labour. After the re-establishment of multi-party democracy, heavy equipment such as dozers, excavators, etc. began to be used as more resources and authorities were channeled through the local bodies. Thus, there essentially are two broad technology groups-1) labour-based and 2) heavy equipment based. In the former, no heavy equipment is used in construction and maintenance, while in the latter; most works are done using heavy equipment. In between, there is a continuum of rural road construction. As of the year 2006, rural road length in Nepal is more than 20,000 kilometers of which about 3,000 kilometers are constructed following the Green Roads approach (Stern, 2006).

Rural roads play an important role in the rural development of Nepal, because Nepal's three fourth lands are covered with Hill and Mountains. It's a challenge to improve the standard of Nepal people through the rural infrastructure development. For the development of any country the development of rural community is 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 rural transport facilities are in important wing. And for this the construction of roads facilities is the first sign of development indicator. But the truth is that constructed road should be environmental-friendly, low-cost, and fair-weather earthen road.

Public investment in rural road creates opportunities to agriculture and non-agricultural sector by using labor and capital more efficiently. But significant knowledge gaps remain as to how opportunities provided by roads actually filter back into household outcome and their distributional consequences. Rural road investment are found to reduce poverty significantly through higher agricultural production, higher wages, lower input and transportation costs, and higher output price. Rural road also lead to higher girls and boys schooling. Road investments are pro-poor, meaning the gains are proportionately higher for the poor than for the non-poor. Road play an important role for overcoming the isolation of the villages. It provides a much needed opportunity for the village population to come in contact with other groups of the society, which in turn inculcates in them a sense of being a part of national main stream in its prosperity and progress. The areas here-to-fore inaccessible become easy to reach for administrative and welfare agencies particularly in tunes of natural calamities and relief-operations whenever needed.

1.2 Statement of the Problem

Nepal being a mountainous country, rural road holds an important infrastructural back up for rural development. Rural road creates bridge between rural settlement and urban areas. The modern way of constructing rural road to connect rural area to the district headquarters or market places creates social and economic empowerment among rural people. This might lead to changes in agricultural practices, cropping pattern and environmental issues such as soil erosion, deforestation, landslides and debris flow etc.

Considering the multidimensional impacts of the Rural Road 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 Rural Road constructed to use of an environment-friendly and maintenance technology that preserves the natural environment. It is a case study of Rural Road in Tanahun district, whose total length is 27km. 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 some district.

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.

This study intends to assess the impacts of Rural Road construction at Gajarkot VDC on socio-economic activities, income, employment, health, education etc. Similarly, at the same time environmental deterioration such as airpollution, noise pollution, depletion of natural resources, loss of bio-diversity etc. More specifically this study was concentrated on the following problems:

1. What is the socio-economic change among rural people after construction of Road?
2. What are the environmental impacts from road construction?
3. What is the impact of rural road in agriculture?
4. How the agricultural practices changes due to the accessibility of market after construction of road?

1.3 Objective of the Study

The general objective of the study is to find out the impact of road construction on social economy and environment in Gajarkot VDC of Tanahun district. The specific objectives of the study are as follow:

1. To assess socio-economic change of rural people after construction of road in the study Area
2. To analyze the impact of road on agriculture activities in the study Area.
3. To examine the impact of rural road on environment in the study Area.
4. To analyze the change in agricultural pattern in the study Area.

1.4 Significance / Rationale of the Study

This study basically focuses on the impacts of rural road in Gajarkot VDC and their impact on rural development. Several development programmes like Rural Electricity, Water supply, Education, Health, Employment, Income, socio-economic activities etc. are all important sector and fruitful but Rural Road in any VDC or district can give a best result for the overall development because roads development are the essential of the main gates. It opens the door of development.

Its impacts may be in economic, social, environment and also in demographic sector. In our country, millions of people reside in rural areas and their economic progress depends 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-cultural life. So, through the development of rural area the development of any nation can be done. The development of infrastructures at rural level is the backbone of our country. Therefore, we can say that the construction of Road 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 Rural Road and rural development, which is a tangible input to approaches, based on people participation development programme.
2. Provide insight to concerned institution and individual, who are interested in the field of rural community development.
3. Helpful to other researchers who like to conducts similar research in future.
4. Help to forecast and evaluate the effective and impacts of environment and natural resources management being implemented in rural development.
5. Provide insight to planner and policy-makers to design and formulate realistic policies for the rural development in future.

1.5 Limitation of the Study

The study has following limitations

-) This study was limited to rural road transport only.

-) The present research deals with the impact of Rural Road of Gajarkot VDC of Tanahun District only.
-) The study has generalized the impact of road in Gajarkot VDC by taking 60 household only.
-) 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.

1.6 Organization of the Study

Any study must have a proper organization. This present study also has some definite organization. This present study has been organized chapter wise. This study has been divided into five major chapters.

The first chapter i.e introduction deals with different aspects of the study consisting of background of the study, statement of the problem, objectives of the study, significance of the study, limitations of the study and organization of the study. The second chapter is literature review that includes the conceptual reviews and policy review as well as some previous studies. It also includes the gaps in existing literature related to topic. The third chapter is about the research methodology which has been used to conduct this study. It includes research design, Sampling design, sample size, sampling procedure, data collection methods and methods of data analysis are included here. The fourth chapter is about data processing and analysis. It includes introduction of study area and its demographic and socio-economic information. It also includes the analysis of data and interpretations of the results to fulfill the objectives. In the fifth or last chapter, conclusion of the study and the recommendations for the remedy of problems described in the statement of problem are included.

CHAPTRE – TWO

LITERATURE REVIEW

2.1 Conceptual Review

Nepal is a predominantly a mountainous country with about 77% of its area lie in the hill and mountain regions. The country is approximately rectangular in shape having an area of 147,181 square kilometers. The north-south length is up to 200km and the east-west length up to 800km long. It has the greatest variation in altitude on earth which ranges from 60m to 8848m a.s.l. The country consists of the snow and ice covered Himalaya in the north. The southern plain is about 30km wide and the altitude ranges from 75m to 280m high with fertile lowland (also swampy) which is known as Terai (Mulmi, 2009). The country has a great diversity in climate, vegetation, culture and religion. Transport infrastructure provides a basis for economic activities in the rural areas in the long term. But the environment consequences cannot be neglected only foreseeing long term economic benefit. Difficult topography and unstable geology make the road construction difficult in the rural hills of Nepal. Beside, the predominantly absolute poverty in the region realizes the essence of the appropriate approach in the rural road construction. With its approach of constructing rural roads considering environment and rural poverty alleviation measures, rural road development approach is proving to be a sustainable way of constructing rural roads. Environment friendly construction techniques, participatory and decentralization approach, optimum utilization of local resources, simple technology, local capacity building and self help efforts justified rural road as a best way of constructing rural roads in hill districts of Nepal.

Rural roads are the tertiary road system in total road network which provides accessibility for the rural habitations to market and other facility centres. In Nepal, during the last five decades, rural roads are being planned and programmed in the context of overall rural development, and tried to provide all weather connectivity with some level of achievement. A **rural highway** or **rural road** is a highway for which the Department of Rural Roads carries out construction, expansion, upkeep and repairs. Rural Road connectivity is a key component of rural development, since it

promotes access to economic and social services, thereby generating increased agricultural productivity, non-agriculture employment as well as non-agricultural productivity, which in turn expands rural growth opportunities and real income through which poverty can be reduced. This is proved by the following lines. A community without roads does not have a way out (A poor man, Juncal, Ecuador). If we get the road, we would get everything else, community centre, employment, post-office, telephones (A young woman, Little Bay, Jamaica). Many of the poor communities are isolated by distance, bad road conditions, lack of or broken bridges and inadequate transport. These conditions make it difficult for people to get their goods to market and themselves to place of work, to handle health emergencies, to send children to school, and to obtain public services (Narayan et al. 2000).

Rural Road Construction as a Development Approach

Development is the multi-dimensional phenomenon. That dimension includes: social and economic growth, level of education, level of health services, status of women, degree of modernization, level of nutrition, quality of housing, distribution of goods and services, access of communication etc. Development means that making a better life for everyone (Peet, 2009). Better life for people means sufficient food, good health, and essential place with security, and being dignity and respectable life. These are the only basic needs to human survival. Beyond these development covers material and cultural visions of different societies. The methods and purposes of development are subject to popular democratic decision making.

Development can be used for many different political purposes, including some, and perhaps most, that conflict with its essentially egalitarian ethic (a better life for all). In development, all the modern advances in science and technology, in democracy and social organization, in rationalized ethics and values, fuse into the single humanitarian project of deliberately and cooperatively producing a far better world for all. In this modernist tradition, the radical version of “development” is fundamentally different from the more conventional “economic growth.” Economic growth means achieving a more massive economy—producing more goods and services on the one side of the national account (gross domestic product—GDP)—and a larger total income on the other (gross national income—GNI (Peet, 2009). In term of conditions, development pays attention to the environments affected by economic

activity and growth, and it attends to the social consequences of production. Development analyses who controls the process of growth. If the growth process is controlled by a few powerful people rather than the many people, it is not development. Development is an optimistic and utopian, it means changing the world for better. So, development means starting change at the bottom rather than the top and it is often viewed as something very positive, it is also very important to consider the possible detrimental effects of development on the natural environment, different social groups and on the cohesion and stability of societies.

Modernization Theory

Modernization is a phased process; for example Rostow has five phases according to his theory of economic development for a particular society. Levy (Leavy, M., 1967) maintains that: “as time goes on, they and we will increasingly resemble one another because the patterns of modernization are such that the more highly modernized societies become, the more they resemble one another”. Modernization theory is influenced by western countries. It makes everyone's experienced with development copy the approaches and accomplishment of the west. Modernization theory argues that modern societies are more productive, children are better educated, and the needy receive more welfare. According to Smelser's (Smelser, 1964) analysis, modern societies have the particular feature of social structural differentiation, that is to say a clear definition of functions and political roles from national institutions. Smelser argues that although structural differentiation has increased the functional capacity of modern organizations, it has also created the problem of integration, and of coordinating the activities of the various new institutions.. In a political sense, Coleman stresses three main features of modern societies: a) Differentiation of political structure; b) Secularization of political culture -with the ethos of equality-, which c) Enhances the capacity of a society's political system.

Modernization is an imminent process due to its systematic and transformative nature, which builds change into the social system. Modernization theory regards the need to eliminate traditional values. Redfield 1965, distinguishes between the great traditional values (values of the elites), and the little tradition (values of the masses). Concerning external factors and conflict, the classical demonstrate a relative neglect

of external factors and conflict, in contrast to the greater attention to external factors and conflicts practiced by the new approach. Construction of the rural road which causes different kinds of modern technology enters in our village. Different constructive materials help to the increase in production, change in agricultural pattern, change in livelihood of society etc. it means modernization deconstruct and reconstruct in our societal understanding and also impact in cultural as well as political activities in our locality.

Poverty and Rural Roads

Poverty is a strong determinant of people or community. It contributes to physical weakness of people through lack of food, small weak body, malnutrition leading to low immune response; inability to pay for health services; isolation because of the inability to pay the cost of schooling and bicycle, inability to powerlessness because due to the lack of wealth and the poor have no voice. Thus poverty is a relative term and may be defined as an economic condition that is inadequate to meet basic needs of a person. Generally following types of poverty has been defined: (Kunwar, 2004)

1. Absolute poverty: It occurs when people fail to receive sufficient resources to support a minimum level of physical health and efficiency that is often expressed in terms of calories or nutritional values.
2. Relative poverty: It is the general standard of living in different societies culturally stated as being poor rather than some absolute level of deprivation.
3. Hardcore or Ultra poverty: It is the line below the absolute poverty line, its half by the gestation as the rule of thumb.

Poverty is a relationship between the essential needs of the people for survival and physical efficiency and their ability of satisfying them. Those who cannot satisfy their basic needs such as: feeding, clothing and shelter are called poor and those who have are non-poor. (HDR, 2005)

“A world that has 1 in 5 its people living object poverty is certainly not just and it is also dangerously unstable. This is particularly so when the poorest fifth of the world population have seen their share of global income fall to less than 2 % and the

richest fifth by contrast, have seen their share to 85 % such high levels of poverty are linked with spread of disease unrest and war migration, population growth and environmental degradation. If we are to leave safe world to the next generation, we must eradicate those massive levels of poverty from the world” (Clare, 1997).

Nepal is one of the least development countries in the world and 10th poorest nation in the world. Thirty two percent of the population lives below the poverty line in Nepal. The poverty line is estimated based on the annual consumption expenditure level below which the population of Nepal can be considered poor. DFID estimates that 50 % of the population lives on less than \$ 1 per day, with the status of fifth very poor. According to the World Bank estimate, 40-50% of the population lives below the poverty line. Over nine million are now below poverty line, most of them live in rural areas. The total poverty in Nepal according to Ninth plan and Nepal Living Standard Survey (NPC, 1996) was estimated at 42 %, with 24.9% and ultra poor 17.1%. The poverty in rural area was 44% and in urban region 23%. The revised estimate per capita GNP in terms of US \$ for the year 2002/03 is \$ 250 (CBS, 2005).

Rural poverty rate is the percentage of the rural population living below the national rural poverty line. The Poverty headcount ratio at rural poverty line (% of rural population) in Nepal was last reported at 27.40 in 2010, according to a World Bank report published in 2011. Poverty gap at rural poverty line is the mean shortfall from the poverty line (counting the non-poor as having zero shortfalls) as a percentage of the national rural poverty line. This measure reflects the depth of poverty as well as its incidence. The Poverty gap at rural poverty line (%) in Nepal was last reported at 6 in 2010, according to a World Bank report published in 2011 (World Bank, 2011). Since Rural Road construction is directly related to the issues of nutrition, agricultural parameter, infrastructure development support and income generating activities, poverty dimension is also accepted as an issue.

Roadside villages are confronted with an increase in land appropriation, prostitution, highway robbery, accidents where pedestrians are killed by cars, and general social disruption (Porter, 1997). A comparative study in Uganda, Zambia, and Nepal could find no solid links between improved road conditions and poverty alleviation, despite government intentions in that direction (Robinson and Stiedl, 2001). Decisions on where and how to invest in roads are often made on the wrong

grounds. Roads often deteriorate quickly, because, for several reasons, the management of maintenance is more complex than the management of construction. The affordability of maintenance is often not considered when a network is constructed (ibid). In Nigeria the trajectories of new roads are influenced by politicians who arrange road access for areas where they are angling for support (Porter, 1997). A critical World Bank report sums up the social problems: the bypassed community, the community split by a road, culture shock, reduced convenience of traditional modes of transport, resettlement of people making way for road construction, the introduction of new diseases and alcohol abuse to indigenous peoples, loss of a traditional sense of identity, violation of traditionally exercised land rights, damage to cultural heritage.

In many circles, the beneficial effect of new roads on the development of less-developed countries goes largely unquestioned. Development agencies aim to bring about positive effects through construction of new roads and repair of dilapidated roads. An Asian Development Bank (ADB) recommendation of a proposed loan for work on primary roads in Cambodia calls road repair 'top priority'. It claims that the beneficiaries will be: 'farmers in rural areas; consumers in urban areas; truckers, bus and taxi operators, and other road users; traders involved with domestic commerce; local contractors; and people employed in tourism and supporting industries' (ADB 1999). The Cambodian Ministry of Planning expects poor households to profit the most. Broadened roads are seen as improving safety for cyclists and 'non-traffic related uses made of roads in Cambodia, and in many other parts of Southeast Asia. These include socializing, crop processing, temporary storage and flood refuge for both humans and livestock.' (ADB, 1999) The recommendation of a proposed loan to Indonesia expresses similar optimism that rehabilitated roads and bridges will 'facilitate economic recovery' after the Asian Crisis of 1997. 'The Project will support pro-poor growth by providing the poor with employment opportunities and better access to markets, and health and education facilities' (ADB, 2000).

2.2 Review of Previous Studies

Ing-Britt Trankell (1993) studied the socio-economic effects of the upgrading of a dust road to an all-weather road in the Lao People's Democratic Republic.

Logging had already proved to have an adverse effect on hunting, gathering, and swidden and sawah cultivation, and these effects were amplified by the road construction. Other undesirable effects were a rise in land prices, a more pronounced differentiation of landholding, and a growing proportion of landless peasants near the road. The roads were designed for long-distance transport and did not serve short distance needs, such as those related to the carrying of water to the house by women, or going to the fields. In two years' time, a predominantly subsistence economy changed into an economy based on market relations. Informal cooperation in the village was replaced by a system of paid employment.

Reed Wadley (1998) presents the effects of a road in West Kalimantan. For a while, the Indonesian government postponed road construction in order to keep the local population isolated, until the national government had achieved firmer military and political control over the area, which was considered rebellious. At that point, using inside information on the route the planned road was to take, the local elite bought deeded land from a long house in order to speculate on price increases of the land. Every time road building operations passed through a ritually prohibited area, construction was halted while a special ritual to allow work to proceed was performed. When the road was finally in place, it turned out that people still often preferred the old trails and the river, because of the lack of bridges and the muddy condition of the road. The new road reinforced the frontier nature of Kapuas Hulu and threatened the surrounding forest reserve. With all the newcomers and loggers, increased insecurity about land tenure of forestland spurred locals to accelerate the conversion of forest to rubber and other tree crops, which the government recognizes as markers of property claims.

A little-known masterpiece is SeahChee Meow's (1978) overview of road infrastructure in ASEAN countries. She nicely sums up the premises under lying most of the articles in this issue. An important point, deviating from the good-for-all developmental perspective, is that the various agencies involved have conflicting as well as complementary interests. In the ASEAN countries, these agencies are commonly those involved in budget allocation, revenue generation, public works, communications, planning, public housing, public utilities, and defense, not to

mention the many vested interests of non-government parties. The agencies do not always function harmoniously.

Nepal is a small country with 3633 Village Development Committees (VDCs) and 130 municipalities. Almost all villages and municipalities are rural in character. The livelihood of more than 74% of population in Nepal depends on agriculture. Different studies have been shown about 45% of its population the development of the nation is impossible without infrastructure development in rural areas. One of the causes of past development approach couldn't improve living standard of rural people through the agriculture sector. The main reason for this is absence of rural infrastructure 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.

Rural Development in Nepal continues to be one of the major programs, the government intends to continue and expand for the upliftment of rural people. The program has been lent with five major objectives namely increased productivity of the village economy, increasing employment opportunities, enhancing the level and coverage of social services, improving distributive justice and restoring and maintaining ecological balance in the country. Deriving from these objectives, a program of rural development is to consist of all the activities related there with. This would normally consist of activities in agriculture and non-agrarian development.

Bista (2002) Suggests that in the light of experience gained and in recognition of the socio-political consequences of growing numbers of rural poor, planners, in developing countries including Nepal need to reconsider their rural development strategies and policies. He suggests future strategies must entail linkage at the macroeconomic level between 3 elements. These are: i) the launching of economic activities to improve productivity and generate employment and incomes together with the development of necessary infrastructure; ii) the provision of social facilities and services, such as in education and health in a long term perspective, and iii) the establishment of institutional infrastructure to permit the participation of local communities in the development effort and for the effective management and implementation of programs. He also writes that with the stimulation of agricultural activity, rural roads have become critical to marketing. In fact, farmers mention road

as the major priority for the future action. The present state of transport infrastructure should therefore be improved to stimulate the growth of the scattered mountain niches connecting them with the main road. However, support for such rural roads needs to include environment friendly measures.

Road development is a capital-intensive venture in Nepal. More than 80 % of the area in Nepal is geologically fragile hill and mountain. Human settlement is scattered and sporadic. Poverty incidence is very high in the rural countryside. Education and health facility and standard is very low in the rural region. Non-agriculture activity is very quiet little. Road development in rural countryside has been a priority sector in Nepal for decades. Politicians and planner all alike have given emphasis in developing sufficient road network in rural areas of Nepal. Almost 70% of the annual allocation from the government in rural development has been earmarked for road building. A 20 years Agriculture Perspective Plan (APP) has identified the lack of adequate road network in rural area as the main hurdle in boosting agriculture development. Therefore, the APP has made recommendation of building additional 6200 km of roads in 12 years' time period (from 1996) in Nepal and estimated 20% of the incremental allocation for APP implementation for roads construction and maintenance. The total cost of incremental road investment has been estimated at NRs 12 billion at the rate of yearly investment of NRs 1 billion for building 500km of road each year. From the beginning of Ninth Plan 1996-2001, government started implementing APP as its main economic plan. Thus roads have received high importance for agriculture development in Nepal from the time of APP formulation (Upadhya, 2002).

The history of the rural infrastructure development efforts in Nepal dates back to time immorial. However more systematic efforts were lunched only after 1950, since then a variety of rural development model has been introduced. The most one are Tribhuvan Village Development Model, Panchayat Development Model and District Development Plan (Sherestha, 1974).

The development in infrastructure may lead towards the economic prosperity as well as it may result in massive and futile spending too in some cases. According to World Bank study, a 1% increase in infrastructure stock is associated with a 1% increase in GDP (Goldman Sachs 2008). A recent study by Guasnh 2004, 2-3Guash

found that a 1% increase in telephone line can result in a 0.2 % increase in GDP. Unfortunately, causality also occurs in the reverse, as investment in infrastructure is also a function of economic growth, which results in a demand for new service and projects. Canning and Bennathan use panel data on infrastructure stocks to estimate an aggregate production function, and then calculate the marginal returns of different type of infrastructure on output. They find the economic returns to infrastructure are 30-40% for telecommunications, 40% for power generation, and 80% for roads, again higher in poor countries (Canning and Bennathan, 2000).

During the late 1970s, the Lamosangu-Jiri Road Project began as one of the first rural project within the context of the Integrated Hill Development Project (IHDP) in Sindhupalchowk and Dolkha Districts. Its design paid particular attention to having a minimal negative environment impact (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 concentration on upgrading foot trails 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).

Singh, (1974) carried a research on “Economic Impact of Mahendra Rajmarg” Eastern sector. Regarding the study the author says the present study is not concerned with such questions whether the cost of linking diverse regions can be justified by the benefits. We start from the premise that Nepal as any other developing countries envisages substantial economic political and social benefits as a result of better transportation.

The objective was to follow the approach of before and after analysis, i.e. to compare the situation prevailing before and after the construction of the Highway. The impact study was divided into following three categories a) Direct Impact b) Short Term impact and c) Long Term Impact. The main findings of this study has that the development of this road had directly linked the possibilities of development of agriculture industry and soon.

Koirala (2011), made a study on the “Economic Analysis of Local Government Investment in Rural Roads: Reducing Poverty through Managing Climate and environment Risks.” He concluded of the following findings:

-) Road is a number one priority at the local level and it is rightly so considering the spatial nature of poverty in rural areas.
-) Labour based roads are more pro-poor and can provide self –targeted employment to the poor. Hence, rural road construction can be made a pro-poor initiative by using labour based technology.
-) Use of equipment based technology in road construction has a strong association with unsustainable roads-high gradient in several spells, no water draining structures, no protection structures, and high environmental costs, about 5 times more prone to landslides compared to labour-based roads.

Management of road infrastructure in the rural areas after it is built has always been an issue to tackle properly. Local road users groups which were formed for construction are managing the operation and maintenance of some roads in Nepal. Palpa, Dhading, Dolakha, Parbat, Rupandehi, Ilam, are some of the districts where local road users groups are formed to manage maintenance by collecting tolls from the vehicle plying in some of the roads. But the toll amount collected in a year by such roads is not found enough for proper maintenance especially when there is a big damage. Otherwise in the rest of the roads in Nepal are left to fate of nature care for management until there is an allocation made from somewhere maybe HMG, Local Bodies or else for that particular fortunate district or the road (Upadhya, 2002).

LGCDP, (2011), study on rural roads of Makwanpur and Dolakha district has shown labor based technologies as environment friendly and pro-poor with economic returns of 30% more than equipment based technology, but the technology is awfully slow and expensive.

Development of Rural road should have two considerations – environmental and social. The basic intention of environmental consideration is to develop the best possible rural road in the given environmental settings. Environmental consideration basically addresses two aspects: risks or threats, which are the likely damages to the environmental quality, services and natural wealth; and opportunity or potentially of

the given natural setting for road works to harness the same. Environmental considerations should therefore, focus on avoiding or minimizing damages and, at the same time, promoting sensible use of opportunities to improve the natural environment. The social consideration in road development is associated with promoting broader social development benefits including those not addressed by forces of market economy and to discourage any social harms and dis-benefits from the road. The rural road as an infrastructure may have different kind of social impacts on the local communities at different time horizons. At the beginning road building exercise may have to intervene in the prevailing social tranquility and processes such as by acquiring local land, property and by negatively affecting other livelihood resources (Technical Manual, 2012 published by Transportation Research Boards).

Rural Nepal has always been primarily interested in access to transport infrastructure. In many cases, this means the difference between life and death for villagers. A mother who can't be taken to hospital for a complicated pregnancy can die; farmer can't sell perishables like milk and vegetables because they can't get it to market. True, roads might also bring negative side effects. But in the minds of ordinary Nepalese, the benefits far outweigh them and there is great public pressure on politicians and other forces to deliver roads to their districts. Villagers have made a correlation between access and services. For examples, doctors are often absent in hospitals in districts without roads; the quality of schools is lower when there are no roads; and there are fewer investments in rural areas which aren't connected to the highway grid. So without roads, there are no jobs; hence, there is no development. The assessment made under the Millennium Development Goals (MDG) indicated the need for 30,000km of rural roads by 2015. The country has about 22,000km of rural road. However, road standards vary significantly. Less than half are motor able and of this only about 60% are categorized as "all-weather." Hence a large population is unfortunately still far from having access to reliable transport systems. And even though Switzerland and its partners have improved hundreds of thousands of lives, there are still many thousands more waiting to be made better. Consequently, there is a significant need for extension of the road network to provide a majority of the people with accessibility to road-heads within a reasonable time (say, within less than 2 hrs. in Terai and 4 hrs. in the hills\mountains). To this end, the Government of Nepal targets building 2000km of rural roads in the coming four years, out of which

Switzerland will help build about 700km. at the same time, with the gradual expansion of national highway connectivity of more and more rural settlements to the road transport network (eastasia@deza.admin.ch).

Rural transport creates access to services and markets for people. It is a catalyst for rural economic development as rural-urban linkage provides people with new opportunities for employment and enterprising initiatives. The development challenge is to enable socially and economically disadvantaged people to be prepared for the emerging opportunities and to get equal benefit.

Roads are lifelines for rural people. However, it should not be developed indiscriminately in rural Nepal, since the adverse impact of roads can sometimes cost beyond remediation. The sustainability of the rural roads thus has to be seriously taken into consideration so that the investment made on the sector is not futile and the adverse impact- economic or social-is minimized.

Thus, rural road has great impacts over the socio cultural conditions of the people as well as their economic status too. Besides these they also affect our environment. Nepal, as being a developing country has great need of rural road but its construction may have negatives effects upon environment. So as being a master's student of Rural Development, I got an idea to have a social research on the rural road that explores the people view on the rural road over their socioeconomic condition and livelihood as well as its negative impacts on the environment.

From above mentioned literature focus on the economic activities, social facilities and services stimulation of agricultural activities, development of infrastructure, linking diversity, correlation between assess and road transport network. But, I found the gap between impacts of agricultural activities, socio-economic change and change in agricultural pattern as well as environmental effect for the construction of rural road. So, I tried to field of these gaps in my research and related literature and to make a conclusion.

CHAPTER – THREE

RESEARCH METHODOLOGY

3.1 Research Design

Descriptive and exploratory research design is used in the study. The major purpose of the descriptive research design is to describe the impact of Rural Road in Gajarkot VDC of Tanahun District. 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 economic phenomenon, demographic calculation, and environmental factors etc. are collected based on existing situation.

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

3.2 Nature and Source of Data

Primary data were collected in Interview, 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 have also generated from fragmentary sources, project document, village and district profiles, census data, routine national / regional statistics, published book, journals, research reports etc. have consulted. Unpublished materials such as Rural Roads construction guideline, database and website have used as per need of the study. The collected data and fact are particularly in two natures are qualitative and quantitative, which help to fulfill the requirement of the study, include as a major part to achieving its all the objectives of the dissertation.

3.3 Rationale for the Selection of the Study Area

The studies have focused in Gajarkot VDC of Tahahun district. It lies in hilly region. It has 3 electoral zone, 3 municipalities and 39 VDCs. The total population of VDC is 5385. Presently, in Nepal construction of Rural Road is going to be familiar because such type of road construction represents effective in accessible in rural areas, helping in the socio-economic level, labour based phase wise construction and environmental friendly. The selected road is near to Damauli and no such type of study has been done till now. Selection of this road has been made with the intension of exploring the specific impact for the development in rural areas. This Rural Road have supposed to represent the average characteristics of the rest Rural Road of the development region and the country as a whole. Particularly, the Bhimad-Gajarkot Rural Road has highly impacted in that rural area is selected for the study.

This road starts from Bhimad and ends at Gajarkot VDC of Tanahun district. The length of road is 27 km. This road touches Bhimad, Samung, Majakote, Ghiring and Gajarkot VDCs. But, only Gajarkot VDC have selected purposively since this VDC covers a length of 7 km and involves four wards.

3.4 The Population and Sampling

The studies have selected four wards of Gajarkot VDC purposively. The priority of selection has made on the basis of ward those touches the Bhimad-Gajarkot road. Therefore, among the nine wards of Gajarkot VDC, ward number 4, 6, 7 and 8 have been selected as a sample for study. The selection of the informants for study have based on socio-economic consideration. Different information has taken under different criteria that is, occupational change, change in living standards, impact of road etc.

Out of 107 household in ward number 4 only twelve households are selected along the road. As there are 119 households in ward 6, but only eighteen households has been selected for sampling. Likewise, above 126 households have present in ward number 7, but only fifteen households have selected. Similarly, there are 87 households in ward number 8, but only fifteen households have been selected. Therefore, out of 439 households in above mentioned four wards of Gajarkot VDCs

of Tanahun district only 60 household were sampled as a respondent for the study. These samples have selected purposively which touches the road. On the basis of following criteria these household have been sampled as:

- Purposively identified VDC, ward and number of households.
- Conveniently sampled household within the road corridor which touches with Bhimad-Gajarkot road have selected as a respondent.
- Anyone can be responded however less than 15 years old are not accepted as a responded.

Sampling Procedure of the study is as follows:

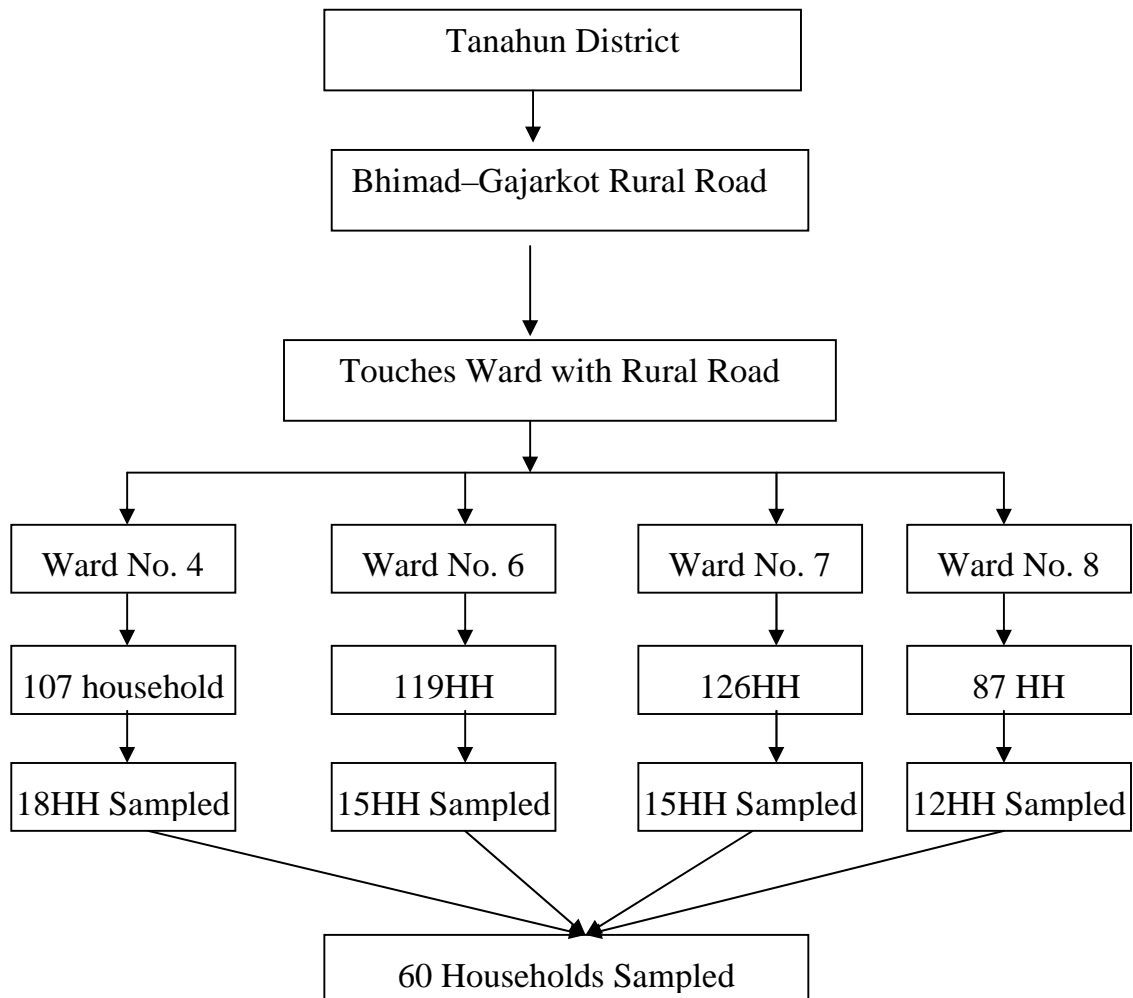


Figure 1: Flow-Diagram for Sampling Process

3.5 Data Collection Technique and Tools

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.

3.5.1 Interview Schedule

A set of questions have prepared and then directly to the participation of these questionnaire had been asked and noted what they respond. The group members will be select randomly ascending to the above sampling size and the actual reflections of the participations have focus on the table, which deals the impact of the Rural Road in rural development.

3.5.2 Key Information Interview

This technique has conducted to collect primary data. Key informants have interviewed semi-structurally. By applying checklist, the information about socio-economic condition, existing condition and impacts in society were collected. Other information have provided by the villagers have verified through key informants interview. The respondents were asked based on checklist developed. Altogether 60 respondents were interviewed. Interview was held with the community key personality such as local technicians, leaders for knowing principal issues such as historical background, people's participation, benefit sharing system, elder people, VDC secretary etc. Answer received from interview were used for background information and for triangulation of data collected from other sources.

3.5.3 Focus 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 to participate in various functions, constructed road in rural area really helping the rural people etc. were collected. The discussion was conducted

based on semi-structured questionnaire. Data/information received from other sources.

3.5.4 Observation

Observation is also one of the primary methods used in acquiring information about the socio-economic condition of the study area. During the study period observation was carried-out. Generally, participation 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 Method of Data Processing and Analysis

In this study, the collected data have been edited, coded, tabulated and checked to remove possible errors during the fieldwork evaluation. Then, tried to match the responses of each of the respondents with the questions and the topic discuss during the interview. This helped to analyze research data appropriately.

Basically, quantitative data were categorized and presented as per need of the study. In order to analyze the data, simple statistical tools such as frequency and percentage is used. Similarly, the data was also present and analysis by the help of bar diagram and pie chart Likewise, mainly Microsoft Word and Microsoft Excel were also used as computer facilities. Interpretations have been made on the basis of results, which was assisted by qualitative data / information available from both primary and secondary sources.

CHAPTER –IV

DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.1 Introduction to Study Area

4.1.1 Geographical Setting

Tanahun is a district of Western Development Region. It lies in southern east part of Gandaki zone. It lies between $83^{\circ} 75''$ to $84^{\circ} 34''$ east longitude and $27^{\circ} 3''$ to $28^{\circ} 5''$ north latitude. It covers a total area of 1546 sq.km. That is 1.05 % of Nepal and consists mainly of Mahabharat Range and mid hills. Its altitude ranges from 240 – 2325 m from the mean sea level.

The study site Gajarkot VDC lies southern western corner of Tanahun district. Its border is attached with three districts viz. Palpa in south, Syangja in west, and Nawalparasi in south east side where as its northern side is surrounded by Ghrinig sundhara and Kihu VDC of Tanahun district.



Figure 2: Map of Tanahun District

4.1.2 Political and Administrative Division

In political division, Tanahun has been divided into 3 electoral constituencies, 13 ilakas, 3 municipalities and 39 Village Development Committees. Damauli is its headquarters that lies in Vyas municipality. When the construction of rural road the political, awareness is increase and sharing of power also be widened in this since the populace of this area are modernized. Gajarkot VDC is administratively divided into 9 wards and among them; ward no. 4,6,7,8 is the study site.

4.1.3 Population Statistics

According to CBS census 2012, the population statistics of Tanahun is presented in table no. 1

Table 1: Population Statistics of Tanahun

Total Household	78309
Total Population	323288
Male population	143410
Female Population	179878
Average family size	4.13
Sex ratio	79.7
Population Density	209

(Source: CBS, 2012)

In above table the total household of Tanahun district 78309. The male population of this districts 143410 and female 179878 including male and female the total population is 323278. It clearly shows that female is greater number than that of male. In the total household the average family size is 4.13.

4.1.4 Socio – Cultural Division

Mostly compact settlements is seen in the market area i.e. around Damauli where as sparse settlement in and around the hilly areas. The population distribution of Tanahun according to caste is presented in table no. 2.

Table 2: Population Distribution According to Caste

Caste	Population	Percentage
Brahman	39875	12.33
Chhetri	28619	8.85
Newar	20901	6.46
Gurung	39832	12.32
Magar	98586	30.49
Thakuri	8154	2.52
Kaami	21035	6.50
Damai	11829	3.65
Sarki	16545	5.11
Darai	4697	1.45
Others	33215	10.27
Total	323288	100

(Source: CBS, 2012)

In above table, the total population 323288 these are distributed into different caste and ethnic groups contain Brahman, Chhetri, Newar, Gurung, Magar, Thakuri, Kaami, Damai, Sarki, Darai and others. Among all of these castes Magar have higher percentage in 30.49. Similarly, Brahmin and Gurung are distributed nearly equal percentage 12.33 and 12.32. The distribution of Thakuri and Darai are low percentage only 2.52 and 1.45 respectively. But due to the impact of modern society all of the caste functions are similar like as intercaste marriage etc which decrease the discrimination level of different caste systems. So, it conclude that the traditional society change to the modernization.

4.1.5 Occupational Status

The occupational status of the Tanahun according to CBS census 2011 is divided into four groups having opportunities, agriculture, labour and others given in below table.

Table 3: Occupational Status

	Having opportunities	Agriculture	Labour	Others
Nepal	58.2	51.4	32.1	16.5
Tanahun	60	59.1	22.8	18.1

(Source: CBS, 2012)

The occupational status of the Tanahun according to CBS census 2011 is 60 % of total populations are getting opportunities whereas 40 % are unemployed. Among the 60 % population, i.e. 193973, 59.1 % are engaged in agriculture, 22.8% are engaged in labour and daily wages work whereas remaining 18.1 % are engaged in other jobs. The comparison of Nepal and Tanahun district generally Tanahun having more opportunity in other places according to census 2011. The occupational status of this area is increase due to enter the modern technology which increase opportunity of the people.

4.1.6 Land Holding

Land is very important natural resources for the study area as many people depends on agriculture small and marginal farmer dominats the study Area. According to CBS census 2011, the land acquisition of the people of Tanahun is presented in table no.4

Table 4: Land Acquisition

Land acquisition	No. of households
Landless	402
< 1 ha	48544
1 – 5 ha	29236
> 5 ha	127

(Source: CBS, 2012)

In above table shows that, the number of landless household are 402. 48544 households have less than 1ha land acquisition. Similarly, 29236 household hold 1-5ha and 127 have rich the land resources which consumes greater than 5ha land acquisition.

4.1.7 Development Parameters

Various development parameters of Tanahun on basis of CBS are presented in table no 5. This shows that Tanahun district is above average in terms of HDI of the country. Literacy percentage is high compared to the other districts.

Table 5: Development Parameters

HDI	0.524
Life expectancy	68.79
Literacy Percentage	84 %
Below poverty line	42 %

(Source: CBS, 2012)

In above table shows that, the HDI in Tanahun districts is 0.524. The life expectancy of this districts is 68.79, and literacy percentage is high 84% this literacy percentage is greater than compared to other districts of Nepal. Similarly, the population in below poverty line is 42%.

4.2 Household Members' Profile

The total number of including household is 439. Among these entire household only 60 households are taken in this study and collect the information on the basis of gender, age and educational qualification.

4.2.1 Age and Sex Structure

The total number of people is 300. Out of these 300 populace the age of 0-14 years age groups are 96. Out of these 96, 49 are male and 47 female. Likewise, 15-59 years age groups are 159. Out of these 159, 71 are male and 88 female. And, 60 years above age group are 45, Out of these 18 are male and 27 female are shown in below table.

Table 6: Age and Sex Structure

S. No.	Age group	No. of people			% of people
		Male	Female	Total	
1	0-14 years	49	47	96	29
2	15-59 Years	71	88	159	50
3	60 years and above	18	27	45	21
	Total	138	162	300	100

(Source: Field Survey, 2014)

The aforementioned table no. 6 exhibits total number of people that is selected for this study by sex and age structure. As the table shows out of 300 selected people, almost 50% people are of 15-59 years of age group, 29% people are of 0-14 years of age group where as 21% people are of 60 years or above. It even shows the proportional distribution of active people (15-59 years) and dependent people (0-14 years and 60 years or above) and unequal distribution of male and female population as total number of male is 138 and female is 162. Majority of the respondents were between the age group 15 to 59 years of old.

4.2.2 Educational Status

In regards to the educational status of the members of the selected household, most of them belong to upto the level of SLC. Still, 8% of them are found to be illiterate where as 33 % of the total populations are small children who have not started going to school and under SLC. Out of the total members 26% people have the upto SLC. Out of total members 22% people have the qualification of bachelor's level and 11% have got education upto master's level.

Table 7: Educational Status

S. No.	Educational qualification	No. of people	% of total population
1	Illiterate	24	8
2	under SLC	99	33
3	Upto SLC	77	26
4	Upto Bachelors	68	22
5	Masters	32	11
	Total	300	100

(Source: Field Survey, 2014)

4.2.3 Occupational Status

Among the members with productive age group, the major occupation is found to be agriculture (40 %) followed by foreign employment (34%). The data reveals that agriculture is the main occupation of the people from that region. However, foreign employment is also found to be the significant sector of occupation. Along with agriculture and foreign employment, some of the people are engaged on civil service and other activities too. Hence, the pie chart reflects the varieties of occupations adopted by the people of selected area.

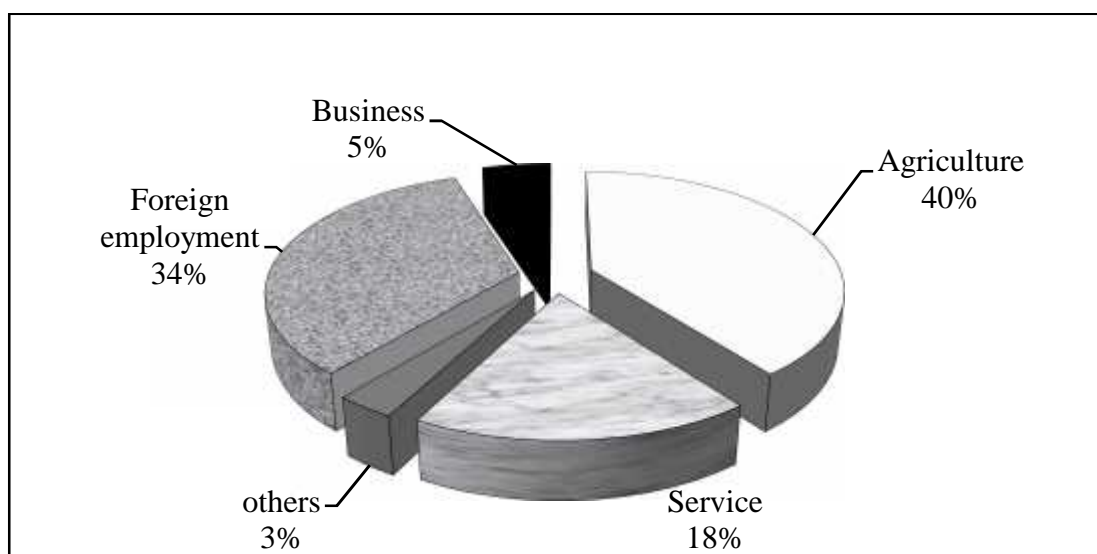


Figure 3: Occupational status

4.2.4 Marital Status

In regards to the marital status of the household members, 48% are married and 45% are unmarried. As the bar chart further shows nearly 6% and 1% people are living a widowed and divorced life respectively. Including divorced and widowed members, the unmarried population is more than the married population of the research area.

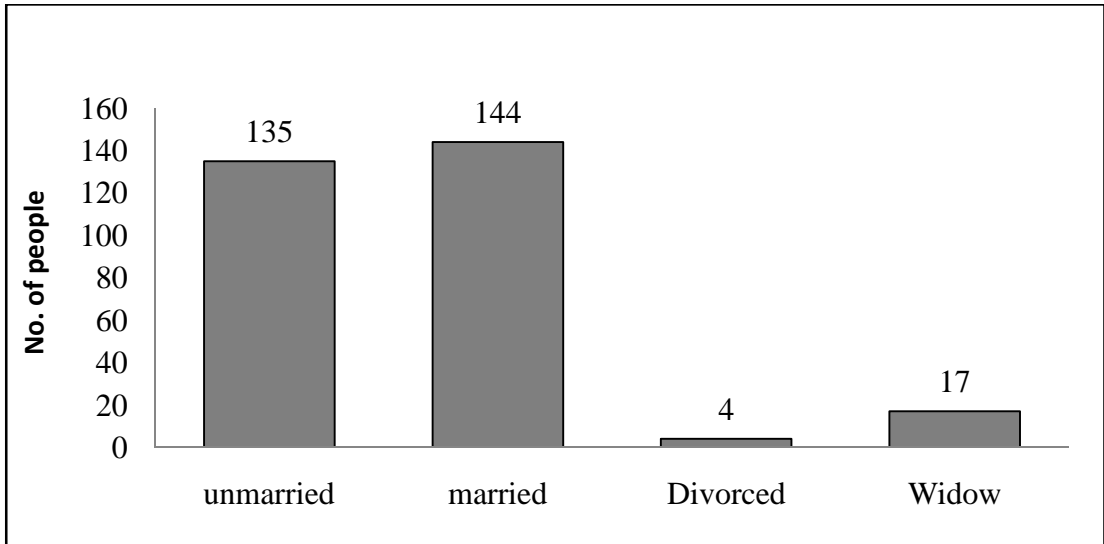


Figure 4: Marital Status

4.2.5 Caste – Ethnicity Distribution

The research area is dominated by Brahmins and Chhetris in terms of caste and ethnicity. Among the household members Hill Janajati are 24%. Respondents from Dalit community comprise of 31% whereas respondents from Brahmins and Chhetris are 45%. If we analyze on the basis of the given pie chart; with the existence of Dalits, Ethnic groups and Brahmins and Chhetris in the community, one can assume that there is mixed religion, culture and social structure instead of having the absolute domination of anyone caste and ethnicity in the research area.

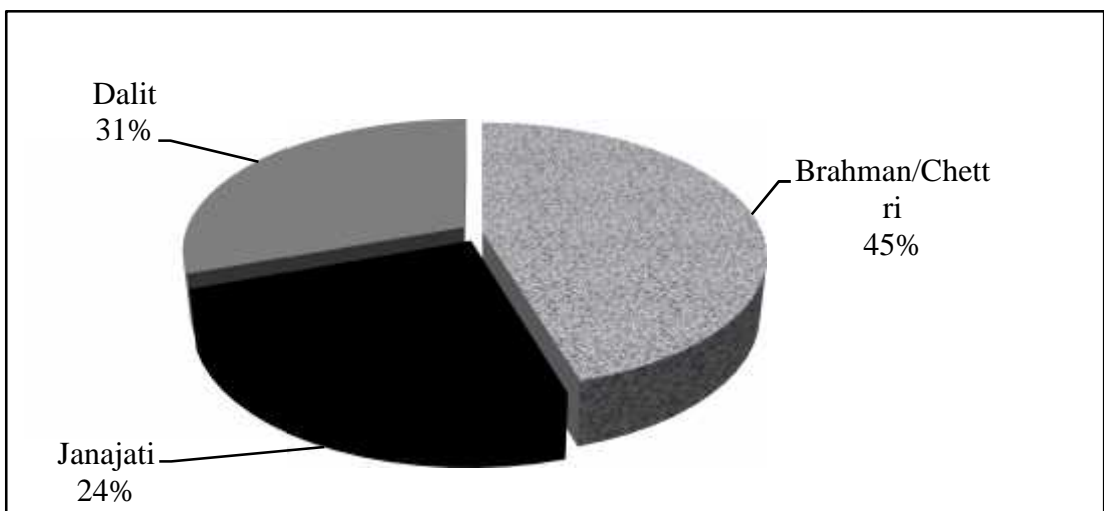


Figure 5: Caste/ethnicity Distribution

4.2.6 Distance from Rural Road

While conducting the survey for the distance of houses from rural road it was found that 45% of the families were at the distance of less than 50 meters from the rural road. The number of families at a distance of 1 km far from the rural road is only 14%. Where as a moderate percentage of families are at the distance of 50 meter to 1 km from the rural road. As the table no. 8 and figure no. 7 show, 14 families are found at the distance of 50-500 meters and 11 families are at the distance in between 500 meters to 1 km from the rural road.

Table 8: Distance from Rural Road

S N	Distance	No. of families	% of families
1	<50 mtrs	27	45
2	50-500 mtrs	14	23
3	500mtrs – 1 km	11	18
4	>1 km	8	14
	Total	60	100

4.2.7 Land Ownership among Sample Respondent

Among the selected families only two of them are landless or they don't own any land. As the given bar graph demonstrates, the percentage of families having the ownership of land is 97% and landless percentage is 3%.

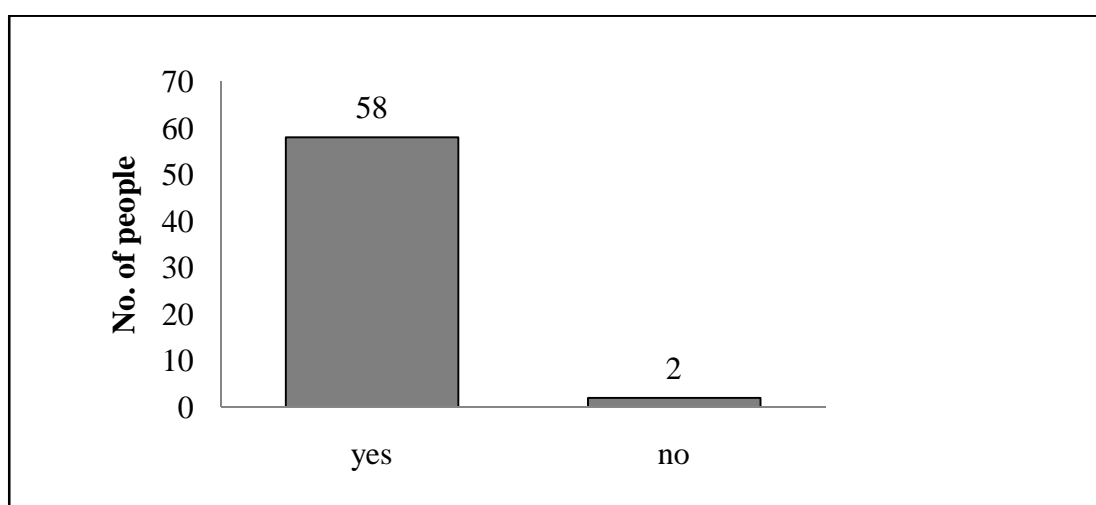


Figure 6: Land ownership

Among the land owning families, most of them have bari where cultivation level is poor and mostly food crops are cultivated at low scale. In terms of land ownership, diversified figures can be found as some of the families possess only 1 ropani, some 1-5 ropani, some 6-10 ropani, some 16-20 ropani and some families even possess more 20 ropani land. However, it can be summarized that an average of 11-15ropani of land is possessed by most of the families and most of the families have more bari and less khet.

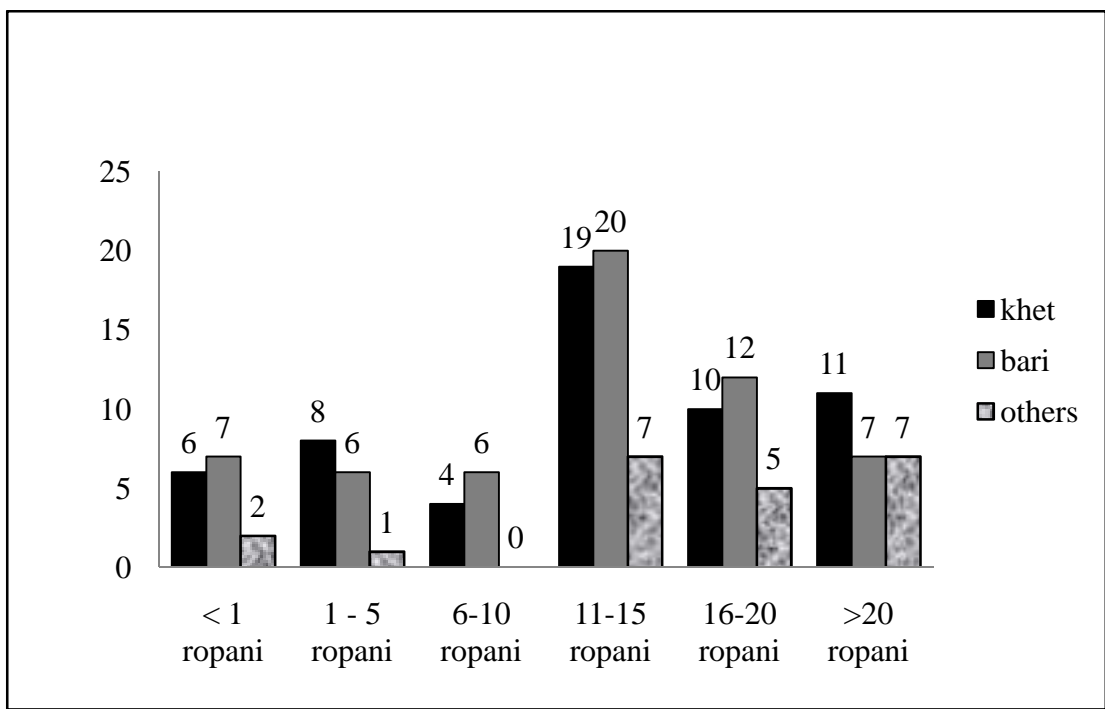


Figure 7: Land Ownership

4.2.8 Cultivation Ownership

Most of the families are involved in cultivation themselves. Culture of rent in terms of cultivation is also found. 25% of families practice rented in cultivation culture and 13% families practice rented out culture. Out of 60 families 37 families or 62% people are found involved in the cultivation of different food crops and cash crops themselves.

Table 9: Cultivation Ownership

S. No.	Cultivation ownership	No. of families	% of families
1	Self	37	62
2	Rented in	15	25
3	Rented out	8	13
4	TOTAL	60	100

4.3 Land Contribution for Rural Road

In the study area, respondents are found to be contributing land for the road construction. Among the sample families, 29 of them have contributed land for rural road construction. It means 48% respondents of this research area have directly contributed more or less land for rural road but the contribution ranges from 3 meters to 5 meters.

Table 10: Land Contribution

S.No.	Land contribution	No. of families	% of families
1	<3 mtrs	14	48
2	3-5 mtrs	11	38
3	>5 mtrs	4	14
4	Total	29	100

Among those who contributed land for the road construction, only 14% of them have contributed more than 5 meters of land. Most of them (48%) have contributed less than 3 meters of land, 14% families have contributed more than 5 meters and 38% have contributed in between 3-5 meters of land.

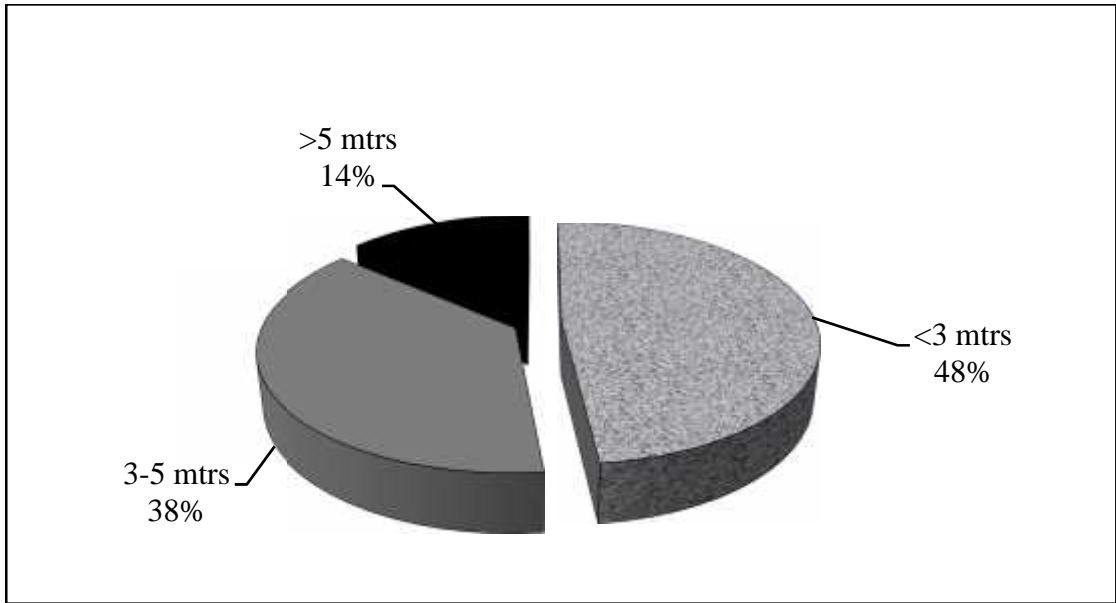


Figure 8: Amount of Land Contribution

The economic impact of rural road construction on the price of land is found to be increased. The price of Khet, Bari and Homeland and the land adjacent to newly constructed road is found to be consistently increasing. The ratio of increment in the price of land is found to be highest for the land near to the road (from NPR 600 thousand per ropani before road construction to 1 million per ropani after road construction).

Table 11: Price of Land

S. No.	Merge	Land price(Thousand/per ropani)	
		Before	After
1	Khet	300	400
2	Bari	400	500
3	Homeland	500	700
4	Near to road land	600	1000

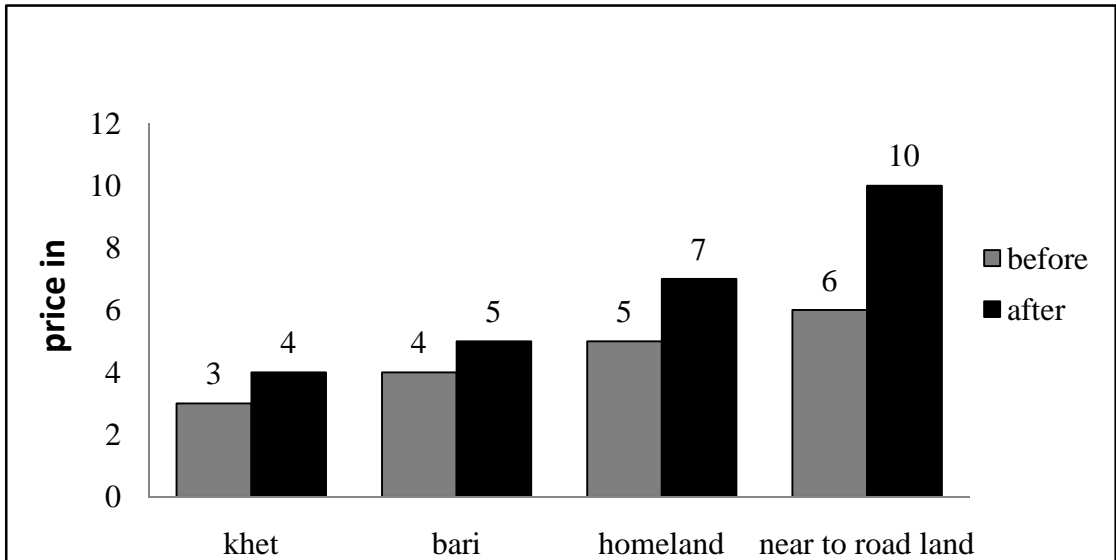


Figure 9: Price of Land Per Ropani

4.4 Construction of House near Road

The trend of constructing home near to the road is increasing. Among the total respondents, 57 of them said that the trend of building homes near to the road was increasing. As the pie chart clarifies, nearly 95% respondents agree on the fact that construction works have rapidly been increased in the comparison to the previous time due to the accesses of road for managing construction materials. Recently it is found from survey that, 20 new houses are being constructed near to the road.

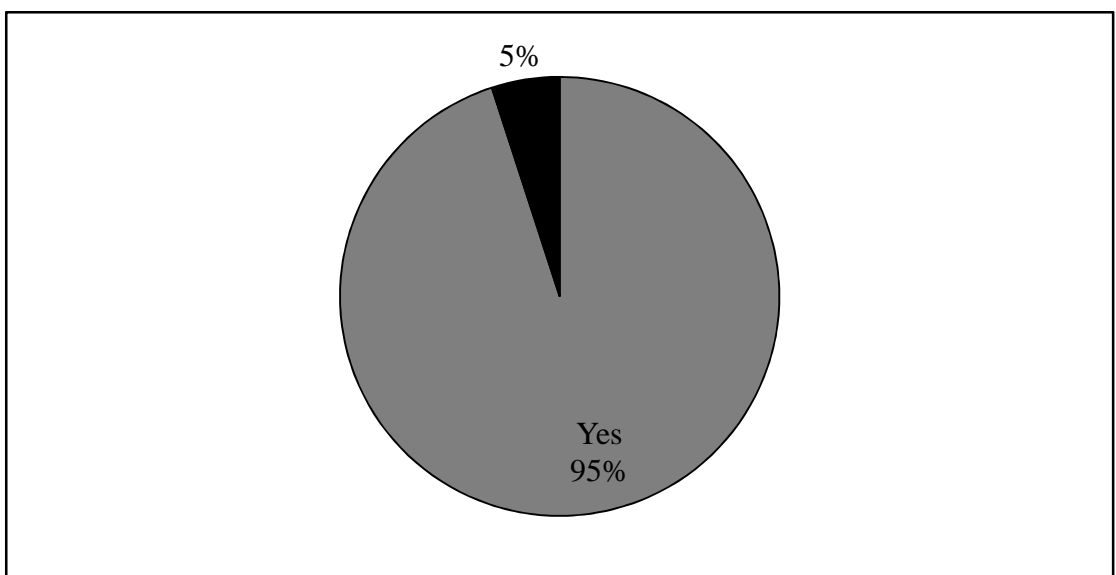


Figure 10: Construction of Home Near to the Road

The major reason behind construction of home near to the road is for transportation facilities. However, business opportunities, health facilities and educational facilities are also the reasons for which people construct home near to road. Out of total respondents 25% are found constructing house near road for business opportunities and 30%, 20% and 25% people are doing so for transportation, education and health facilities respectively. Even some people are found engaged on running poultry farming, rearing goats and cattle, community farming, commercial farming, grinding mills and soon after the access of rural road.

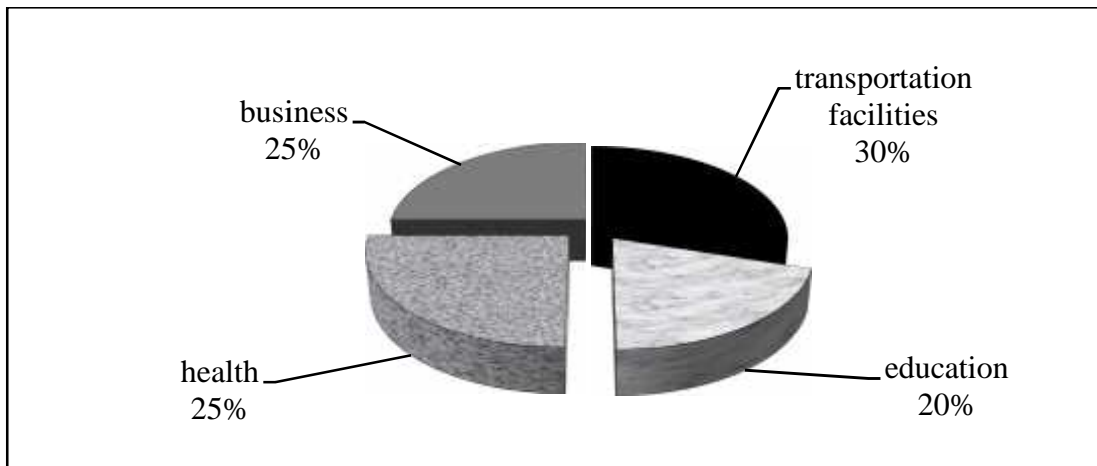


Figure 11: Reasons of Construction

4.5 Rural Road and Education

After the construction of rural road, access to educational institutions is increased. Among the total sample families, 56 respondents said that rural road transportation aids education. But four of them state there is not any significant change in the education facility after the construction of road. Kamal Chandra Pokhrel, Principal of Saraswati Lower Secondary School in Gajarkot-6, said, "Though rural road doesn't provide any shuttle service to come to the school with the provision of vehicles as in the cities, it is the awareness level and impact of development that induces the children to go to school as a modernization effect."

Moreover, the access to higher education is increased as students from the rural part have the transportation facilities to go to the cities and they could come home frequently for the other household purposes at least for once a week. After the

access to road, locally established + school (higher secondary level school) has also been benefited as number of student is increased and girls are also found motivated for going to school. The bar graph given in this page also admits this fact as 93% respondents say that rural road transportation aids education.

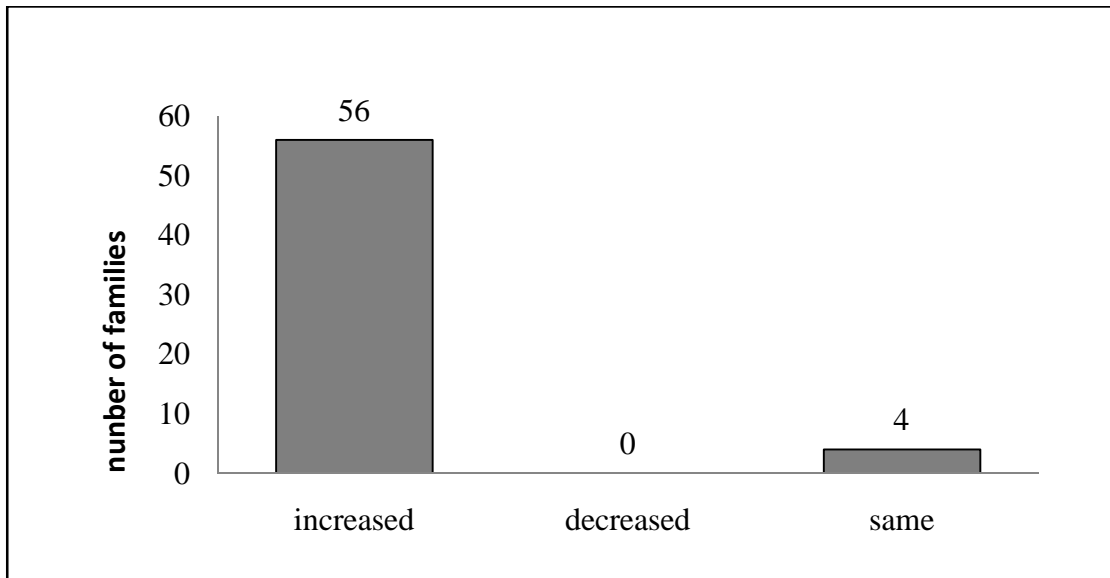


Figure 12: Rural Road Transportation Education

4.6 Opportunity Structures

Positive impact of rural road in terms of economy is the increased opportunity in transportation of agricultural products. Vegetables, seasonal cereals, maize wheat and even maize are commercialized at low scale which was only the factors of subsistence farming previously. Among the respondents, 58 of them said that after the road construction transportation of agricultural products is increased. Also, owning private business have been increased, 45 out of 60 respondents said that it was increased. However, the industrial activities are not significantly changed after the rural road construction. A few increments in the employment are found after the rural road construction as 18 respondents said. The employment in terms of labor force in rural road construction was supportive but these are much limited as after the project is completed, the job vanishes. The traditional way of business, industry, employment, agriculture etc are slightly replaced by the modern technology when construction of rural road. The village is shift to the modernization due to the construction of roads.

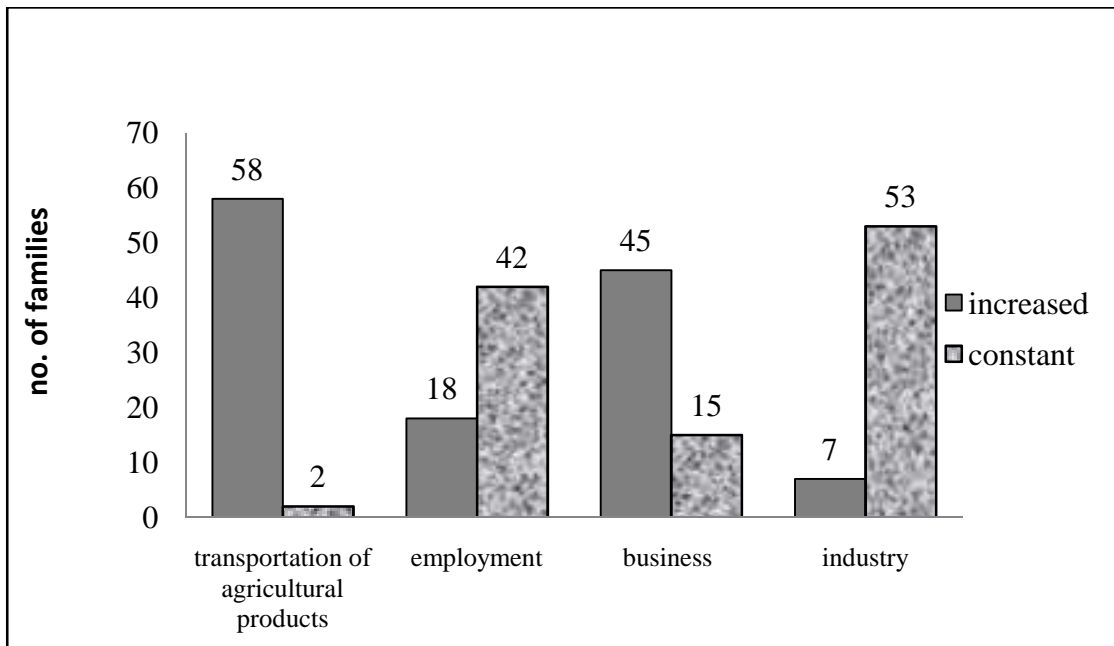


Figure 13: Opportunities by Rural Road

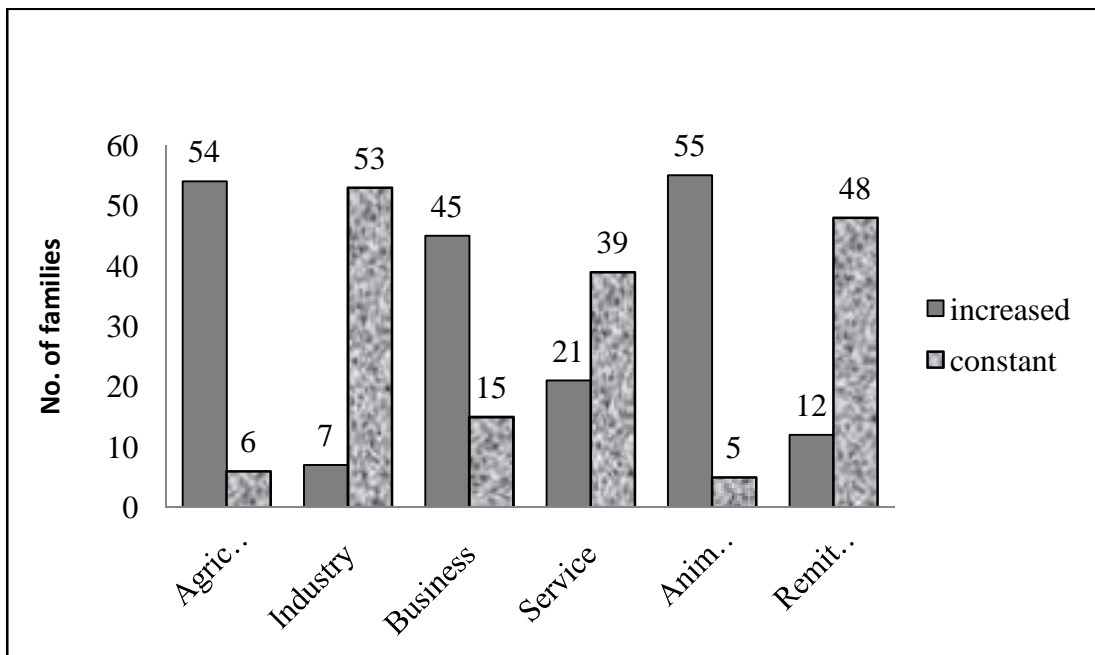


Figure 14: Description about Income

In the study area, major sources of income are agriculture, animal husbandry and remittance. Government service, involvement in small scale industry and business activities is also the sources of income.

After the rural road construction, income through agricultural product is highly increased. Among the respondents, 54 household head said that the income rate of their family is increased after the rural road construction. Also, 55 of them said that the income through animal husbandry is increased. Business activities have also become the major income source after the rural road construction. But, there is no significant change in the income through industry, service and remittance after the construction of rural road.

4.7 Change in Cropping Pattern

The cropping pattern in the study area is once in a year. After the road construction 32 respondents said that there has been advancement in the cropping pattern. Sahila B.K. of Gajarkot-5, said that he used to depend on the cropping only to others field, but after getting access to the nearby market, he himself got the mobility and access to buy seeds for cropping in his own field. Also use of tractors in place of plough has been increased. This shows that there is direct impact of rural road construction in cropping pattern. However, many people said there is no any advancement in cropping pattern after the construction of rural road. The below mentioned bar graph and table also approves that the cropping pattern has drastically been changed. 11 families have been able to use improved seeds on their fields, 18 families have been turned in to cash cropping with new, advanced and hybrid seeds shifting from traditional farming and some other families have introduced new variety such as cultivation of mushroom, allovera etc.

Table 12: Change in Cropping Pattern

S.No	Change in cropping pattern	No. of families	% of families
1	No change	28	
2	Local to improved variety	11	35
3	Cereal crop to cash crop(vegetables)	18	56
4	Introduced new variety	3	9
5	TOTAL	60	100

The total family of this study is 60. Out of these 60 families 28 families are no change in cropping pattern, 11 families are local to improved variety, 18 families are cereal

crop to cash crop and only, 3 families are introduced new variety of cropping pattern. So, road constructions do not affect the cropping pattern of this village properly. The percentage of cropping pattern are shown by the below pie chart.

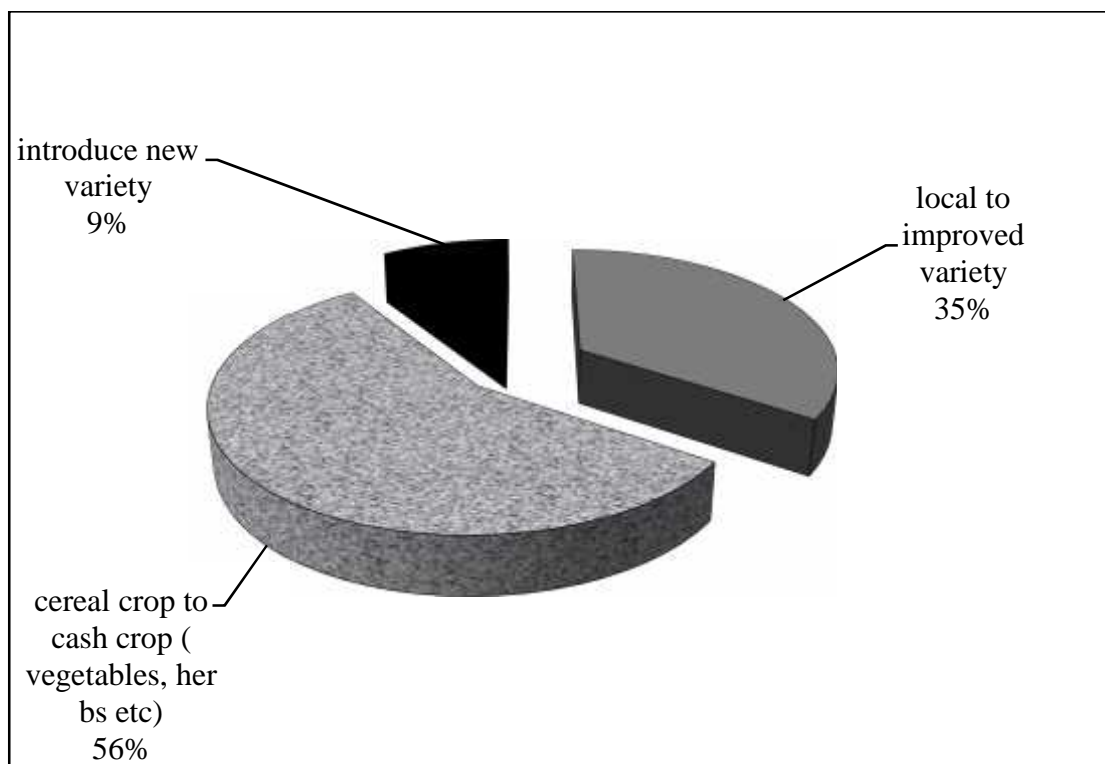


Figure 15: Advancement in Cropping Pattern

4.8 Impact on Agriculture Works after Rural Road Construction

Before the construction of rural road, tools and equipment used for agricultural works were of traditional type. Due to the feasibility of transportation facility people have started using modern tools and equipment in agricultural works. a large number of respondents (47) said that agricultural work has been easier after the construction of rural road. Local people have been able to bring fertilizers, chemicals and seasonable seeds of different crops coordinating with District Agricultural Development Office and other agriculture centres and sub-centres. Most importantly farmers are benefited from the service of livestock as well as agricultural technicians as per their necessity after the rural road connectivity. On the other side, due to the rural linkage with neighboring villages, agricultural workers for Parma and Mela can have the facility of transportation and it has also widened the market to sell the production of the farmers in nearby village as well as to export in urban areas.

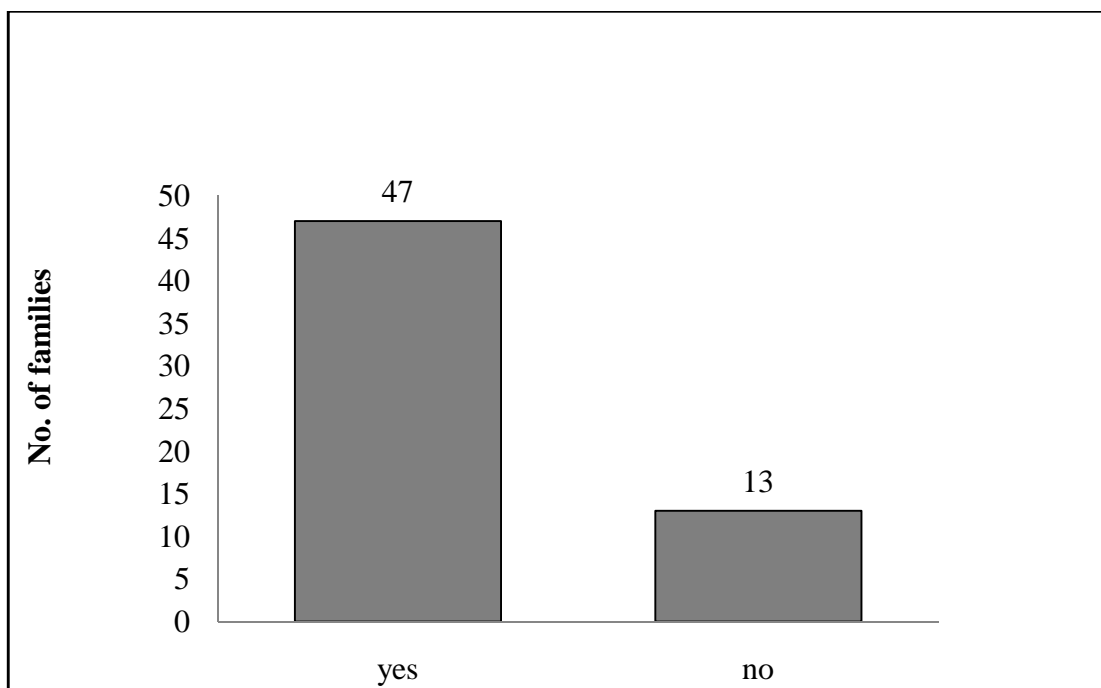


Figure 16: Agriculture Works made Easy

4.9 Pattern of Agricultural Production

While conducting general survey and estimating the data on the agriculture production pattern comparing the present with few years ago, it was found that the agriculture production was increased. However some people also explained that due to construction of road and house buildings across the road, the cultivating land is decreased thus, declining the agricultural products. 6% of the people said the agricultural pattern is constant.

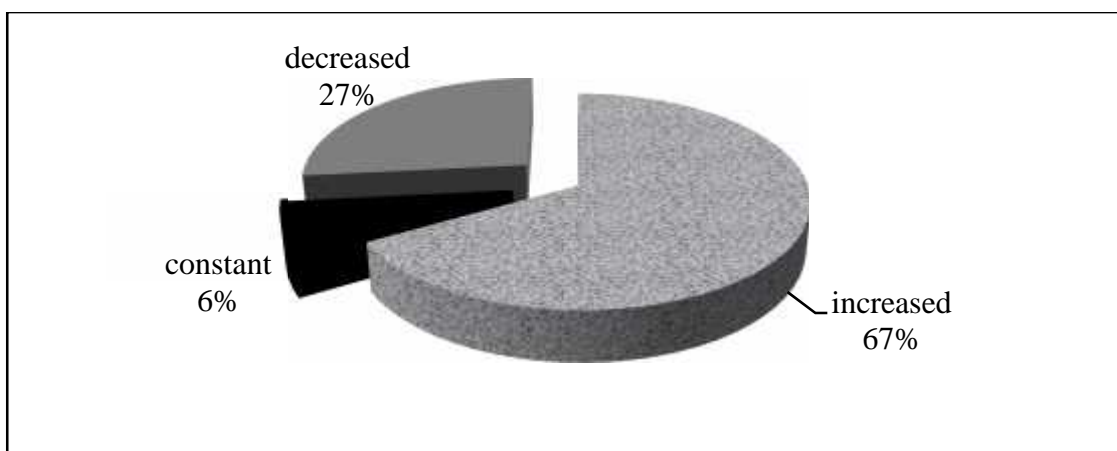


Figure 17: Agriculture Production

To increase the supply of agriculture production new technology is being used. This includes genetic modification, chemical fertilizers and synthetic pesticides in agriculture. It is changing cropping pattern as per the climatic adjustments. Modern agriculture means traditional farming with the facilities of modern agricultural equipments and technology. In the past the farmers used to use bull to plough or dig the soil. But now with the facilities of modern technology farmers are using tractor for this purpose. Different types of hybrid seeds, fertilizers and breeds of birds, animals and fishes are now available for maximizing the production. We don't like traditional agriculture. Modern agriculture has changed the total agricultural process. So, modern agricultural revolution is a must. To be success in agriculture and farming business, we need the proper and correct information based on modern technology. So, produces various vegetables, fruits, crops and herbs among other.

4.10 Sale of Agriculture Product

As 67% people of research area have agreed that agricultural production is increased after the access of road construction, most of respondents have said that the sale of agricultural product has become the positive consequence of rural road construction.

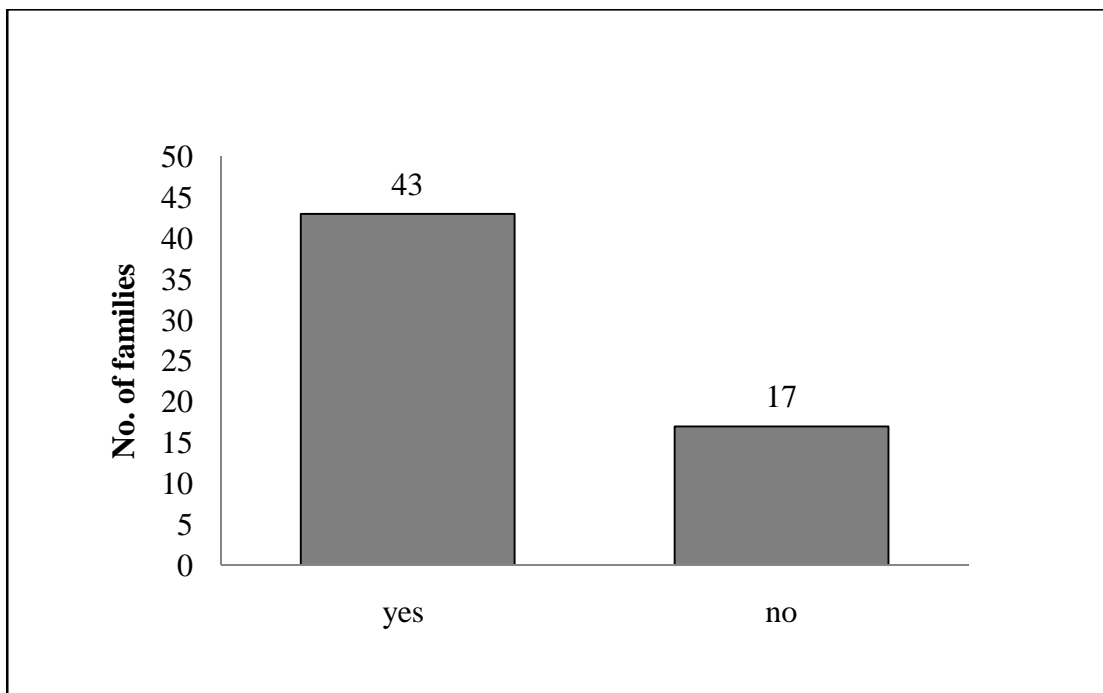


Figure 18: Sale of Agriculture Product

4.11 Area of Sale

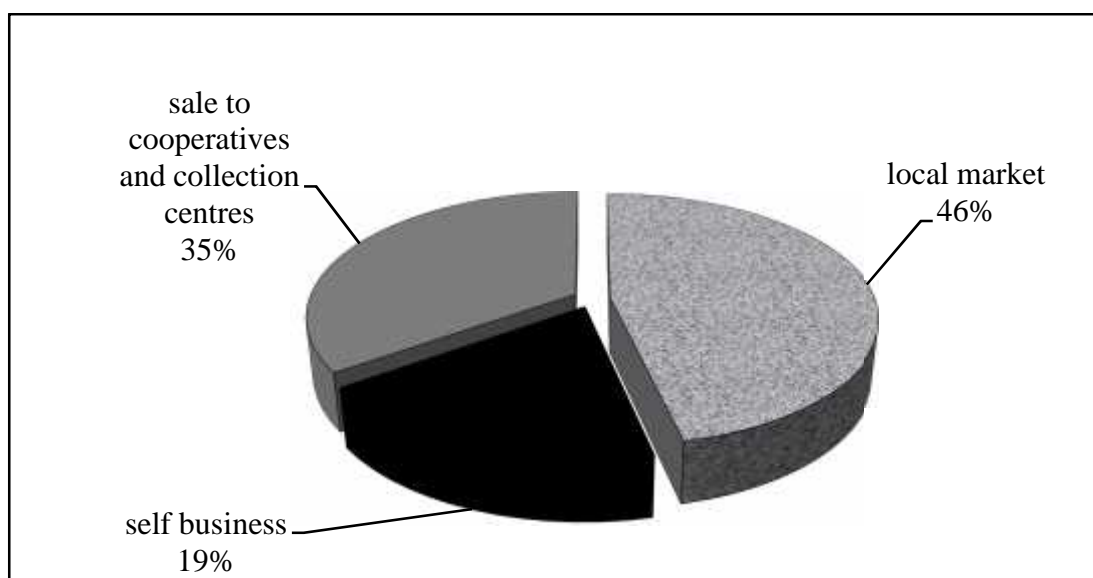


Figure 19: Area of Sale

Local market development is found to be increased after the rural road construction in the study area. Sale of agricultural products is increased as 43 respondents agree. Even the self-business is found to be occurred. Among the respondents, 35% said that selling of agricultural products in cooperatives and collection centers is found. Local market has also been enhanced.

4.12 Environmental Impact of Rural Road

Rural road construction is a developmental process which needs environmental and social impact assessment. Though various techniques are adopted to reduce the negative environmental impact on the local community, some of the impacts are common and cannot be fully controlled.

- a. **Landslide and deforestation:** These are the common problems often observed due to slaughtering of trees for the opening of track in the very beginning. The survey shows that around 47 out of 60 sample people said that landslide and deforestation have been greatly increased due to rural road construction that have ultimately lead to soil erosion.

- b. **Soil erosion**: In the long run soil erosion of the area is seen prominently due to landslide and deforestation. The top fertile soil is washed away and thus the fertility of the soil is decreased that has direct negative effect on the agricultural production. The data shows that 52 out of 60 agree with the fact that rural road construction leads to soil erosion.
- c. **Rainfall**: The impacts of rural road construction are not seen only in the environmental factors but it also affects the climate mostly in the rainfall patters. People of Gajarkot VDC said that few years ago the rainfall occurred in time with right amount, but as the development begins, it has affected everything and now there is irregular rainfall. Mostly rainfall occurs in off season like December January in spite of June/July. The amount of rain has also decreased.
- d. **Source of water**: The other major impact is the scarcity of water. As the rainfall is decreased, the level of ground water is lowered and now the local sources like well is also deteriorating. 39 out of 60 has reported that the source if water is reducing due to rural road construction.
- e. **Medicinal herbs**: Gajarkot was very rich in medicinal herbs few decades ago. But as the rural road construction begun with environmental impacts like landslide, deforestation, irregular rainfall, and loss of water source, the valuable medicinal herbs are also destroyed. They are not found in thaw jungle anymore. 35 out of 60 people blamed rural road for the demolishing of medicinal herbs.
- f. **Air pollution due to dust**: Moreover, air pollution due to the dust is the significant impact on the study area as 56 out of 60 respondents agree that air pollution is increased. Dilli Ram Bhandari, a local teacher says, "It is easy that we have the access to bicycles and motorcycles for travelling to the neighboring villages, but the dust particles serve as the major contributor for air pollution. Even the vegetable production and livelihood near to the road is affected by the dust in the winter and spring season. People who use the newly constructed road for walking purpose should often encounter with the running vehicles with the dust left behind."

The figure 20 explores the bitter experiences of people as the negative impacts of road construction for the environment. As most of the people agree, deforestation, soil erosion, landslide, air pollution are the increasing problems caused more or less by road construction and decreasing trends of rainfall, source of water and herbs are

the worrisome matters of people which are adversely affecting the day to life of people and inviting environmental imbalance.

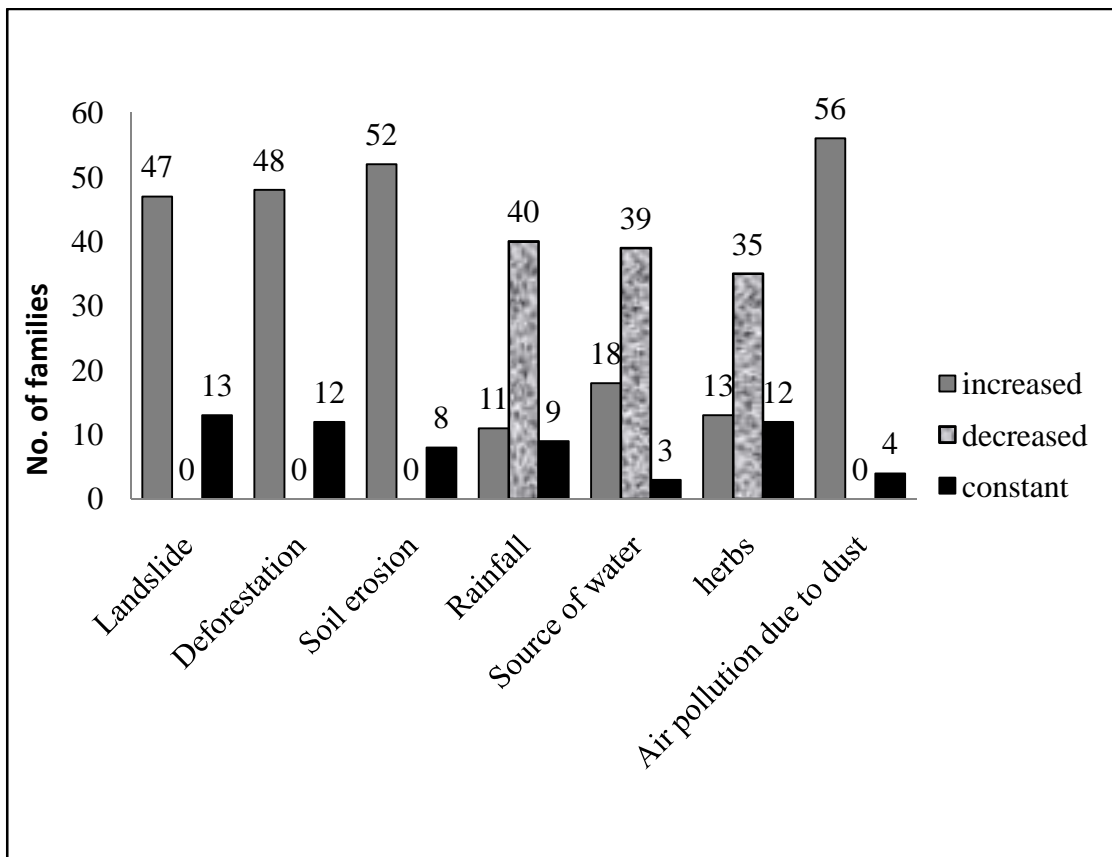


Figure 20: Environmental Impact of Rural Road

4.13 Social Impact of Rural Road Construction

Development invites many changes in the social setting of any locality. Road construction provides the highest chances of mobility and migration of people. The study area is found to be with the closed societal characteristics.

The social institutions with the advent of other modern characteristics are found to be emerged such as local cooperatives based on agricultural products based on marketing. Involvement of local people in the social functions is increased. However, there are certain areas where social impact is negatively assessed. Among the respondents 57% said that alcoholism, smoking and gambling as the social crimes are increased after the rural road construction.

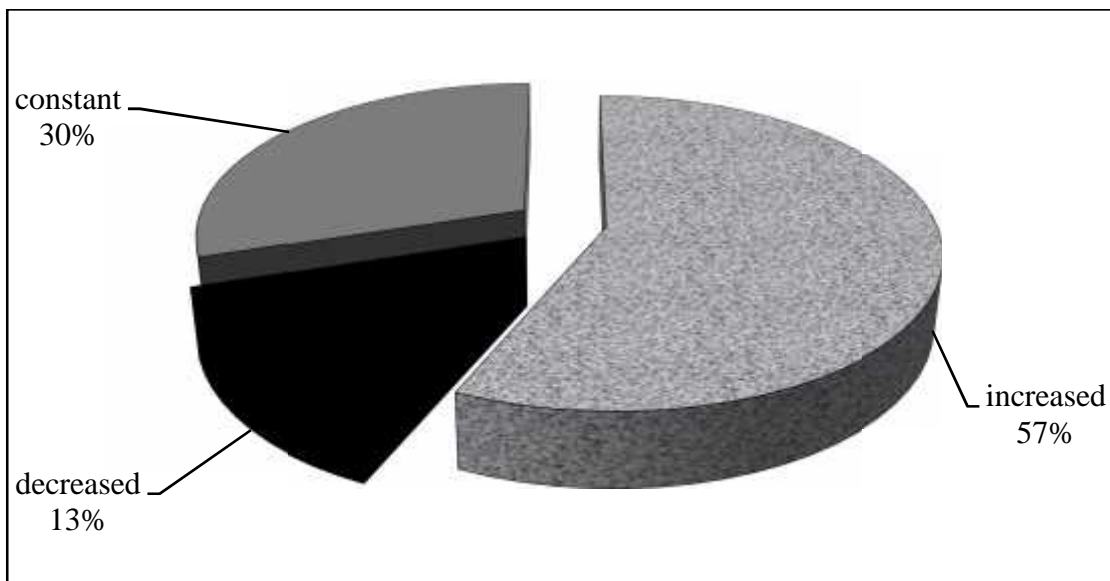


Figure 21: Social Crimes

Rishiram Bhattraï, 69, of Gajarkot 5, says “there was not a single hotel before the road was constructed. But now, there are three in this village and other two in the next village where only the staffs of buses and jeeps come and stay. The local youths join them for drinking and gambling. Every evening there comes the loud music with shouting at each other among the staffs of the bus.” Imitation of the modern cultures by the youths in the villages is also one of the social impacts.

Many children from the backward groups and minorities are found to abandon the school and started joining the jeeps as helpers. They don't stay at home even in the night time. They are habituated to travel working as the helpers though the drivers reject many times. Ultimately, after few years they will learn driving and their escaping from schools turns out to be the professional drivers as the output of dropouts. The vehicle owners would go with them as they don't have to pay them higher compared to other professionals. They are also accepted and praised by the families as they though nominal, are the good sources for income. But after few years, they will be migrating to the foreign countries as the laborer.

CHAPTER – FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Summary

The study on impact of rural road through the perspective of socio-economic, environmental and agricultural change was carried out in Gajarkot VDC of Tanahun district, in western Nepal. The main objective of the study was to assess the socio-economic, environmental and agricultural impact of rural road construction in the study area. For this study 60 households were sampled based on random sampling method from the four wards.

Among the 60 households, 58 owned the land and more than half of the owned 'Bari'. Percentage of cultivation ownership found to be rested upon the self is 62%.

Most of the households who contributed land for rural road construction have contributed less than three meters (14 out of 29). The price of land near to the road is found to be increased after the construction of road in the study area.

People have started building the home near the roadside because of transportation facilities and business opportunities. Among the respondents (60) in total, 56 of them agree that rural road transportation has aided education.

Although construction of rural road has developed opportunity structures in the field of transportation of agricultural products and business, it is less significant in terms of employment creation and industrial activities.

One of the major advancement found in cropping pattern is in the shift of cereal cropping to vegetables and herbs. Also the agricultural works have become easier. Selling of agricultural product in the local market is highest as 46% of 43 respondents (those who said sale of agricultural product was feasible after rural road construction among the total respondents 60) agree.

Increase in landslide and air pollution and decrease in source of water are found to be the major environmental impact of rural road construction. Soil erosion and deforestation are also the major impacts as the respondents revealed.

In regards to the social impact of rural road construction, 57% of the respondents have the view that alcoholism, smoking and gambling are increased in the study area. Also, imitation of modern culture by the local youths in the village is found to be increased.

5.2 Conclusion

Rural road plays an important role in the development process of any nation. The geographical situation of Nepal attracts the importance of rural road for various purposes such as local transportation, construction of agricultural track and even for the tourism promotion. Nepal still lies below the poverty line in the development index. Rural road construction aids in the poverty reduction and establishment of other standard developmental parameters as the secondary parts. Rural road construction not only has provided avenue for transportation and easy livelihood but also enhances the opportunities for education and health facilities. Rural road construction has promoted the establishment of various groups such as cooperatives for collection and marketing of agricultural products in the local areas.

Involvement of the people in entrepreneurship through private business and small scale industrial activities has been increased. But, negative impacts are also observed in the study area. Increased perception of air pollution by the local people is the major drawback. On the other hand, social norms and values are challenged by the infiltration of various criminal traits such as gambling and alcoholism. To change the agriculture practices, human civilization, education status, political awareness, caste system etc. in new technology is being used. This includes genetic modification, chemical fertilizers and synthetic pesticides in agriculture. It is changing cropping pattern as per the climatic adjustments. In the past the farmers used to use bull to plough or dig the soil. But now with the facilities of modern technology farmers are using tractor for this purpose. Modern technology has changed the total livelihood process. So, modernization helps to revolution of society. To be success in many areas we need the proper and correct information based on modern technology. Thus,

rural road construction is not merely a technical part of rural infrastructure but also has social implication. Thus overall development of the study area depends on both social and economic aspects of development.

5.3 Recommendations

Based on the study on impact of rural road construction, the following recommendations are made:

-) A functional users group should be created at the local level including all the representatives from various villages.
-) A technical environmental monitoring should be established at the VDC level that monitors and reports the environmental situation to the higher level.
-) Means of traditional social control such as social norms and values, indigenous mechanisms of disputes resolution should be strengthened.
-) Regular budget allocation for the construction of road should be provisioned to reduce the health hazards.
-) Rural collection centre for vegetable and other agricultural product marketing should be prioritized.
-) Public awareness for the campaigns against social crimes should be launched.
-) Scheme and plans for proper rural planning should be implemented so that the urbanization process in the future will be scientific.
-) Local youth clubs and Mothers groups should be empowered for social harmony.
-) Trainings for the staffs of buses and jeeps those run along the rural road should be provided so that social crimes will be mitigated.
-) A proper mechanism of compensation should be provisioned for those who provided the private land.
-) There are lots of areas to be studied by the scholars regarding the positive and negative impacts of rural road on livelihood as well as environment.
-) Research should be done to construct rural road more scientifically using engineering techniques so that its environmental negative impacts can be minimized.

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ANNEX I

Questionnaire

Impact of Rural Road

A Field Study of Gajarkot VDC, Tanahun District, Nepal

Date:

Ward:

Name of village:

Distance to market:

Distance to headquarter:

- 1) Family composition on the basis of age, sex, education and occupation.

S.N	Name	Age	Relation with HH Head	Education	Occupation	Marital Status	Religion	Cast e
1								
2								
3								
4								
5								
6								
7								
8								
9								

- 2) How long is the distance to the rural road from your house?

.....

- 3) Do you have your own land?

a) Yes b) No

- 4) If yes, how much?

Types of land	Land in ropani	Cultivation ownership		
		Self	Rented in	Rented out
Khet				
Bari				
other				

Did you give your land for the construction of road?

- a) Yes b) No

6) If yes, how much land you gave?

.....

7) How much money you get paid instead of your land?

.....

8) Are you satisfied with the compensation given by government?

- a) Yes b) No

9) What is the price of land?

Total land holding	Land price	
	Before	After
Khet		
Bari		
Homeland		
Near to road land		

10) Are you preferred to construct your house nearby the road side? Why?

) Yes

) No

- a) Due to transportation facilities
b) Due to help for the children in getting education
c) Easy to treatment during sick period
d) To do business

11) Transportation facility to get education

	It was more /less	It has increased/decreased
Before road		
After road		

- 12) What type of change has been come in marketing dynamic after road construction?

description	Increased	Decreased	Constant
Transportation of agri. production			
employment			
Business			
Industry			

- 13) Description about income

sources	Before road	After road	Remarks
	It was more /less	It has increase/decrease	
agriculture			
Industry			
Business Activities			
Service			
Animal husbandry			
Remittance			
Other			

- 14) Have you changed the cropping pattern after the road construction?

- a) Yes b) No
1. From local variety to improved one (.....)
 2. Cereal crop to cash crop (.....)
 3. Cereal crop to vegetable farming (.....)
 4. Introduced new variety (.....)

- 15) Has it become easier to do farming after the road construction?

- a) Yes b) No

- 16) Do you sell agriculture products?

- a) Yes b) No

- 17) Where do you sell your products?

- a) Local market b) self business in the city c) others

18) How the road does have supported to this community for agricultural work?

.....

19) Crop calendar

Month	Cropping			
Baisakha				
jestha				
ashad				
sharwan				
bhadra				
ashoja				
kartik				
mansir				
poush				
Magh				
falgun				
Chatea				

20) Have you adopted intercropping in your farm?

a) Yes b) No

21) If, yes mention which crop have you adopted as a intercropping?

a) Maize and millet b) Wheat and oil seeds c) Vegetables and chilli

22) Is there any irrigation facility?

a) Yes b) No

23) What kind of tools people use for farming?

a) Modern b) Traditional c) both of them

24) Use of agricultural means:

means	Before road	After road	remarks
	It was more/less/as it is	It has increase/decrease/as it is	
Hybrid seeds			
Chemical fertilizer			
pesticide			

25) How is the impact of rural road on environment?

	Before road	After road
	It was more/less/as it is	It is more/ less /as it is
Land slide		
spring		
Dusty environment		
deforestation		
Soil erosion		
Source of water		
Herbs		

26) Change in status of abuse like drinking, smoking, gambling etc.

	It was more /less	It has increase/decrease	As it is
Before road			
After road			

27) Could you tell me what types of positive impacts this road has brought after the construction?

.....

28) What are the negative impacts after road construction which passing through your community?

.....
.....

29) As a whole, what are the benefit people are gaining after road construction?

.....
.....

Focus group discussion

- 1) What type of change this road has made in the economic status of local people?
- 2) How is the change in the status of women after road construction?
- 3) What are the problems that arose in your society after road construction?
- 4) How the road does have supported to this community for agriculture work?
- 5) Is road a factor to impact on socio-economic sector?
- 6) How does road support to this community to participate in various sectors/ functions?
- 7) As a whole, what changes you are feeling in your community due to this constructed road?

Observation

- 1) What type of change has been made in the house density in the road corridor?
- 2) Impact on rural development, particularly on environment, participation, social, economical and agriculture sectors.
- 3) Observe on the level of interaction and interrelationship among the local people.

ANNEX II

Checklist for KII

- 1) What is the importance of Rural Road Construction in this community?
- 2) What are the major environmental issues in the community?
- 3) What is the major business activities carried out in your locality?
- 4) What type of change this road has made in the economic status of local people?
- 5) How is the change in the status of women after road construction?
- 6) What are the problems that arose in your society after road construction?
- 7) How the road does have supported to this community for agriculture work?
- 8) Is road a factor to impact on socio-economic sector?
- 9) How does road support to this community to participate in various sectors/ functions?
- 10) What are the major expectations from this constructed road?