

**SOCIO - ECONOMIC IMPACT OF PRESIDENT CHURE-
TERAI MADESH CONSERVATION PROGRAMME OF
NEPAL (A STUDY IN RUPANDEHI DISTRICT)**

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ABSTRACT

Chure is socio-economically very significant and environmentally vulnerable, fragile and sensitive area of Nepal. It covers 12.78 percent of the total landscape of the country. Recognizing this, the government has formulated a high level of board “President Chure-Terai Madesh Conservation Board” to oversee the conservation activities in this region. Based on this, the study attempts to examine the socio-economic impact and identify the problems and prospects of the programme. Using qualitative and quantitative analysis methods, the study is based on both secondary and primary data. The description of the primary data were collected during the 100 HHs survey in the Devadaha Municipality of Rupandehi District.

The study has pointed out that the programme has basically positive impact towards socio-economic aspects. But some extent, the programme has also found negative aspects. During the period the productive land has decreased from 57.39 percent to 50.91 percent, due to enlargement of settlement area. The availability of alternative irrigation sources is increase in sufficient level form 35 percent to 50 percent, through the recharge pond and dam programme after initiated the programme. Therefore the agricultural production has increased consequently, food sufficiency increased from 42 HHs to 59 HHs above 6 months. Similarly, the sufficiency of the water availability has also increased from 29 percent to 68 percent, where tap is used by 80 HHs. Which is due to the initiative taken by local people, local government and in some level by the programme. Due to the stoppage in the grazing area from the programme, some short of livestock keeping is decreased. Whereas fodder grasses (60.49 percent to 69.62 percent) and timber (55 percent to 66 percent) availability has increased. It is, due to the scientific management by community forest and the prgramme has made those products sufficient. The river products availability has insufficient which has decreased from 59 percent to 39 percent. The reason behind this it is greater implementation of regulation by PCTMCP. It can be concluded that after the implementation of the programme, there is slightly reduction in flood, landslide, illegal trafficking of forest and river products and forest fire. Therefore, the environment programme has achievcd the greater progress.

However, the programme has many problems, challenges and some prospects as well. So, the study concludes that as the programme being of long term nature, it takes more time to see the impact on socio-economic and environmental protection and conservation practices. The result has not been seen is greater mass at present. It could be hoped to obtain greater benefit in long run, if there is multistakeholder, multidisciplinary as well as multidimensional efforts took place in time.

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Abbreviation and Acronyms

CARE	: Cooperative for Assistance and Relief Everywhere
CBS	: Census Bureau Statistics
CF	: Community Forest
CSRC	: Community Self Reliance Centre
DFDOR	: District Forest Office Rupandehi
DFO	: District Forest Office
DOF	: Department of Forest
DPR	: Department of Plant Resources
DSCOR	: District Soil Conservation Office Rupandehi
DSCWM	: Department of Soil Conservation and Water Management
FUGs	: Forest User Groups
FY	: Fiscal Year
GON	: Government of Nepal
Gov	: Government
HHs	: Household Survey
IUCN	: International Union for Conservation of Nature
MCM	: Million Cubic Meter
MOFSC	: Ministry of Soil and Forest Conservation
MP	: Master Plan
NFTA	: Nepal Forest Technical Association
NPC	: Nepal Planning Commission
NPHC	: National Population and Housing Census
NPWLR	: National Park and Wildlife Reserve
PAR	: Participatory Action Research
PCTMCB	: President Chure-Terai Madesh Conservation Board
PCTMCP	: President Chure-Terai Madesh Conservation Programme
PES	: Payment of Environment Services
PMU	: Project Management Unit
RCCP	: Ratrapati Chure Conservation Programme
Reg	: Regional
SHHs	: Sample Households
V.D.C	: Village Development Committee
WWF	: World Wildlife Fund

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CHAPTER - I

INTRODUCTION

1.1 Background of the Study

Chure is a young mountain range situated between the Mahabharat Range in the north and the Tarai plains in the south. The range is mostly a long single file of a low hill that runs continuously from Indus River in Pakistan in the west throughout the length of Nepal until it reaches Bramhaputra River in India in the east. Chure Range (Appendix-I) is also known as the Siwalik Hills. This range was formed by sediments deposited during the origination of the Himalayas 40 million years ago. The range covers about 12.78 percent of Nepal's total land area (18,860 sq km) of the total landscape of the country and is regarded as home to about 60 percent of the total population of the country and touches 37 districts. It has varied elevations ranging from 200 meters above sea level to nearly 2,000 meters (Pandey, 2016).

Nepal itself being a small country, is considered rich in bio-diversity due to being variety in topography. Among different geographical reason, chure region cover 12.78 percent area which has got variety of bio-diversity, and also social and ecological variations. It range from eastern Mechi to western Mahakali which is considered as the origin of bio-diversity in Asia. It is the bridge between hills and low plain area and considered as water recharger for the terai region. The forest area of Chure covers significant part of Nepal for collection the sources of revenue (NFTA, 2013).

Socio-economically Chure is of great significance to Nepal in several ways. Chure provides essential ecosystem services to the low land region and host an abundance of valuable natural resources. All of Nepal's larger rivers flow through the region which makes it of great importance to the ground water recharge in southern Terai. The young mountains are filled with easily extracted and valuable sand, gravel and boulder products and currently crusher industries mine these natural resources at a rapid rate. The hardwood timbers are another valuable resource from the Chure Mountains, which provide economic revenues to both timber-traders and the government.

It has significant social, ecological environmental and palentological values as this region provides important source of biodiversity, fossils and a basis for knowledge on evolution of Asia fauna. Bhabar (footslope) is a unique ecological zone which recharges water for flat lands (Terai). Despite its significant importance, the fragile landscape of Churia region is degrading at an alarming rate due to increased human pressure (livestock grazing, timber smuggling, illegal tree felling, etc). Consequently, these have accelerated the loss of soil and biodiversity, floods, riverbank cutting and decrease in farm land productivity and have left poverty and land degradation as a landmark (Giri .et al. 2012).

It is distinctive in terms of geological, biological, hydrological cycle and ecological point of views, and following the eradication of cholera after the decade of 1950s and after the construction of the East-west Highway, the extension of human settlement started in the entire Chure-Tarai Madhesh Landscape leading it to be the habitat of more than half of the nation's population (14,748,672 as of 2011 population census); and because of their activities, the natural resources of this entire region were extracted beyond their renewable capacity. Being sensitive towards the adverse impacts upon the Chure-Tarai Madhesh landscape due to the deteriorating status of the Chure region, the Government of Nepal (GoN), had initiated the implementation of the President Chure Conservation Program in the fiscal year 2009/10 (2066/67 B.S), and this program has been considered as the "Program with National Glory" since the F.Y. 2013/14. As the expected results could not be achieved even then, the GoN formed the President Chure-Tarai Madhesh Conservation Development Board on 17th June, 2014 (PCTMCB, 2017 a).

The socio-economic status includes the settlements and population, their occupation, the use of energy, the existing and the developing-stage important physical structures and public facilities, and the existing organizations and structures. Government has invested in different programs in 37 districts of Chure region through President Chure-Terai Conservation Program by making 20 years master plan. The study is focus towards the programs and the amount invested in them in each districts by the central government. The study is also focus how the implemented programs are giving effective results towards the betterment of the society and peoples' attitude towards those programs.

1.2 Statement of the Problem

The Chure region is very important for biodiversity, water resources, natural resources, animal husbandry and agriculture activities. By proper utilization of the resources of the Chure region, the economic benefits could be taken at the central and local level. But at the present context, the Chure region is being deteriorated in concurrence with the human development, Illegal extraction of river products, hunting of the wild animals, smuggling of the forest products have deteriorated the environment and has the deep rooted impact on socio-economic system including agricultural and animal husbandry system. The government of Nepal has addressed towards the conservation of the Chure region by established the PCTMCP since 2014 (2071, BS.) The government has also made a committee towards the conservation of the environment in this region. The budget has been allocated different towards the affected areas for conducting different programs every fiscal year.

The government has gradually increased the amount of the budget every year for conducting different programmes. The government had expected the greater level of economic and social upliftment of the people of this region. But the different surveys and studies have shown that the expected result have not been meet and also the local level agricultural production, animal rearing progress could not been seen. But the environment conservation programme has achieved the greater progress.

The programme is the optimistic project of the government. But for the success of this programme there are many challenges. Among other challenges, lack of the study of the geography, unclear rules and regulations are major ones. The lack of proper coordination among people and the government is also the problem for formulating the programme. Lack of quality works, no completion of the programme in time are the major problems for this too. Though there are many problems and challenges in the implementation of the programme. There will be greater amount of socio-economic benefits associated towards the programme, if it became successful. The economic condition of the local people can be enhanced if the proper management of the water resources, scientific utilization of forest, elimination of the soil erosion, promotion of animal husbandry and other agricultural

products can be done properly. However the study is trying to answer the given research questions:

- a) What is the trend and composition of financial statement of PCTMCP in the study area?
- b) What is the socio-economic impact of the programme in the study area?
- c) What are the major problems, challenges and prospects of the programme in the study area?

1.3 Objectives of the Study

The general objective of the study is to analyse the socio-economic impact of the programme in the study area at local level. However the specific objectives of the study are:-

- a) To analysis the trend and composition financial statement of PCTMCP in the study area.
- b) To examine the socio-economic impact of the programme in the study area.
- c) To explain the major problems, challenges and prospects of the programme in the study area.

1.4 Significance of the Study

Chure-Terai region of Nepal plays a significance role in several ways in socio-economic, cultural and environment aspects of the nation. The region provides essential ecosystem services to the low land regions and hosts an abundance of valuable natural resources. All of Nepal's larger river flow through the region which makes it of great importance to the ground water recharge in southern Terai. In Terai, the plain and fertile lands comprise the grain basket of Nepalese agriculture. The young mountains are filled with easily erected and valuable sand, gravel and boulder products and currently crusher industries mine these natural resources at a rapid rate. The hardwood timbers, are another valuable resources from the Chure Mountains, which provide economic revenues to timber-traders and government.

The study is ascertain the areas where this programme is implemented and how the budget is being made. It will give the information whether there is good output or not as per the budget made and what are the social and economic effects that are being seen in the society.

The study will also inform about the problematic areas of the implementation and are the prospects of this programme of the study area. Thus, the study will be beneficial to the government, national planner, policy makers, researcher, teachers, students, and local people those who are interested to know many things about the PCTMCP.

1.5 Limitations of the Study

This study has the following limitations:

- a) The study is covering the given four year's trend and composition of financial statement of the programme.
- b) The accuracy of the result is based on the data and information provided by the respondents of the study area.
- c) The study is based only on the Devadaha Municipality of Rupandehi district, the result of the study can't be generalized in other Chure region areas of Nepal.

1.6 Organization of the Study

This study is going to be organized into five chapters along with various sections and sub-sections. The first chapter of the study is the introduction that deals with 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 of the study is review of literature which includes conceptual framework, international context, Nepalese context and research gap. Third chapter is the research methodology. It includes introduction and selection of the study area, theoretical framework, research design, nature and sources of data, population, sample and sampling procedure, tools and methods of data collection, data organization and processing, tools and methods of data analysis and study period covered. Fourth chapter is the presentation and analyses of data that provides the answers of the given research questions and justify the objectives of the study. It deals with the trend and composition of financial statement of the programme, socio-economic impact of the programme in the study area, and major problems, challenges and prospects of that programme in the study area. Finally, fifth chapter is major findings, conclusion and recommendations.

CHAPTER - II

REVIEW OF LITERATURE

2.1 Conceptual Framework

Based on the topographic features, Nepal can be divided into three distinct physiographic regions namely Terai, Hills and Mountains from south to north, and these regions run parallel across the length of country from east to west. The Terai region is the country's southern flat plain with low elevation (60m in east to 300m in west) and is a northern extension of the Indo-Gangetic Plains. With its width of 25-32 km, and 17% of the total land mass it accommodates about half of the total population of the country. This region is the food basket of the country, and accounts for the half of the total agricultural production. Lying north to Terai is the rising land called Churia or Siwalik belt with an elevation up to 1800m. It is the southern lowest range of Hills and occupies about 13% of the country's area (NPC 2004).

Most part of Churia is covered by forest while some parts are inhibited and cultivated. Increasing human interferences and expanding infrastructures coupled with climate vagaries on top of its own fragile composition are causing serious threats to this region. It has varying elevation, climate and vegetation from one to another part. Churia area has been considered to be very important for conservation to protect Terai and its agriculture. The rivers/streams that originate from Churia are ephemeral in nature with surplus water flow during four wet months (June-Sept) while very little or no water flow during rest of the year. These streams are characterized by flash floods. Churia is made up of highly fractured sedimentary rocks and have low groundwater retention potential. During wet season, rainfall amount exceeds by far the infiltration rate in the Churia hills; which coupled with its sloppy land generate flash floods, and retains little water to discharge during dry season. During dry season, those streams dry up in the Bhabar area as in the first instance there is little water to flow, a part of which infiltrates in the ground due to its pervious soil, and remaining water moves underneath the heavy sand/gravel deposited in streams (which has raised the river bed) in this area as opined by hydrologists.

The water re-appears few kilometers down in Terai plain area. As the river moves down south in the Terai plains, volume of water is observed increasing which is due to groundwater seepage into it. Bhabar is a gently sloping narrow belt in between Churia and Terai. There is no clear delineation of Bhabar zone differentiating it from Terai, but this area is usually recognized by its soil structure around the foothills of Churia. Its estimated area is about 4014 sq.km, and is made up of mainly boulders, cobbles and pebbles. Being highly pervious with its coarse formation, it has a higher percolation rate that turns river channels of Churia origin dry during most part of the year in this region. The percolated water contributes to the groundwater of Terai, and thus, this area needs to be protected from unwise infrastructure development to ensure sufficient groundwater recharge in Terai (Karna, 2007).

2.2 International Context

Nath (2005) analyzed about the integrated watershed management approach using a holistic approach for the sustainable development of rural based communities in the countryside. Several successful experiments of the country have shown the path in this direction. The people's participation is the key to development based on such projects because it deals mainly with the common property resources like forest, water and land. The major components of development through watershed approach can be broadly categorized as ecological sustainability, economic sustainability and social sustainability of 6 selected project villages in Punjab Shivalik. All the components are mutually dependent on each other however the people's participation is the critical dimension to sustain the development process. The sustainability of the watershed project depends on the ecological and technical parameters like construction of water harvesting structures; soil and water conservation measures etc.

Yangchan (2015) analyzed soil and water are considered as one of the world's limited and non-renewable resource. Soil erosion by water is being increasingly recognized as a problem across the world. The objective of the study was to assess the impact of resource conservation interventions on water and sediment yield in a watershed. Morphometric analysis of Sukhna Lake watershed covering Chandigarh, Punjab and Haryana was carried out by using GIS technique. This analysis shows that the basin has a dendritic pattern with

fifth order stream. Bifurcation ratio, drainage density, drainage texture, elongation ratio and relief ratio value of the watershed confirm that the geologic structures do not distort the drainage pattern. The area was impermeable subsurface having sparse vegetation, hilly relief and steep slopes with very fine texture cause prone to soil erosion. Impact analysis for six scenarios have indicated that in the initial period (1958-70) rainfall was less but runoff percentage was 22% of rainfall, no soil conservation measures were present due to which heavy soil loss of 150 ton/ha/yr, where as in 2013 rainfall was high but runoff percentage significantly decreased to 7.8% of rainfall due to increased number of structures over 190 as a result the sediment yield also decreased to 5 ton/ha/yr.

The study showed that an adequate soil conservation measure exists, as result creations of new strictures are not required. In order to retain the sediment yield, the structures need regular maintenance. High evaporation rate in the region causes drying of the lake as the capacity has reduced from 10.74 million cubic meter (MCM) initially to 5.24 (MCM) at present, almost 50% of the lake's capacity reducing the depth of lake. In case of afforestation preference should be given to drought resistant species and deep rooted plantation. However the sediment yield has reduced to 5 ton/ha/yr but from the catchment of 4284 ha it is a huge amount settling down in the lake and reducing its capacity. In such case periodic desilting has to be taken up once in 2-3 years. To maintain the required water level in Sukhna Lake on a sustainable basis throughout the year, strategies must be made to divert the water from the other adjacent catchments.

2.3 Nepalese Context

Thapa and Weber (1990) aimed to contribute to formulating an environmentally and economically sound watershed management planning concept and framework by investigating inherent problems of natural resources management and agricultural development. The study was done on the basis of assorted information on forest and pasture management, farm land management, and livestock management; land-use maps; related references; and different statistical tools.

The study pointed out that despite the people of Pokhara valley and their involvement in the management, forest resources were gradually degrading and being destroyed. The factor analysis of the study shows accessibility as the single most important factor

influencing the watershed management. The reasons for the deterioration of the socio-economic and environment conditions of watersheds are the steadily growing population and the limited land resource base; tenant cultivators and migrats; ridge cultivation and short fallowing; population growth and miniaturized landholding; large number of livestock; and decline in farm produced fodder and fuel wood supplies. Sustainable ecological balance and promotion of economic development can be achieved through the transformation of subsistence economy to market oriented economy. The major causes of land use change are expansion of agricultural lands, fuel wood, fodder and livestock grazing.

Ale (2005) aimed to assess the impacts of the Harpan Khola on its locale. The study conducted both secondary and primary data by qualitative analysed. The houses were counted and the sample size of the households of the study area was limited to 30% of the total households. The study about the socio-economic aspect of the selected area of the watershed excluding the infrastructural development. The environmental impact includes the made by the floods. The economic impact includes the impact of the floods on the crop production of the surrounding villages. And the social impact includes only on the migration pattern of the locals. The study found that Harpan Khola of Phewa watershed has various direct and indirect impacts on the villagers nearer to its bank. The river has direct environmental impact on the villages of the study area and thus bringing indirect socio-economic impacts on the residents of the villages. The resident survey conducted on the study area figures out the inequality of the impacts across the villages.

CARE (2005) aimed of the study were to: investigate how the settlements in Churia and the foothills have contributed to the conservation or degradation of Churia over the years analyze the existing policies to identify gaps and opportunities for Churia conservation through local participation and propose possible options to address the gaps generate awareness and ownership of the Churia problems at local and national levels. The entire methods of the study remained participatory as it was designed to be a PAR, which remained as a flexible spiral process which allowed action (change, improvement) and research (understanding, knowledge) to be achieved at the same time. Such understanding motivated towards more informed change and at the same time is informed by the change.

Finding from the field indicated that there is a direct correlation between size of landholdings and livestock rearing, which eventually manifests in the level of food sufficiency of the HH. And, has also inversely proportional relation to the pressure on and exploitation of the forest resources. Yet, another feature of the study area, despite the fact that only 18 percent of the HH support for the whole year with their own production, is the less diversified nature of the source of the livelihood. People largely depend on wage labour after agriculture. Thus, the findings from the field suggest that for sustainable conservation, entitlement of the land rights to the cultivators, and then identification and diversification of the portfolios of the livelihood can be proved two major strategies.

Karna (2007) aimed to estimate the economic value of key goods and services provided by Churia hills region to local actors (both upstream and downstream) and will explore the possibilities of developing innovative mechanisms to raise financial resources for the sustainable management of the region, and to overcome current financial and economic constraints to conservation. More specifically, the study aimed: (I) to assess the economic value of select goods and services provided by the Churia watershed, (II) to assess the possibility of piloting innovative financial measures such as payment of environment services (PES) that can act as incentives supporting conservation and management efforts. The study was based primarily on information collected from four study sites across the length of Churia hills, which were selected in consultation with all the study partners. Assessing the importance of water from Churia to downstream agriculture is an important intention of the study, and thus, selection of sites for case study were limited to few sub-watershed area that drains water into a particular stream. Based on secondary information, this study had identified Ghodaghodi lake (Kailali district), Banaganga watershed (Kapilvastu district), Jaladh watershed (Dhanusha district), and Chanju/Bagdwar watershed (Ilam district). The study was carried out with the major objective to assess the economic value of selected goods and services from Churia region that are of direct relevance to the livelihoods of surrounding communities, and to see the possibility of piloting innovative financial mechanisms for the sustainable management of the region.

Maharjan et.al., (2009) presented the findings of a study investigating the livelihood impact of community forestry in eight community forest user groups in the Churia part of the Terai region. Impacts were found to be very variable within and between user groups and not

easily explained by any single factor. A general finding, however, was that, community forestry shifts benefit flows from individual households to the community level. This means that promotion of fair representation and active participation by the poorest is needed to ensure that they gain access to the new community-level decision-making fora and the resources managed at this level.

Sing (2012) aimed (i) to assess the positive and/or negative effects and impacts of river on upstream and downstream people by the river originated from the Churia hills, (ii) to examine whether river-affected people have been recognized as stakeholder or not in the conservation and management of watershed resources and why, and (iii) to study whether the river-affected downstream people are included and/or excluded in the decision-making process of watershed management or not. The study has been conducted based on Freeman's Stakeholder theory which states “any group or individual who can affect or is affected by the corporations” are stakeholders. Based on theoretical framework of the stakeholder theory, the main research question is whether the river-affected downstream people are considered as stakeholder or not in the conservation and management of watershed of Jalad River distributed at Churia hills, the main source of silts and sediments that is loaded into flood water. In this research, Churia and Terai have been linked on the perspective of environmental services mainly watershed services.

Pokhrel (2013) has attempted to identify the problems and issues of Chure forest conservation and to prepare conservation and management plan using qualitative as well as quantitative methods of analysis. The study is based on field study so that the description of the paper was made on the basis of primary data that were collected during the field study in Arghakhanchi district. The study has pointed out that the ecological, geographical and bio-physical conditions of the Chure Region have rapidly degraded since the last 32 years. Increasing landslides and flooding; and human intervention makes Chure more fragile and weakest zone where lack of/inadequate livelihood assets and food insecurity are noted. However, Chure Region has many opportunities of employment and income generation through establishment of environmental friendly green enterprises. Thus, the study concludes an urgent need to formulate short-term to long-term strategies with policy priorities actions and result-oriented efforts. The policies and strategies should be related to establish Chure as a rich bio-diversity zone, with hazardless and improved livelihoods.

NFTA (2013) studied about the socio-economic impacts of Chure deterioration. The main objective of the study was to study about five rivers of related five Chure districts. The study was conducted through primary and secondary data with qualitative data analysis. The study area has got five river system – Pasaha, Vedaha, Chandi, Charnath and Tawa River. It has been found that due to flow of Tawa river annually the life of 2-3 people have been destroyed and the Chadi , Charnath, Pasaha Khola have injured the local people. In addition it has found that 236 kattha land has been damaged and a financial loss Rs 6,40,000 has been recorded.

Biswakarma (2016) identified two broad strands of contested actors: the ones who strongly favor the government policy decision and those who are opposing it. The study was based on review of relevant literature, direct observation and participation in the national and regional policy dialogues and public debate. They argued that this can be attributed to the competing understandings of the problem and the proposed solutions to the Chure conservation. Actor's understandings of the Chure are based on their own identical political strands and do not necessarily reflect the underlying causes at the ground. The politics of scientific facts and evidences is also critical to this contestation. The study identified three major strands of management approaches in the Chure discourse: state centric, community based and state-community collaborative. Deliberative scrutiny of current policies and attention to the political ecology of conservation could help arrive at negotiated understanding of the problem and sustainable approach to the Chure management.

Bjarnlid (2016) explored the Chure intervention and its effects through a theoretical framework based on theories of governmentality from three theorists. The thesis has two correlating objectives. First, to explore how the Chure conservation policies and regulatory decisions within the Rastrapati Chure Conservation Program has affected individual community forest users and groups in their day-to-day lives thus far, and how these forest users are responding to the policies and regulations. Secondly, the study aimed to contribute to understanding some of the factors which has shaped these conservation policies and what justification the government is using to validate the intervention. The study was conducted in a qualitative field study in Kathmandu and Chitwan. With the findings from the research and the theoretical framework, the thesis attempted to explain why the government has implemented the Chure intervention, how they justify it and what

effects and response the intervention has generated in a local Chure community in Chitwan district. The result suggests a change in rationality and problematization of forest degradation within the government and a change in practices which justifies the shape of and chosen solution to the Chure intervention. The community forest users' representative organization is actively protesting and opposing the Chure intervention but on local level effects have yet to reach individual households. However, the effects of reduced communal funds are on the verge of reaching especially the poorest groups.

Pandey (2016) studied of the Chure Conservation Area where conflicts have arisen between the government authorities and local communities over the issue of who will manage and use the natural and biological resources of the region. Expressing its deep concerns over the rapid degradation and misuse of the resources of the Chure Region, the government has taken a bold initiative to form and mobilize a centrally-governed high-level committee for the conservation of the area. In this backdrop, this study—which also includes an analysis of the views expressed by stakeholders during interviews and focus groups discussions—presents a case of the status of plans, policies and laws of the country that significantly impact the conservation and use of natural and biological resources of the region. The study also presents a brief analysis of the related international agreements that shape Nepal's policies and laws for the conservation of natural and biological resources and the protection of the rights of local communities. This study offers a broad overview of how the management of natural and biological resources has always been an area of concern and debate among scholars, policymakers and development practitioners. Before presenting the case of the Chure Region, the study discusses different property regimes for resource management, such as state property, private property and common property. The idea is to develop some clarity around the options for the management and use of natural and biological resources. One of the recommendations of the study is that the conflicts over the management of the Chure Region cannot be addressed without building trust and cooperation between and among government authorities and local communities. Another recommendation is to build the capacity of local communities by recognizing their rights in relation to the management and use of resources.

Karki et.al. (2017) designed as a pilot project aimed at addressing above issues especially focusing on reducing forest and agriculture land degradation, water shortages and

biodiversity loss by incentivizing local communities with different kinds of livelihood opportunities especially through forest, pasture and agriculture land based income generating activities. The project area covered Churia hills and Bhawar areas of Rautahat, Bara, Parsa and Makwanpur districts. The overall objective of the project was to “to substantially reduce degradation and maintain or improve conditions of agro-pastoral lands and Churia Sal and mixed forest areas in strategic project locations.” The specific objectives were: a) promote sustainable agricultural and livestock management practices; b) engage local communities in livelihood oriented forest conservation; and c) create the enabling conditions for inter-sectoral collaboration for sustainable land use and management. Specific project targets were: a) substantially reduce degradation in 2,500 ha of agro-pastoral lands, and improve management of 5,000 ha of forests through integrated and community participated land and watershed management work in strategic locations.

PCTMCP (2017 a) adopted the vision of ensuring the sustainable availability of the environmental services through execution of the erosion-mitigating activities keeping into consideration the existing situation when there is increase in the people’s grief and disaster owing to the decline in the productivity caused by the deterioration in the Chure environment leading to uncertainty of the environmental services. In this MP that has been prepared for the 20-year period, the action plan for the first 5-years, and on the basis of the same, the programs projected for the coming 10, 15 and 20 years have been included. The overall image of the conservation, analysis of the existing scenario and management of the Chure-TaraiMadhesh Landscape has been incorporated in the MP. The integrated river system management plan, of the 64 river systems, that will be implemented in the first 5-year period has been incorporated in the first complementary section of the MP.

Similarly, the district-wise plans of the 36 districts touched by the Chure region have been included in its second complementary section. In addition to this, the different supporting documents prepared in course of the preparation of the MP have been incorporated in the MP. As the geo-biological and socio-economic aspects have affected upon the status of the Chure, the analyses of both these aspects have also been included in the MP.

Sing (2017) explored the status and issues related to the management of and land tenure in the Chure region. The study found that land tenure is one of the most contested and

challenging issues of conservation in Chure. With the presence of significant human settlements near to Chure Environmental Protection Area, the boundary is contested, particularly after the unilateral designation by the government; issues also remain around the rights to utilize forest resources. In fact, these factors have resulted in over exploitation of the resources, mainly by the upstream communities. The conclude the paper arguing for a broader, holistic approach that integrates upstream and downstream ecosystems in such a way that strengthens the historical socio-ecological links between the Chure region and the Terai so as to bring positive impacts for both.

2.4 Research Gap

The given review of the literature showed that there are only few studies that showed the impact of conservation programme implemented in various areas. On the top of that, there is only few studies about the socio-economic impact of the PCTMCP of Nepal in Rupandehi district but not in Devadaha Municipality. In addition, studies on the problems, challenges and prospects of the programmes are lacking. Thus, the study will be helpful to fulfill the vacuum of studies related to the PCTMCP in the study area.

CHAPTER - III

RESEARCH METHODOLOGY

3.1 Introduction and Selection of the Study Area

Among the 37 Chure affected districts, the study is based in Rupandehi district. Rupandehi District (Appendix-II) is among located in Province no. 5. This district is famously known as the birthplace of Lord Gautam Buddha. It ranges from $83^{\circ} 12' 16''$ to $83^{\circ} 38' 16''$ eastern latitudes to $27^{\circ} 20' 00''$ to $27^{\circ} 47' 25''$ northern longitude which covers the area of 1360 sq km. It has Nawalparasi (Western) in East, Kapilvastu in West, Palpa district in North and U.P. of India in South as its boundaries. It has the altitude of 100 to 1228m from sea level and it occupies an area of 1305 km². On the basis of physiographic condition, it is divided into Siwalik, Bhabar and Terai. The Churia and Bhabar region occupies the area about 376.7 km² (28.8 percent) of the district. It has 163996 households and 880916 total population which comprises 432193 male and 448003 female (Census 2012). Politically this district has one Sub-Metropolitan, five Municipality and ten Village Committee. One of them the study is located in Devadaha municipality (Appendix-II). In this municipality, the Himalayan range of height 300 m to 1162 m is called the Chure area. Total area of this range is 30.62 km (31.48 percent).

The Devadaha Municipality is formed in 2016 (2073 B.S.) having twelve ward at present through the combination of Devadaha and Kervani V.D.C. Total population of the Municipality is 53523 where the population of male is 24,841 and that of female is 28,682 having the 11,410 (CBS 2012). The total area covered by the Municipality is 136.95 sq.km. The literacy rate of the municipality is 75 percent at present. There are 19 primary, 25 secondary schools, 2 general campus and 1 technical campus. There are 5 primary health centre, health post, sub-health post and health unit and 1 private hospital having 300 beds. The main point of tourist attraction are Bhawanipur, Devadaha, Pakari Brikshha, Khayaradanda, Kanyamai, Mathagadhi, Simsara, Rohininagara, etc.

Being the plain land of Terai, majority of the people are involved in agriculture. The agriculture is of primitive type. Normally rice, wheat, maize, mustard, sugarcane, potato

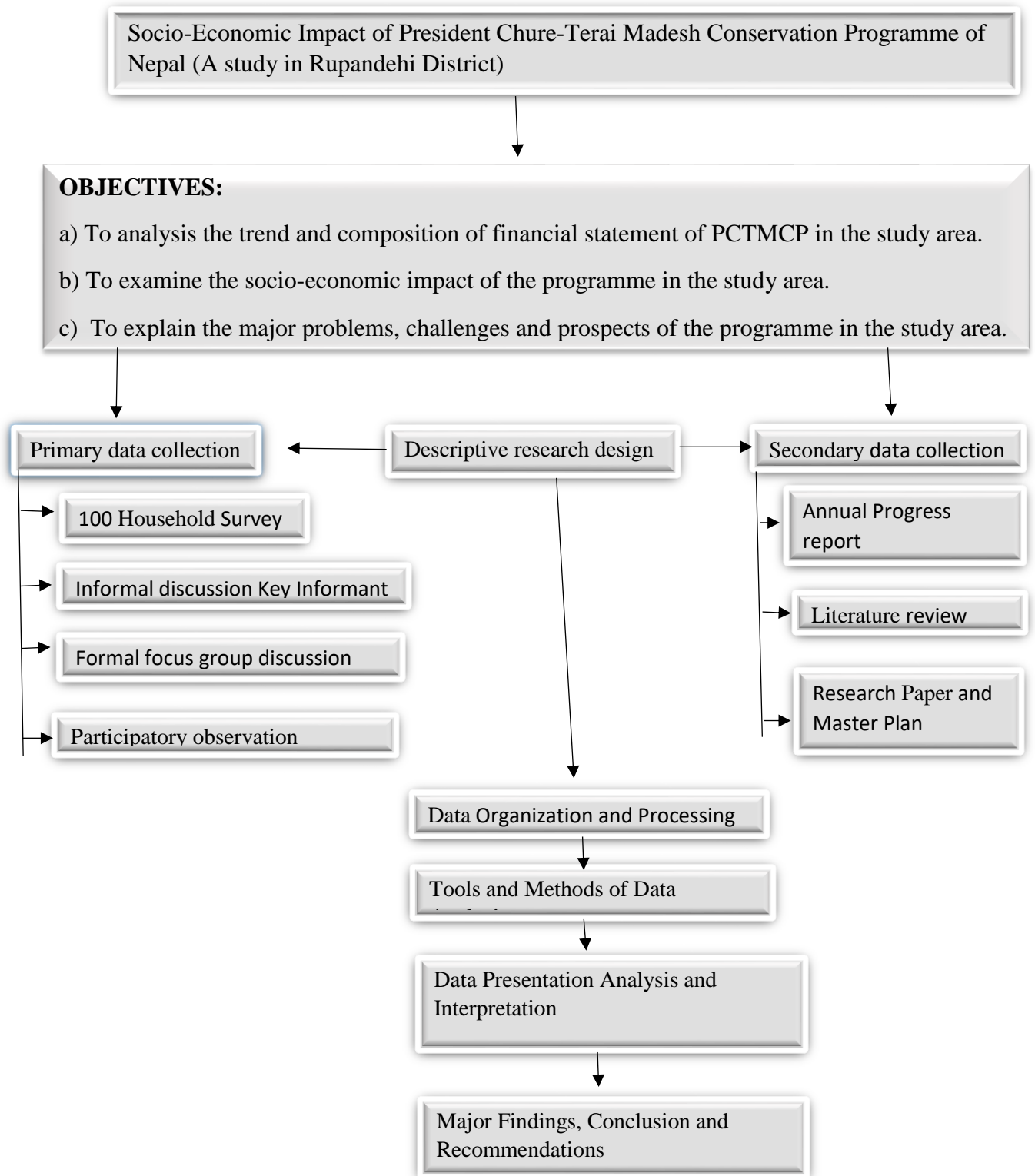
are the major crops produced in the study area. Business is the main occupation in the urban area and they run dairy and others. In the other side, some are engaged in private and governmental jobs and other labour works. Khaireni, Shitalnagar, Bhaluhi, Bhawanipur, Dhekawar, Shankarpur, Rampur Chauraha, Sadoniya, etc. People go to India and other countries for employment. The main point of tourist attraction are Bhawanipur, Devadaha, Pakari Brikshha, Khayaradanda, Kanyamai, Mathagadhi, Simsara, Rohininagara, etc.

Due to the high availability of the PCTMCP in the Devadaha Municipality of Rupandehi District hence, the study have been done in the Devadaha Municipality. It is run by the name Ghodaha river system by PCTMCP. It is elongated north to south and occupies an area of 24.46 km². Its length is about 11.9 km. The Ghodaha khola is Main River and Rohini, Bhaluhi and Sukaura are secondary tributary who meet in the outlets of this river system (DSCOR, 2017).River system management is the important part in Chure region. The agricultural and animal husbandry can be promoted by the programe that ultimately help for socio-economic development of the local residence. The study has taken the Ghodaha river system which is located in Devadaha Municipality in Rupendehi district as a study area.

3.2 Theoretical Framework

The theoretical framework explain the path of a study and grounds it firmly in theoretical constructs. The overall aim of the theoretical framework is to make research findings more meaning full. It guides and should resonate with every aspect of the research process from definition of the problem, objectives, literature review, methodology, presentation and discussion of the findings as well as conclusion and recommendations are drawn. The study has also given theoretical framework.

Figure: 3.1 Theoretical Framework



3.3 Research Design

The study is designed in accordance with getting answers of the given research questions and justifying objectives of the study related to the socio-economic impact of the programme namely PCTMCP. It was the explanatory type of study using both of descriptive and analytical method. Both qualitative and quantitative primary and secondary and information were used. The collected data and information were analysed under the inductive method with the help of table, graphs, percentage, ratio, average, and simple mathematical tools.

3.4 Nature and Sources of Data

The study is based on both secondary and primary sources of data and information.

3.4.1. Secondary Source

The secondary data and information were collected from various book, booklets, research report, journal, magazine, etc. published by various concerned institutions like government of Nepal, CBS, PCTMCDB, department of Forest and Soil Conservation in Rupandehi District, Devadaha Municipality etc.

3.4.2. Primary Source

The primary data and information were generated from the selected study area through the field survey by the researcher herself.

3.5 Population, Sample and Sampling Procedure

The size of population of the study became the total households in study area was 2116 (in ward n. 6 and 7) (NPHC, 2011) who are socio-economically affected by the PCTMCP. From the total affected households, 100 households were selected as sample size of households which means 4.73 percent of the total HHs. The required sample households were selected with the help of random sampling procedure with lottery method.

3.6 Tools and Methods of Data Collection

The required primary data and information were collected with the help of four different tools like household interview with the sample households, informal discussion with key informants, formal focus group discussion, and participatory observations.

- a) **Household Interview:-**The required data and information were collected through the personal interview with the help of a set of pretested structured questionnaire (Appendix-III) that were pretested in the Sainamaina Municipality near to the study area before the collection of data. An interview was carried out by going through door to door in the study area (Picture: 1). If, the particular sample household was absent or found missing, the nearby household was used as sample household.
- b) **Informal Discussions with Key Informants:-**The household survey was supplemented by the informal discussions with the local people during the period of field visit at the common place of the study area covering different aspects of the study with a set of guidelines (Appendix-IV). The key informants were three person representing of PCTMCP, one person political leader, two person social workers, one person teacher, two persons senior citizens, and other knowledgeable persons of the study area.
- (c) **Formal Focus Group Discussion:-** In other to understand existing activities of the programme, major problems, challenges and prospects of the programme, a focus group discussion was also be conducted during the study period of field visit at the premises of Devdaha Municipality through a set of guidelines(Appendix-V). The participants in the discussion programme were local people from the affected and non-affected households from the programme, and selected concerned persons of the PCTMCP. The underneath (Picture: 2) shows the information collected through the group.
- d) **Participatory Observations:-**Some visible information in the study area were closely be observed by the researcher herself taken photographs and recorded by the researcher herself regarding general life style of local people, socio-economic characteristics, economic activities, women participation in the study area etc. Similarly, some effective and approvable facts to the study as per the self of observation will be noted down (Appendix-VI). However, the main purpose of direct observation was to verify the collected information with the ground reality.

3.7 Data Organization and Processing

The collected data and information were in raw form by nature and were not possible to present and analyse them directly. Hence, it was necessary to process the raw data and convert it into required forms. The collected data and information were edited, organized, classified, simplified, and calculated in accordance with the nature of collected data and information. It was put into a single master sheet and processed through the computer package in order to achieve the answer of the given research questions and justify the desire objectives of the study.

3.8 Tools and Methods of Data Analysis

The study had been conducted to use various tables, graphs and simple mathematical tools like percentage, ratio and average etc. Behinds, both descriptive and analytical methods were used for data analysis and interpretation of collected data and information by using SPSS computer soft.

3.9 Study Period Covered

Due to the unavailability of data before fiscal year 2014/15 so, the study covered the data from fiscal year 2014/15 to 2017/18 after the implementation of PCTMCP. Secondary data were collected in December, 2018 and the primary data were collected in January, 2019.

CHAPTER - IV

DATA PRESENTATION AND ANALYSIS

This chapter is mainly concerned with trend and composition of investment made by PCTMCP and the features of sample HHs of the study area and socio-economic impact of PCTMCP. So, the analysis of the chapter is based on both secondary the primary information / data collected at household level through field survey. The chapter is broadly divided into four major sections like demographical features of the sample households, trend and composition of investment made by PCTMCP, socio-economic and environment impacts and problem, challenges and prospects of PCTMCP. In primary data analysis before represents before the implementation of the PCTMCP (2014) and after represents after the implementation of the PCTMCP (2014).

4.1 Features of the Sampled Households

The study was conducted in the certain part of Devadaha Municipality covering the total population of 492. Feature of the sample HHs of the study area found are given bellow:

a) Age Group Distribution of SHHs

Age composition refers to the share of given population that goes to the given different age groups. It means that how many people fall in different categories of given age group of population. The study made five different age groups from bellow 15 to above 60 years as shown in given table 4.0.

Table 4.0: Age Group Distribution of the Population of SHHs

Age-group	Male	Female	Total	Percent	
				M	F
Below 15	46	40	86	53.45	46.51
15-30	58	55	113	51.33	48.67
30-45	90	86	176	51.14	48.86
45-60	47	42	89	52.81	47.19
Above 60	16	12	28	57.14	42.86
Total	257	235	492		

Source: Field Survey, 2019

The Table 4.0 shows the age group and their percentage in the study area. In the age group of below 15 years, there are 53.45% male and 46.51% female. The age group of 30-45 years has got majority of the population which comprise of 51.14% and 48.86%. In the economically active population (15-60 years), there is the percentage of 76.81. The table shows the detail of other age group.

b) Household Head of SHHs

Since there is a patriarchal society in Nepal, it is very common to be male-headed households. There were also female-headed households where there is no adult male member or death or migrated for a long duration for job or in abnormal condition. In Nepalese society, the eldest male member of a family holds the highest position in the family and gets high social status and he usually becomes the head of the household. The household head takes most of the major decisions in the household and community affairs. As rural community is a highly male dominated society, the sample households were also not exceptional to the facts as shown in given table 4.1.

Table 4.1: Household Head of the SHHs

Head of HHs	No of HHs	Percent
Male	70	70
Female	30	30
Total	100	100

Source: Field Survey, 2019

The table reveals that there are highly male-dominated households in the study area. Most, around 70% of the household has got male member as the head of the family. There were very less number of female-headed households so that women have very less significant participation in decision making of household affairs and they could play only a secondary role in the affairs of the household and also in community. But there is a general belief that female could manage and run household matter more economically than her male counterpart. If other things being equal, a female-headed household might be relatively better off than male-headed households.

c) Ethnic Distribution of SHHs

As Nepal being a multi-ethnic and multi-cultural society, the sample households also have got different caste and ethnic community as shown below in table 4.2.

Table 4.2: Ethnic Distribution of the SHHs

Caste	No of SHHs	Percent
Brahamin	31	31
Chhetri	11	11
Janajati	44	44
Dalit	9	9
Others	5	5
Total	100	100

Source: Field Survey, 2019

The Table 4.2 shows that SHHs area is multi-ethnic society. It has got the different castes. The Brahamin has got 31% stake in the society. The Janajati occupies 44% weightage in the society, Chhetri 11%, Dalit 9% and the others 5%.

d) Class Distribution of SHHs

The Nepalese society has got variation in the level of earning which determines the class of the people. In the same way, the study area has got various class which is listed in table 4.3.

Table 4.3: Class Distribution of the HHs

Class	No of SHHs	Percent
Upper	6	6
Middle	75	75
Lower	15	15
Poor	4	4
Total	100	100

Source: Field Survey, 2019

The study area has got the differences in the wealth. There are around 6% upper class, 75% middle class, 15% lower class and 4% in poor category. They have got the differences in the earnings too.

e) Religion

The table 4.4 shows the religion-wise population of the sample households which shows the higher percentage of Hindu population in the of study area.

Table 4.4: Religion of SHHs

Religion	No of SHHs	Percent
Hindu	73	73
Buddhist	18	18
Cristian	6	6
Others	3	3
Total	100	100

Source: Field Survey, 2019

The table reveals that people of different religion are found the area. Hindu has got the weightage of 73%, Buddhist 18%, Christianity 6%, and the others 3%.

f) Occupational Distribution

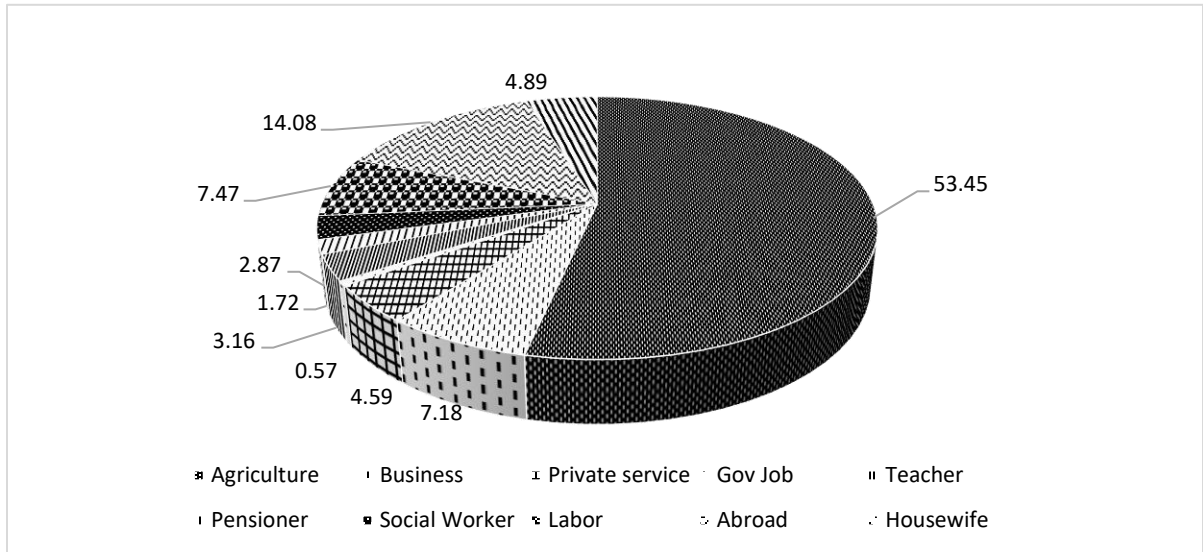
Agricultural along with livestock keeping is regarded as the backbone of the economy for the nations so as to in the study area as well. As shown in given table 4.5 and figure 4.1, agriculture along with livestock keeping provides major occupation as a major source of income in all the study area.

Table 4.5: Occupation of the Population of SHHs

Occupation	Male	Female	Total	Percent
Agriculture	57	129	186	53.45
Business	16	9	25	7.18
Private service	10	6	16	4.59
Gov Job	1	1	2	0.57
Teacher	8	3	11	3.16
Pensioner	6		6	1.72
Social Worker	8	2	10	2.87
Labor	20	6	26	7.47
Abroad	47	2	49	14.08
Housewife		17	17	4.89
Total			348	100

Source: Field Survey, 2019

Figure 4.1: Occupation of the Population of SHHs



Source: Table 4.5

It has been found that most of the people are engaged in the agriculture. In the agricultural sector also, more female are engaged than the male. The percentage of male is 43.59 whereas that of female is 56.41. Most of the male population have enrolled in foreign employment.

g) Educational Status

Education is regarded as the most important driving force in achieving social-economic and technical growth and development. It is a human capital by which individuals could progress their abilities and give them to a rational direction. So, having natural resources irrespective of types can do nothing without education. The educational status of the population of the sample households was as shown in given table 4.6.

Table 4.6: Educational Status of the Population of SHHs

Education	Male	Female	Total	Percentage	
				M	F
Illiterate	11	24	35	31.43	68.57
Literate	209	206	415	68.57	31.43
Primary	64	72	136	47.06	52.94
Secondary	69	62	131	52.67	47.33
10 +2	42	29	71	59.15	40.85
Diploma	31	15	46	67.39	32.61
Degree	3	3	6	50	50
Total	220	230	450	100	100

Source: Field Survey, 2019

The study shows that the highly educated female is less than the male. There is 31.43% male and 68.57% female illiteracy rate.

h) Language

The Table 4.7 shows the different language spoken population of the sample households.

Table 4.7: Language Spoken of the SHHs

Language	No of SHHs	Percent
Magar	40	81.63
Gurung	5	10.20
Others	4	8.17
Total	49	100

Source: Field Survey, 2019

Though all the people in the area speak Nepali language, majority of them have got Magar (81.63%) and Gurung (10.20%) language as their mother tongue.

4.2 Trend and Composition of Financial Statement of PCTMCP

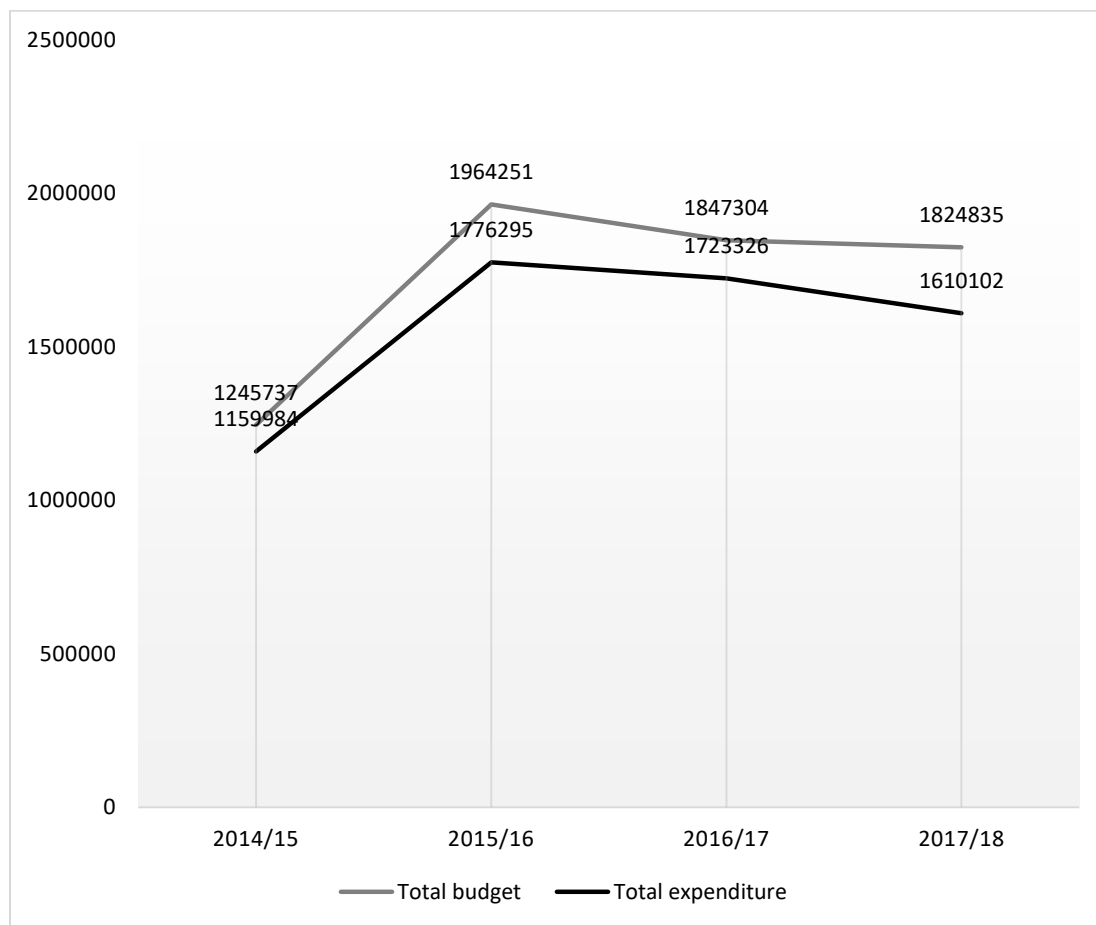
PCTMCP has been started since FY 2010/11 but the major implementation started since FY 2014/15. The budget allocation and expenditure from 2014/15 have been listed in table 4.8.

Table 4.8 Total Financial Statement of PCTMCP (Rs in thousand)

Fiscal Years	Total budget	Total expenditure	Financial progress (%)
2014/15	1245737	1159984	93.82
2015/16	1964251	1776295	90.92
2016/17	1847304	1723326	93.29
2017/18	1824835	1610102	88.16
Total	6882127	6269707	91.10
Average	1720531.8	1567427	91.10

Source: Rastrapati Chure Terai Madesh Conservation Board, Khumaltar

Figure 4.2: Total Financial Statement of PCTMCP



Source: Table 4.8

In the FY 2014/15 the expenditure was 93.82% of the budget allocated. In initial days of 2018/19 the investment is 5.31% where the budget allocated is 1699700 thousand. The table shows that there is the problem in the amount of expenditure which is not as per the budget allocated.

4.2.1 Sector Wise Financial Investment of PCTMCP

PCTMCP allocated its budget through different departments of the government which are agriculture, forest, soil and water, Nepali Sena, etc, are shown in table 4.9.

Table 4.9: Sector Wise Investment Made by PCTMCP (Rs thousand)

Line	FY 2014/15			FY 2015/16			FY 2016/17			FY 2017/18		
	Budget	Exp	F.P.	Budget	Exp	F.P.	Budget	Exp	F.P.	Budget	Exp	F.P.
Agencies	N/A	N/A	N/A	N/A	N/A	N/A	2200	2000	90.91	N/A	N/A	N/A
RegForest	N/A	N/A	N/A	71104	60279.	84.78	400	288	72	N/A	N/A	N/A
Reg Agri	N/A	N/A	N/A	40784	353682	86.72	400	400	100	N/A	N/A	N/A
Reg.Pashu	N/A	N/A	N/A	N/A	N/A	N/A	9000	8313	92.37	11059	9759	88.24
Ban talim	191177	174475	91.26	242153	212938	87.94	235303	223855	95.15	263463	234854	88.14
DFO	255919	244867	95.68	365829	341344	93.31	372631	360422	96.72	417601	384420	91.89
DSCO	24954	22441	89.93	21736	18800	86.49	21735	19820	91.19	23521	22057	93.78
Banaspati	17742	15885	89.53	36863	32585	88.39	33638	29031	86.30	27917	25513	91.39
NPWLR	6090	300	4.93	7300	3500	47.95	10000	9453	94.53	14241	14241	100
Research	472542	444664	94.10	866538	812246	93.73	806239	765805	94.98	556061	542626	97.58
Water	73190	67620	92.39	71104	60279.2	84.78	65459	61609	94.12	36197	29871	82.52
Agri	44565	43215	96.97	40784	35368.2	86.72	32937	31702	96.24	34701	28897	83.27
Livestock	26103	26103	100	86317	86317	100	88452	88452	100	78800	61133	77.58
Nepalisena	1159.985	1159.985	100	3000	3000	100	3000	2688	89.60	3000	2695	89.83
Regional	134160	120415	89.75	220377	178306	80.91	5616200	4699600	73.52	358474	254038	70.87
Samiti	1247601	1161145	93.07	1926001	1784683	90.96	7285594	6292437	86.37	1813976	1600345	88.22
Total												

Source: Rastrapati Chure Terai Madesh Conservation Board. Note: N.A = Not Available

The table shows that major investment is made in water related problems, soil conservation and forest conservation. But the investment in agriculture is not so much as expected. The programme carried on by Nepal Army have seen greater completion.

4.2.2 Total Financial Statement of PCTMCP in Rupandehi

The PCTMCP are carried on by Soil Conservation and Forest department of Rupandehi district. From the FY 2014/15 investment made by the PCTMCP are shown in table below.

Table 4.10 Financial Statement of Forest Office in Rupandehi (Rs in thousand)

Fiscal Years	Total Budget of PCTMCP	Total Budget (Rupandehi)	Percent	Total Expenditure	Financial progress (%)
2014/15	1245737	3425.00	0.26	3382.66	98.76
2015/16	1964251	4724	0.24	4529	95.87
2016/17	1847304	4824	0.26	4678	96.97
2017/18	1824835	4499	0.25	4366.51	97.06
Total	6882127	17472	1.01	16956.2	97.05
Average	1720531.8	4368	0.25	4239.04	97.05

Source: Annual Progress Report, DFO Rupandehi

The total budget allocated to Rupendhi district by PCTMCP is 0.24 to 0.26% of its total budget. The budget expenditure and the financial progress are in the better path.

Table 4.11: Financial Statement of Soil Conservation in Rupandehi (Rs in thousand)

Fiscal Years	Total budget of PCTMCP	Total Budget (Rupandehi)	Percent	Total Expenditure	Financial Progress (%)
2014/15	1245737	5040.00	0.41	5028.40	99.77
2015/16	1964251	5717	0.29	5717	100
2016/17	1847304	5721.00	0.31	5429.70	94.91
2017/18	1824835	7299.00	0.40	7249.40	99.32
Total	6882127	23777	0.35	23424.5	98.52
Average	1720531.8	5944.25	0.35	5856.13	98.52

Sources: Annual progress report, DSCO Rupandehi

Similarly, the budget allocated to the district is in the range of 0.29 to 0.41% and the financial progress is good.

4.3 Socio-Economic Impact of the Programme in the Study Area

Since 2014/15 PCTMCP has implemented the programme through Forest and Soil Department of government in Devadaha Municipality which has direct and indirect relation in forest protection, irrigation, drinking water and the construction of river dam, etc.

4.3.1. Economic Impact

Every programme is seen from the economic as impact as it is the major aspect of the programme. Economic impact is that portion which affects to the monetary part of the people. In the same way the PCTMCP has direct and indirect impact in the economic aspect of people. The irrigation availability, agricultural production, livestock rearing has created the greater impact on the life of people which is being supported by PCTMCP.

4.3.1.1 Land and Irrigation

In the agricultural-based rural economy, farm land holds an apex position as a part of fixed wealth that shows the socio-economic status of the households. Land is the main source of the livelihood for subsistence farmers in the study area. Land can be divided into Low land (*Khet*) where water is available through irrigation which is suitable for paddy cultivation, sloppy upland (*Bari*) without irrigation facilities that is mostly used for grown maize, wheat, potato and other vegetables. Total land and irrigation land of the study area has shown in table 4.12.

Table 4.12: Land and Irrigation by SHHs (in kattha)

Before 2014					After 2014				
Total Land	Irrigation Land	%	Non-Irrigation Land	%	Total Land	Irrigation Land	%	Non-Irrigation Land	%
815.5	468	57.39	345.5	42.37	633.3	322.5	50.91	305.5	48.22

Source: Field Survey, 2019.

The Table 4.12 shows that before the programme there was total land of 815.5 kattha where the irrigated land was 57.39% and non-irrigated land was 42.37%. But after the programme the total , irrigated and non-irrigated land are 633.5 katta, 50.91% and 48.22% respectively which shows that the total land owned has decreased during the period, due to the enlargement settlement area.

4.3.1.2 Sources of Irrigation

For the better production of the agricultural products different sources of irrigation are required and in the study area also there were different sources found. The table 4.13 shows about the land irrigated (kattha) by the different sources.

Table 4.13 Sources of Irrigation (Land in kattha)

Sources	Canal	River	Tubewell	Ponds	Liffting	Aakase pani	Tap	N/A
Before 2014	325	70	67	3	3	345.5		2
After 2014	86	7	84	133.5	4	305.5	6.5	5.5

Source: Field Survey, 2019. Note: N. A. = Not available.

The Table 4.13 shows that major source of irrigation are canal, river tubewell, ponds and rainfall. Before the programme the majority of the land was irrigated by canal and river. But after the programme the main source of the project is pond which is due to the efforts initiated by the programme. At this point of time too the majority of the people are dependent in aakase pani.

The study found some works done by PCTMCP in the field survey of the area for the increase in the irrigation availability which are listed below:

- a) **Recharge Pond:-** The aim of pond construction is to promote agriculture by irrigating the land. The cost of the construction of pond is Rs 275000 which is lies in upper Sarahan ward

n 6. It has the capacity of 1 lakh liter. The cost of the construction of the pond is Rs 4 lakhs which is made in lower Saharan ward n 6 (Picture: 3). It has directly benefitted 29 households. It has aimed for irrigation of 20 Bigha land.

b) Wetland: - It is made in Buddhanagar-9, Ghodaha in FY 2013/2014. The cost of it is around 4 lakhs. The main purpose of formation of wetland is for use by wild animal, to promote the eco-tourism and irrigation.

c) Dam Programme:- This programme is located in ward no-6, Jyotinagar (see photo) which was completed in 2018/3/28. Total investment in the project is 17082047. It has benefitted 850 households directly. It has aimed at storage of water, irrigation, beautification and stoppage of the river diversion. This dam (Picture: 4) is within Gautam Buddha National Garden.

4.3.1.3. Irrigation Availability

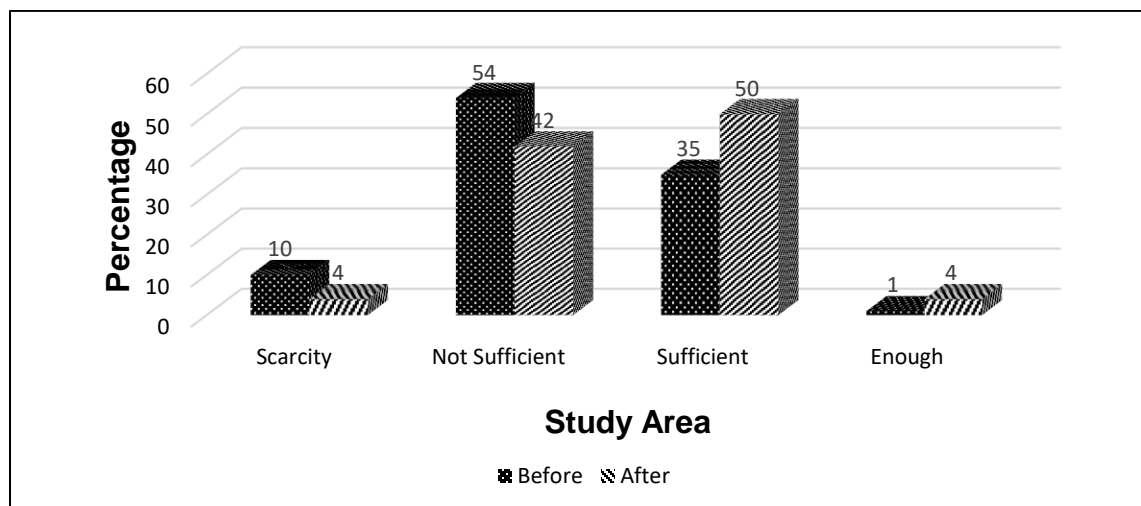
Nepal though being rich in water sources, there is lack of proper irrigation system for the agriculture. To know about the situation of irrigation in the study area, the following question were asked. What is the condition of irrigation availability?

Before 2014: a) Scarcity b) Not Sufficient c) Sufficient d) Enough

After 2014: a) Scarcity b) Not Sufficient c) Sufficient d) Enough

The figure 4.3 below shows the sufficiency of those facilities to survey households.

Figure 4.3: Availability of Irrigation of SHHs



Source: Field Survey, 2019

The study has revealed that irrigation facility in the area is not sufficient before and after the programme. But the sufficiency level of irrigation is increased from 35 % to 50%, due to the alternative sources of irrigation through ponds.

4.3.1.4 Reason behind the Changes in the Sources of Irrigation

The sources of irrigation may vary due to different reasons. In the study area also, the respondents have replied that the sources have changed due to different reasons which are enlisted table 4.14.

Table: 4.14 Reason behind the changes in the sources of Irrigation (SHHs)

Reason	PCTMCP	Local Gov Programme	Local People	Personal	Total
Percent	25	30	34	11	100

Source: Field Survey, 2019

According to the information collected, 34% people reacted that the change in the source of irrigation are due to the initiatives under taken by the local people. Only 25% people reacted towards PCTMCP.

4.3.1.5 Agricultural production and Cropping Pattern

Farming is the main source of income for most of the households of the study area. Like, paddy and maize were main monsoon crops and wheat, mustered and potatoes were the major winter crops. As most of the croplands had no irrigation facilities, the winter crops were not so much flourished. Moreover, lands nearby house are often used to grow vegetable like potato, cabbage, tomato, onion etc. for own consumption. Most of the households grow food crops like paddy, maize, potato and some other vegetable basically for their own consumption and sale. Due to the lack of irrigational facilities in the study area, a very less percentage of farmers are growing high yielding variety of crops. The level of agricultural production and its changing pattern can be shown with the help of given table 4.15.

Table 4.15: Agricultural Production of SHHs

Particulars	Before 2014			After 2014			Change (%)		
	Prod	Con	Sold	Pro	Con	Sold	Prod	Con	Sold
Rice(muri)	787	725	62	878	796	82	11.56	9.79	32.26
Maize (pathi)	298	180	118	228	172	56	-23.49	-4.45	-52.54
Mustard (pathi)	200	182	18	229	213	16	14.5	17.03	-11.11
Pulse(pathi)	359	299	60	412	307	105	14.76	2.68	75
Potato (kg)	3073	1903	1170	4111	2011	2100	33.78	5.68	79.49
Vegetables(kg)	9300	5480	3820	12987	6437	6550	39.65	17.46	71.47

Source: Field Survey, 2019

The Table 4.15 shows that the production of vegetable, potato, pulse, have increased but that of maize has decreased. Similarly the consumption of vegetables, mustard, rice, potato, pulse have increased during the period and the consumption of maize has decreased by 4.45%. The selling of potato and vegetable have considerably increased.

4.3.1.6. Food Sufficiency

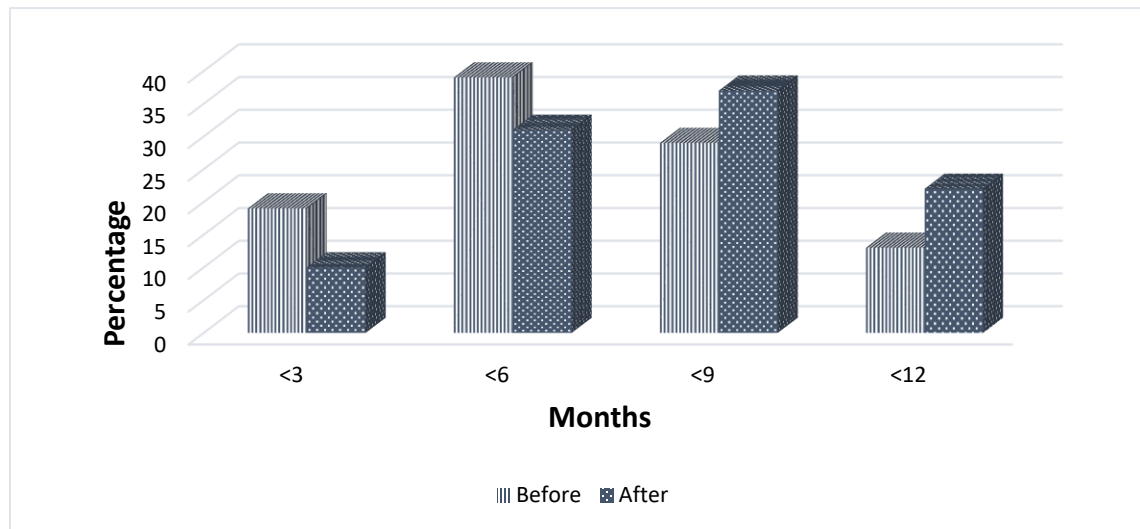
Food sufficiency refers to the availability of food production made by the given household for given time period. Generally, it depends upon the total agricultural production, size of land use under cultivation, pattern of cultivation and family size of households etc. As most of the sample households are having subsistence farming, they grow food for their own consumption. The total sampled households were categorized in to four different groups from having food sufficiency form less than three months to 9-12 months as shown in given table 4.16 and figure 4.4.

Table 4.16: Food Sufficiency of SHHs

Months	<3	3-6	6-9	9-12	Total
Before 2014	19	39	29	13	100
After 2014	10	31	37	22	100

Source: Field Survey, 2019

Figure 4.4: Food Sufficiency of SHHs



Source: Table 4.16

The table has shown that before the implementation of the project the agricultural production of the local people has lasted for few month for the consumption but after the project the agricultural production has lasted for long period. Before the programme, for only 29% of the local people the production was sufficient for 6-9 month but after the programme for 37% people the yield is sufficient for the same category. Hence the implementation of the project has positive impact on the agricultural yield.

4.3.1.7. Trend of using Agricultural Inputs after Implementation of PCTMCP

Soil quality is one of the major factors to increase agricultural production and its productivity for which use of hybrid seeds, chemical fertilizer and technology is very much common to the sample households of the study area. In the sample households have been using improve seed, chemical fertilizers like urea and potassium and the quantity of using chemical fertilizer is also increasing and using modern technology in the study area as shown in given table 4.17.

Table 4.17: Trend of using agricultural inputs by SHHs

Particulars	Response (Yes)
Seed	37
Soil Fertility	24
Technology Used	21
Total	82

Source: Field Survey, 2019

The agricultural production has increased because of the various factors. The major factors are seed, soil fertility, inputs used and the better seed used.

4.3.1.8. Livestock Keeping

Livestock keeping is an integral part of agro-economy of the study area. It becomes common practices and also considered as a part of wealth in rural society. Due to small size of land holding, lack of employment opportunities and lack of development of entrepreneurship, the rural people lack cash income. In such situation, livestock is the only reliable source of cash income. The rural people can earn money through the sale of live livestock, livestock products like milk, meat, etc. But it is found that there is decreasing of the livestock keeping.

a. Composition of Livestock's

All sample households in the study area are found keeping various types of livestock like cows, oxen, buffalo, goats, chicken, etc. Most of them are local breed. The composition of livestock keeping and its change pattern before and after among the sampled households can be shown in the given table 4.18.

Table 4.18: Composition of Livestock Keeping by SHHs and its change

Types of Livestock's	Cow	Ox	Buffalo	Goat	Chicken(local)	Chicken(boyalar)
Before 2014	43	33	28	330	317	725
After 2014	34	24	56	228	284	310
Change (%)	-20.93	-27.27	100	-30.90	-10.41	-57.24

Source: Field Survey, 2019

The table shows that the rearing of the life stock has decreased other than that of buffalo rearing.

4.3.1.9 Livestock Production and Sale

The main use of cow and buffalo are found especially for milk partly for consumption and partly for sale and manure for preparing compost fertilizer in the study areas. Moreover, goats and chicken were found to be raised for meat partly for own consumption and partly for sale. Thus, the sample households maintained livestock mainly for household needs of milk, meat and also as a supplementary source of income. The sampled households do earn monthly income through the sale of livestock products and live livestock as well. As shown in given table 4.19.

Table 4.19: Income Generation through Livestock Keeping of SHHs and its Change

Particular	Before 2014	After 2014	Change %
	Unit Sold	Unit Sold	
Milk/day(ltr)	254	162	-36.22
Goat	176	145	-17.62
Chicken	1096	678	-38.14

Source: Field Survey, 2019

The table shows that the production through the animal husbandry has reduced. After the implementation of programme milk, goat and chicken sale has been reduced by 36.22%, 17.62%, and 38.14% respectively.

4.3.1.10 Feeding Pattern of Grazing

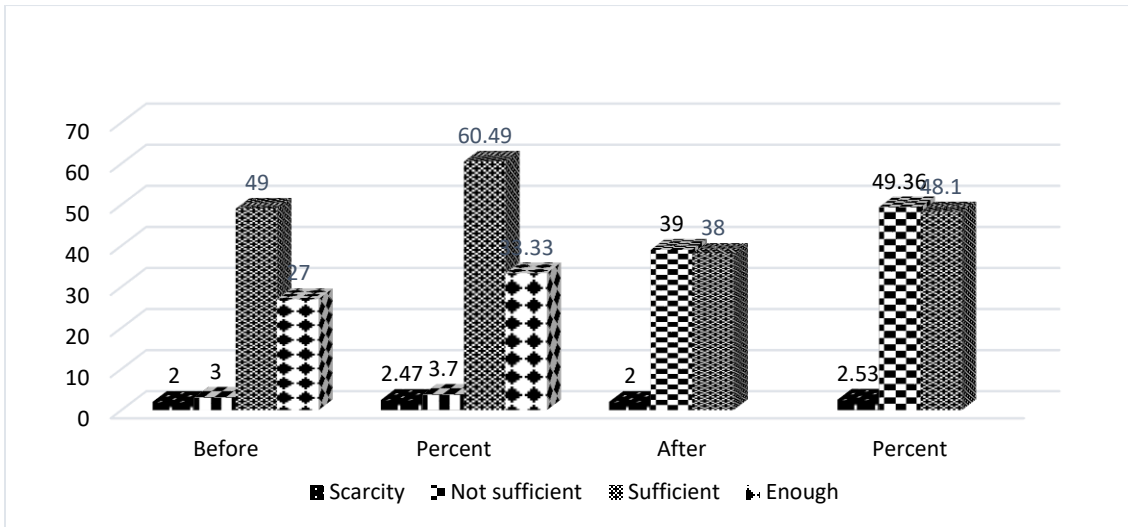
The livestock feeding pattern in the study area is very much similar to other areas of the nation like stall-feeding and grazing. Grazing is the significant for the livestock keeping in the study area where livestock keeping dependent on grazing. To know the situation of grazing availability, the following question were asked. What is the condition of grazing in the study area?

Before 2014 a) Scarcity b) Not Sufficient c) Sufficient d) Enough

After 2014 a) Scarcity b) Not Sufficient c) Sufficient d) Enough

The condition of grazing is shown in figure 4.5.

Figure 4.5: Grazing Condition of SHHs



Source: Field Survey, 2019

Due to the increasement of the forest area and stoppage for grazing, the grazing land has decreased and hence the people are facing much more difficulty in rearing the animals.. Grazing is strictly prohibited by the PCTMCP Previously 60.49% of the people have revealed that the grazing land is sufficient for them but after the project only for the 48.10% people have the sufficiency for the grazing.

4.3.1.11 Leaf Fodder and Grasses Availability

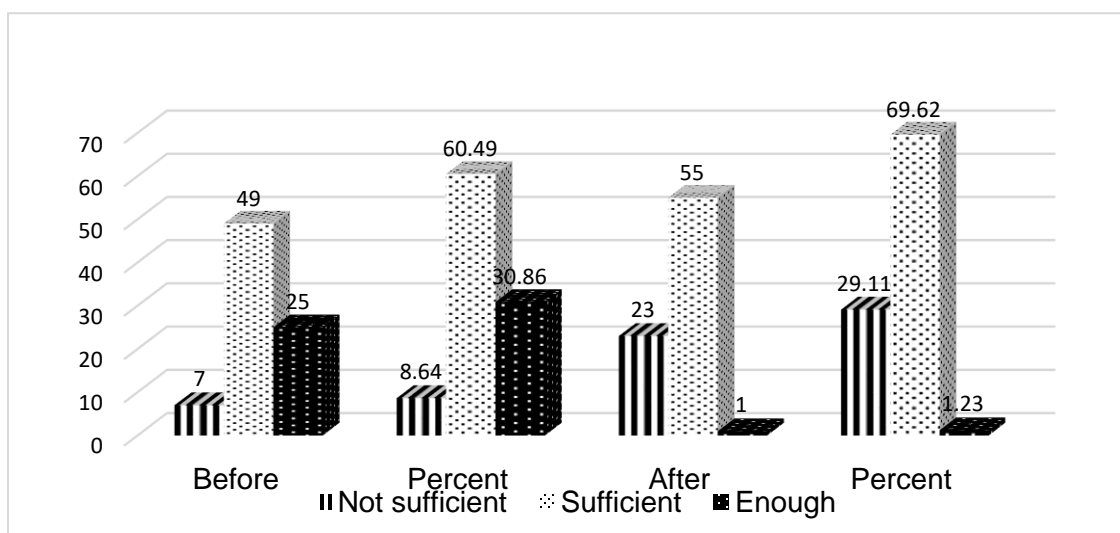
Livestock keeping is an integral part of rural society. As all the sample households keep livestock like cows, buffaloes, goats, etc., they required a lot of leaf fodder and grasses. In the study area, the collection and use of leaf fodder and grass from the forests vary from the size of land holding and number of livestock keeping. Some households highly depend upon community forests for leaf fodder and grasses due to having high number of livestock but less size of land holding and vice versa. To know the situation of grazing availability in the study area, the following question were asked. What is the availability of leaf fodder and grasses in the study area?

Before 2014 a) Scarcity b) Not Sufficient c) Sufficient d) Enough

After 2014 a) Scarcity b) Not Sufficient c) Sufficient d) Enough

The condition of leaf fodder grass has shown in given 4.6 figure.

Figure 4.6: Availability of Fodder Leaf Grasses of the SHHs



Source: Field Survey, 2019

The figure 4.6 shows that due to the increasement of the growth of forest there is increase in the leaf fodder grass for the animal husbandry. Only 60.49% people responded for the sufficiency for the fodder before the programme but after the implementation of the programme the percentage has increased to 69.62%.

4.3.1.12 Employment in Agriculture and Livestock Keeping

The Nepalese society considers the agricultural sector as the occupation of dirt and of non-prestige. The society has gradually shifted towards other occupation. In the survey area also the population of the person working in agriculture has reduced which presented in the table 4.20.

Table 4.20: Employment in Agriculture and Livestock Keeping of SHHs

	Male	Female	Total
Before 2014	124	97	221
After 2014	57	129	186

Source: Field Survey, 2019

The number of people engaged in the agriculture has reduced in totality. But the number of female population has been increased but that of male has reduced. The causes for the decreased in the male population might be due to overseas employment and attraction in others sectors job.

4.3.1.13 Income Generation through Other Sources

A part from the income sources of agricultural, livestock keeping, there are also some off-farm economic activities for income generation that comprises of service, business, and labour etc. It has also been a good support for livelihood for many sample households of the study area as shown in given table 4.21.

Table 4.21: Income Generation through Other Sources of SHHs (Rs in Lakh)

Sources of Income	Before 2014			After 2014		
	<6	6-12	>12	<6	6-12	>12
Business	6	1	-	3	8	1
Gov Service	2	-	-	2	-	-
Private Service	14	-	0	12	4	-
Labour	14	-	-	12	7	-
Pension	5	2	-	7	3	-
Remittance	6	16	1	3	19	7

Source: Field Survey, 2019

The table shows that the annual income of the household has increased at present and the major contributor is remittance.

4.3.1.14 Employment Generation in the Study Area

In the country like Nepal where the unemployment is deep rooted, the programme target some employment generation in some direct and indirect ways. The PCTMCP has also provided some employment opportunity to the households. The secondary data collected has shown such data. The project has provided the benefits to 3690 households where Dalits were 535, Janajati 1831 and others 1426 and employment generated were 7519 man days in FY 2014/15 DSCO, Rupandehi. The total benefitted HHs was 2617 comprising of 516 Dalit and 1116 Janajati. It had generated the employment of 5387 man day's employment (FY 2016/17 DSCO, Rupandehi). The benefitted HHs is 2292 comprising of Dalit 431 and 909 Janajati. The employment generated number was 3566 man days (FY 2017/18 DSCO, Rupandehi).

4.3.2 Social Impact

Social impacts means how the people are affected by the programme in the regular day life. The PCTMCP has affected the people socially by proper management of drainage system, construction of toilet and by making availability of drinking water.

4.3.2.1 Ownership of House

Majority of the people prefer to have self-owned house in our society. In the SHHs the table 4.22 also the number of people owing their own houses have increased.

Table.4.22 Ownership of House

Ownership of House	Self	Rented	Total
Before 2014	85	15	100
After 2014	95	5	100

Source: Field Survey, 2019

Previously 85% of the people had got the self-owned house but at present 95% has got the self-owned house. Hence the percentage of the self-owned house has increased.

4.3.2.2 Types of House

The society have gradually shifted towards the modernization which can be seen through the Table 4.23 construction of the concrete house from the wooden, mud and stone made houses of the earlier period.

Table.4.23 Types of House of SHHs

Types of House	Hut	Mud and Stone	Wooden	Concrete	Total
Before 2014	16	20	37	27	100
After 2014	7	13	22	62	100

Source: Field Survey, 2019

The study shows that the percentage of the concrete house has increased drastically from 27%- 62%. It could be said that life standard of the people has increased in the greater ratio.

4.3.2.3 Timber

Timber is demanded by rural people for cooking, constructing or repairing their houses and shed, fencing and furniture, making agricultural tools (plough) etc. The mature trees in the government forests will be cut only under the supervision and direction of the DoF. The State has made a special provision to provide timber to the rural people at concessional

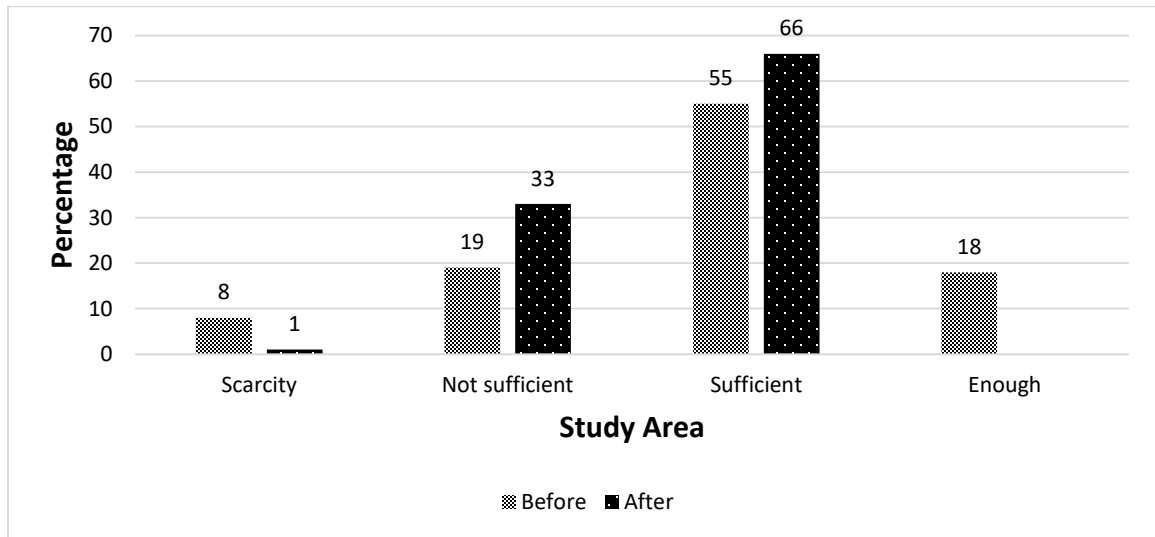
price. The timber allocation is made to a given household at a given interval of time. The main species of tree from which the sampled households obtained timber are *Sal*, *Tik*, and *Sissio*, *Khayar*, etc. To know the availability of timber in the study area, the following question were asked. What is the condition of grazing in the study area?

Before 2014 a) Scarcity b) Not Sufficient c) Sufficient d) Enough

After 2014 a) Scarcity b) Not Sufficient c) Sufficient d) Enough

The given figure 4.7 shows the availability of the timber of study area.

Figure 4.7: Availability of Timber of SHHs



Source: Field Survey, 2019

Most of the houses previously made were of wooden which demands more and more timber but the concrete houses has demanded less timber and hence they feel that the availability of the timber is sufficient. Similarly the community forest have made the availability of the timber in sufficient quantity and some level of by the programme.

The **Hot Spot** region is formed for the conservation of the trees and for making easy availability of the timber. Which is formed in 6 and 7 wards of municipality (Picture: 5). It is started from 2014/15 financial year and covers the area of 25 hector where the department of forest, Bhairahava has provided the different species trees free of cost, where, soil conservation department provided Rs 50000.

4.3.2.4 Drinking water

Water is life for every living creature. It can be obtained through different source. Those found in the survey area are listed table 4.24.

Table 4.24: Sources of Drinking Water of SHHs

Sources	Tap	Well	Boring	River	Chapakal	Total
Before 2014	20	46	2	23	9	100
After 2014	80	4	2	2	12	100

Source: Field Survey, 2019

The most of the people are using tap water at present which carries 80%. Previously the most used sources of water were well and river. People are using safe source of water at present.

4.3.2.5. Water Availability

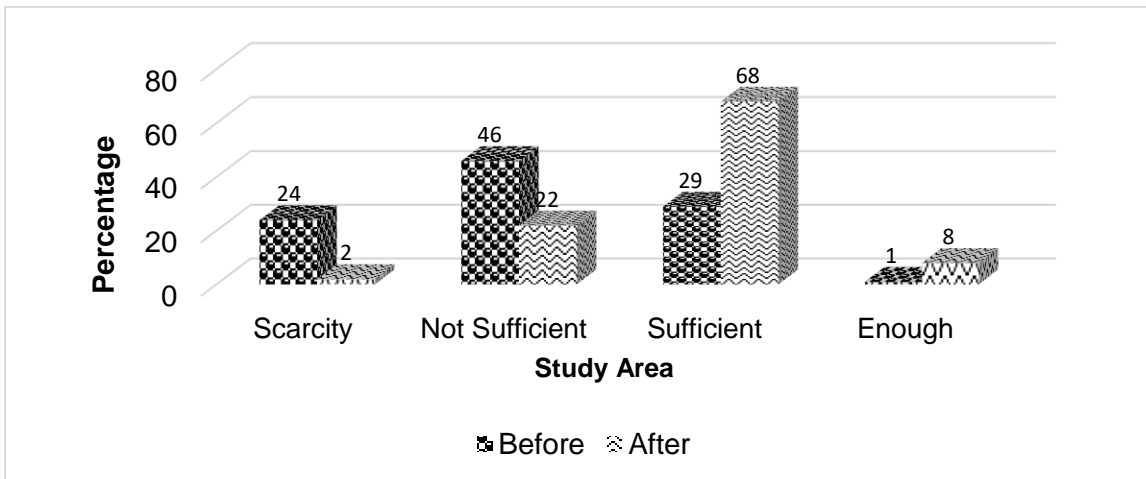
Though the country itself is rich in water resources, it is facing the problem of drinking water. To know the situation of water availability in the study area, the following question were asked. What is the condition of grazing in the study area?

Before 2014 a) Scarcity b) Not Sufficient c) Sufficient d) Enough

After 2014 a) Scarcity b) Not Sufficient c) Sufficient d) Enough

In the study area is changing availability of water to the sufficiency level from the scarcity level which is given figure 4.8.

Figure 4.8: Availability of Water of SHHs



Source: Field Survey, 2019

The availability of the water is better at present. The people have obtained better availability of the water, due to the local people, local government and some level by the programme. It shows that there is not more problem of water at present.

4.3.2.6. Distance of Water Sources

Generally, the sources of water are not easily accessible to the people. The study area has gradually shifting from problematic situation to the availability of sources near to house. The details are listed in table 4.25.

Table 4.25: Distance of Water Sources of SHHs

Distance	At home	Less than five min	½ hr	1 hr	Total
Before 2014	23	48	15	14	100
After 2014	89	8	3		100

Source: Field Survey, 2019

The sources of water are very near at present. Before the programme the people have to spend more time in collecting the water but the availability of the water at home has changed from 23% to 89%.

4.3.2.7 Cooking

In the primitive age people were fully dependent in the firewood for cooking. But at the present age they have changed towards the different sources of cooking found in the area of study also shown in table 4.26.

Table 4.26: Sources of Cooking of SHHs

Sources	Firewood	Bio-Gas	LP-Gas	Electricity
Before 2014	92	2	6	
After 2014	49	4	67	18

Source: Field Survey, 2019

Most of the households at present have used LPG for fueling the home. Previously the main source was firewood. It has contributed towards the preservation of forest.

4.3.2.8 Lightening

The modernization is also seen in the sources of lightening. The more and more advanced sources of lightening are being used like electricity, inverter, solar etc. are shown in table 4.27.

Table 4.27: Sources of Lightening of SHHs

Sources	Hydro-electricity	Kerosene	Candle	Bio-Gas	Invertor	Solar	Total
Before	67	26	5	2			100
After	92				3	5	100

Source: Field Survey, 2019

At present the source of lightening is electricity which is 92%.The use of kerosene has reduced to nil.

4.3.3.9 Toilet

It is said that the toilet shows the civilization of the society. The society has gradually shifted from primitive age of open toileting to modern attached toilet. The table 4.28 shows the figures related to the toilet.

Table 4.28: Types of Toilet of SHHs

Types of toilet	Open	Pitch	Moderate	Attached	Total
Before 2014	19	34	44	3	100
After 2014		9	81	10	100

Source: Field Survey, 2019

The number of the toilet within the compound (moderate) has increased during the period. Previously 44% of the toilets were moderate but at present it has increased to 81%. It shows that more and more people are civilized. The problem of open toileting has come to nil.

4.3.2.10 Drainage

The proper and the planned system of drainage is being seen at the present time in the city and the urban area. But the study area table 4.29 has revealed the following details.

Table 4.29: System of Drainage of SHHs

Drainage	No Drainage	Traditional Drainage	Modern Drainage	Total
Before 2014	92	6	2	100
After 2014	44	40	16	100

Source: Field Survey, 2019

The Table 4.29 shows that before there was no drainage system but at present too there is no modern system of drainage. But the traditional system of drainage has enriched to the home of the people.

4.3.2.11 Waste Dispose

The waste disposal is the major problem in the present day time due the growing population. The study area has also used different methods of the disposal of the waste. The flowing table 4.30 and (Picture: 6) shows the scenario of the area that has been studied.

Table 4.30: Location of Waste Disposal of SHHs

Waste dispose	Open place	Designated place near to house	Designated place far from house	Jalaune	Total
Before 2014	54	15	17	14	100
After 2014	19	34	39	8	100

Source: Field Survey, 2019

There was no proper system of disposal of wastage. At present the waste mostly (39%) is disposed at designated place far from the house.

4.3.2.12 River Products

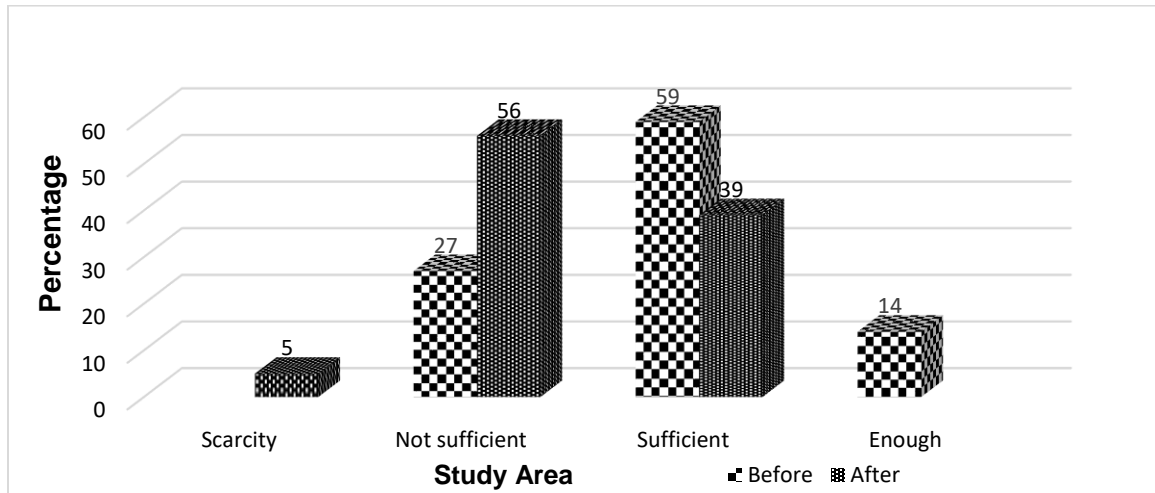
The river is the source of different materials like sand, stone, fish, etc. which are the sources of revenue generation to the government and hence controlled by it. Though the respondents have responded that the availability of the products are not sufficient, the (picture: 7) shows the larger amount of the products deposited on the bank of river. To know the availability of river products in the study area, the following question were asked. What is the availability of river products in the study area?

Before 2014 a) Scarcity b) Not Sufficient c) Sufficient d) Enough

After 2014 a) Scarcity b) Not Sufficient c) Sufficient d) Enough

The people of the study area has responded the following details about the availability of the river products, which is shown in the given figure 4.9.

Figure 4.9: Availability of River Products of SHHs



Source: Field Survey, 2019

The figure 4.9 shows that previously there was not much control in the river products and hence the people do not face the scarcity of the products but due to the control in them they have responded that the products are not sufficient to them.

4.3.2.13. The Distribution of River Products

Government controls the river products and those products should be distributed proportionately. But the scenario is different as listed in table 4.31.

Table 4.31: Distribution of River Products of SHHs (%)

Fair	Moderate	Sometimes biased	Highly biased	Total
22	44	30	4	100

Source: Field Survey, 2019

The distribution of the river products are moderate mostly. Some of respondents are not so much satisfied. 30% of them have answered that the products distribution is biased.

4.3.3 Environment Impact

Environment is all surroundings (physical, chemical, biological, social factor etc.) of human life on earth like air, water, solar, soil (land), forests, pasture land, minerals, plants, animals, birds, fish, insects, even human population in which people live and work together by affecting to each other which ultimately determines the existence, growth, development and survival of all organism. On one hand, human activities affect the environment whereas

one the other environment ultimately determined the quality and survival of life. Human beings are both agents and victims of environmental change. Since the study concerns about the PCTMCP and its management and effects of this on different aspects can be taken as given below.

4.3.3.1 Man Made Problems

The man is the problem creator to the nature. They conduct different activities which directly and indirectly hampers the environment. The problems in the area found are listed in table 4.32.

Table 4.32: Manmade Problems of SHHs (%)

Forest fire	Forest encroachment	Illegal tree cutting	Unscientific harvesting of forest product	Unmanaged extraction of river materials	Total
12	27	21	18	22	100

Source: Field Survey, 2019

Among the manmade problems, forest encroachment is the main problem. And the other are unmanaged extraction of river materials and illegal tree cutting.

4.3.3.2 Natural Problems

Some other major natural sources of problems are listed in table 4.33.

Table 4.33: Natural Problems of SHHs (%)

Soil erosion	Land slides	Flood	Lack of bio-diversity	Less growth of species	Total
21	24	27	15	13	100

Source: Field Survey, 2019

Through the study it is found that the most of the problems caused in that area is flood carrying 27%.

In the study area it was found that **River Dam** was made by PCTMCP. Its construction is started from 2014 in Buddhanagar ward n-9 (Picture: 8), to reduce the problem of flood of Ghodaha River. The cost of the programme beared by the Chure till 2017 is Rs 34 lakhs. In 2018, the contruction of 69 meter is under way. The programe has generated 900 mandays employment till now. It has also attracted the people for recreation and

refreshment by planting Bamboo and Tik around the dam which is considered as the tourist spot. According to Shasidhar Dakal (Chairperson of Ghodaha dam river system), *“The programme has benefited to our society and if obtained better co-ordination he is committed to do much more”*.

4.3.3.3. Authority that undertakes River management activities

The management of river activities are to given proper care of. The different sectors are involved in the management of the river products. The study has found then following details given in table 4.34.

Table 4.34: Authority that undertakes River management activities (%)

Working plan of PCTMCP	Decision of local government	Decision od few influenced person	Total
40	31	29	100

Source: Field Survey, 2019

According to the information collected, the river management activities are undertaken mostly (40%) through the working plan of PCTMCP. 31% of the works of the river management are performed through the decision of the local management.

4.3.3.4 Level of Satisfaction Perceived through activities of PCTMCP

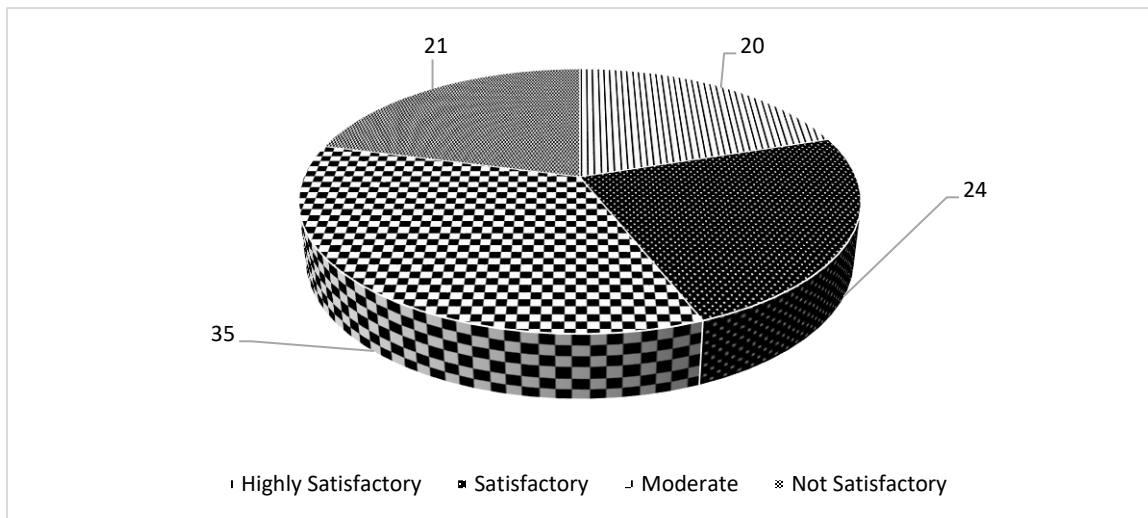
The work performed is being evaluated at last. Similarly the performance of the PCTMCP is being evaluated by the local people of the study area. The table 4.35 and figure 4.10 shows their rating towards the work of PCTMCP.

Table 4.35: Level of satisfaction perceived through activities of PCTMCP (SHHs) (%)

Highly Satisfactory	Satisfactory	Moderate	Not Satisfactory	Total
20	24	35	21	100

Source: Field Survey, 2019

Figure 4.10: Level of Satisfaction through the activities of PCTMCP



Source: Table 4.35

According to the table provided, the activities undertaken by the PCTMCP are not so much satisfactory. Only 20% of the people are highly satisfied through the project.

4.3.3.5 Changing trend in related matter since PCTMCP Implemented

To know about the people's perception towards the programme 17 different qualitative questions related to different areas were asked. The Table 4.36 shows how the system of agriculture has changed due to the programmes initiated by the PCTMCP.

Table: 4.36 Effects of PCTMCP in Agriculture, Forest, River of SHHs

Effects	Highly decrease	Slightly decrease	Constant	Slightly increased	Highly increased	Total
Crop production	7	18	25	44	6	100
Animal husbandry	47	23	25	5		100
Area of pasture	36	64				100
Forest converted into land		12	81	7		100
Area of forest				63	37	100
Growth of forest				86	14	100
Forestation				81	19	100
Trees species		5	11	77	7	100
Desertification	26	40	20	14		100
Illegal tree falling	15	55	30			100
Forest fire	65	32	3			100
Flood	29	66	5			100
Soil erosion	22	70	8			100
Gully land slides	26	63	11	7		100
River product management		22	37	41		100
Water management		17	20	63		100
Water level in river		18	37	45		100

Source: Field Survey, 2019

The table shows that average changes of agriculture, forest, river and related matter since the implementation of PCTMCP. It shows that the crop production, area of forest, growth of forest, forestation, tree species, river product management, water management, and water level in river have slightly increased. Similarly, area of pasture, desertification, illegal tree falling, flood, soil erosion, and gully landslides have slightly decrease. And, animal husbandry, and forest fire have highly decrease.

4.3.4 Participation of Local People in the Programme

For the successful of the any programme, participation of the community and the local people is very important because every programme is targeted directly and indirectly to the people. Participation means the involvement of the local people towards doing some works. In the PCTMCP has also the participation of the local people and the women seen.

4.3.4.1 Women Participation

More than 50% of the Nepalese sky is covered by female. Hence for the successful completion of any programme the invironment of the female is very important. In the PCTMCP has also, the women participation has been given major importance. The group like Amma Samuha, Buhari Samuha, and other social and economic group were made for doing the common programme. The female in the study area has also got opportunity of employment due to the PCTMCP. In the study area, women group has run the farm of animals and other agricultural products which has helped in the generation of income to them. The (Picture: 9) shows the farm run by the female.

4.3.4.2 Social Activities which are conducted by PCTMCP in the Study Area

The social works performed by the PCTMCP is public awareness programme. The programme has made different boards to aware the public by writing different slogan related to Chure (Picture: 10).

4.4 Problems, Challenges and Prospects of PCTMCP

Every work has got different prospect and the problems. While performing the good thing different problems try to stop its path. But the high level of determination clears the way and move ahead. While performing the study too different problems were faced but moved ahead to reach the prospects.

4.4.1. Problems and Challenges

For the proper accomplishment of any act, there are arise many threats, challenges and problems. They are the guiding principles to reach the summit of success. The study also has got many problems and challenges which were obtained from the respondents of group discussion. They are listed below:-

- Damage of agricultural products by Boar.

- Problems created by forest bugs while going to forest.
- The grazing area for the animals of the local people is being shortage.
- Trafficking of timber for easy earning of money.
- Involvement of the so called forest mafia in different forest activities.
- Illegal cut down of forest products for fodder, firewood, etc. by local people.
- The tender are being awarded to those who are close to the programme officials and to the so called don.
- Hecters of land is being destroyed by fire through different means.
- No priority is given towards the construction of the river dam which has destroyed the larger portion of land and creates risk to the human life.
- The materials used for the construction of dam are lacking.
- Lack of proper co-ordination among the neighboring community.
- No proper planning and implementation according to objective.
- The programme has taken up the small projects which could not able to cover the large area.
- The main problem is seen towards the sufficiency of budget allocated to the programme.

Similarly, according to Member Secretary of PCTMCB Dr. Pem Narayan Kandel the problems of PCTMCP are:

- All the budget is concentrated in lower stream and there is the budget constraint in upper stream.
- The laws and regulations for the monitoring and regulation matters are lacking.
- Lack of proper co-ordination among different institutions of the government which are given responsibility for the programme.
- There is the lack of Chure conservation and management Act.
- The people involved in the implementation do not give equal priority for the implementation.
- Chure programme through itself being long term programme, the investment is done in short term activities which has no long term effect.

- The haphazard extraction of the river products, has created a greater problem in Chure Programme.
- The participation of the local people related to community forest is lacking which has also created problems towards conservation.
- The increase of river level has created the problems of flood and the fertile land has converted into depositor of sand.
- In the name of development, different man created activities like settlement area expansion, haphazard use of cranes, use of the land as grazing area, has created greater problems.

4.4.2 Prospects

Through the group discussion and observation, it was found many short term and long term benefits and prospects that can be obtained through the programme, if the programme is run in proper way .some can be listed as below:

- Proportionate benefit of the river and forest products to the local
- Revenue collection to the government
- Conservation of the wild species and forest area
- Healthy and prosperous environment
- Emphasis on biodiversity conservation and tourism development

Similarly, according to Member Secretary of PCTMCB Pem Narayan Kandel “Prospects of Churia are not completely bleak. Prospects are out there. Churia issues are drawing increased attentions from policy makers and planners, at the same time, is gradually being incorporated into the rights movement at national and regional level. On top of that, people in the Churia regions are organizing, raising the issues in different forms and in forums. These are the indicators that simply talking about Churia conservation by overlooking the issues of livelihood of the people and the landownership issues is not going to work. At the same time, it is worth noting that about 60 percent of the population of the country lives in the 37 districts that are cross cut by the Churia range. Therefore, conservation of Churia is directly connected with the life and livelihood of the majority of the population of the country, implying the wider concerns. This is, probably the greatest opportunity for the prospects of Churia conservation.”

CHAPTER - V

MAJOR FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Major Findings

Chure region accounts for 12.78 percent of the total land area of Nepal and accommodates about 60 per cent of the total population. Chure region is little known but crucial example of a watershed and bio-diversity that provides vital in socio-economic and ecosystem goods and services supporting upland livelihoods and downstream populations in the Terai.

PCTMCP is actively working in 37 Chure victimized districts as per the required of those districts by conducting different plans, rules and regulations for the control of flood and landslide, forest management programmes and the likes. By these activities, the social, economic and the environmental development is seen directly.

There have been many studies related to Chure. The major studies that can be noted are studies related to community forest, socio-economic aspects of Chure problems to the local people, etc. But the study is focused on the financial statement on Chure and its socio-economic impacts of Devadaha Municipality of Rupandehi district. The major findings in the study are listed as:

- Through the study, it is known about the total investment during the study period, budget allocation to different department of government in the sectors of soil, forest, animal husbandry, agriculture, etc. The budget expenditure is more than 90% of the allocated budget. In Rupandehi district, PCTMCP has allocated its budget through forest and soil conservation department.
- The study has found that Agricultural land has decreased during the period. During that period irrigated land has decreased from 57.39% to 50.91% of the total productive land but on an average condition of irrigation availability has increased. Previously canal, river, tube well were the main source of irrigation but at present ponds and tube well are the main sources. PCTMCP programme has positive impact

on the irrigation facility which have been replied by the 25% HHs. It is due to the some short of construction of recharge pond and dam programme.

- Agricultural production and sale has increased during the period where as the production of maize has decreased. Food security has increased. Previously the food lasted only 42 HHs whereas at present it has lasted for 59 HHs above from 6 months. Therefore the programme has positive impact on agricultural production, due to the some short of irrigation availability and used of agricultural inputs.
- Animal husbandry has decreased. Due to the attraction in other sectors of income. Grazing condition has also decreased. Similarly, the animal rearing has been decreased due to the reduction in availability of grazing area. Whereas that of leaf fodder grass availability has increased, due to the scientific management by community forest and some extent of programme.
- The number of male working on agriculture and animal husbandry has decreased in comparison to that of female where female number is 129 and that of male is 57 only. The attraction to the business and private sector has increased in comparison to agriculture and source of income has increased.
- The social analysis of the area has found that the major sources of drinking water previously were well, river whereas at present it is tap which is used by 80% HHs and the condition of the water availability is sufficient (29% to 68%) which has saved the time of people (23% to 89% HHs). Similarly, the sufficient of the water availability has also increased. The local people participation has vital role in water sufficient and some extent by the activities of programme.
- The timber availability has increased from 55% to 66%. Previously, the illegal trafficking of timber and other forest products was prevailing. But at present, due to community forest and the scientific management system implemented by the programme of those the forest products has made sufficient.
- The river products availability has decreased from 59% to 39%. Ghodaha river being the major focus area of PCTMCP, it has greater inspection towards river products and the people has faced the problem of insufficiency of those products.
- The local people have replied that among the manmade problems forest encroachment (27%) and unmanaged extraction of river products (22%) were major

problems and among natural problems flood has been the major problems were replied by 27% HHs. Positive signs have been seen towards forest conservation.

5.2 Conclusion

Covering about 12.78 percent of the total land area of Nepal, Chure is socio-economically very significant and environmentally vulnerable, fragile and sensitive. Recognizing this, the government has formulated a high level of board called ‘President Cure-Terai Madesh Conservation Board’ to oversee the conservation activities in this region. Based on this trend and composition of financial statement and socio-economic study of programme has been conducted.

PCTMCP has direct and indirect impacts on social and economic aspects of the people surrounding the study area. The irrigation of the land has been increased off after the laundering of the programme through the pond initiated by it. The agricultural production and employment facility have been increased through the programme. The rearing of the animals has been reducing during the period. The reason for this might be the reduction in the grazing area which is due to the conservation programme initiated by PCTMCP. The availability of water for household use facilitated by the programme. The sources of water are made available near the houses. For the cooking purpose also, the availability of timber is seen in sufficient quantity. The conservation programme initiated by the Chure has made control towards the use of the river products. Overall it can be said that the programme has long term benefits through there are some social problems at present.

In nutshell, it can be said that PCTMCP activities are satisfactory. The effects of activities of PCTMCP can see at the micro level. The amount invested in the programme has not been fruitful to get the greater amount in the socio-economic status of the people. It takes long long time to see the impact of conservation. The result has not been obtained is greater mass at present. It could be hoped to obtain greater benefit at long run. Therefore, the solution of the problem is not possible through the conservation of the forest resources of the Chure region alone. Hence, watershed conservation, improvement in agriculture system, management of animal husbandry, river control, wetland management, water conservation and so on along with forest management are found to be necessary for the purpose.

5.3. Recommendations

The conservation programme initiated by the President Chure Madesh are very important. It has direct and indirect impacts towards the socio-economic aspects surrounding the area. The study has found the different problems whose recommendations are listed below:

- a) The budget should target towards the long term goals of the programme and the budget should be increased on other hand.
- b) The illegal trafficking of the forest and river products should be controlled. The people at grass root level should be inform and awarded about the programme of Chure.
- c) The activities being of small nature has small output. So the PCTMCP should targeted the greater mass.
- d) At this point of time also, the people are dependent on rainfall for irrigation. The medium and large irrigation programme should be started.
- e) The forest area has increased. The proper and scientific use of the forest products should be done to improve the economic status of the people.
- f) The scientific use of the river products should done to fulfill the demand of people.
- g) For the increase the number of domestic animals, the grazing area need to increased.
- h) Settlement area management and drainage management system related environmental friendly programmes should be implemented.
- i) The priority should be given to the Chure affected area.
- j) The proper coordination between the people and programme must be done.
- k) PCTMCP is a government program with “Proud of National Glory” and one of the ambitious program. Due to this, it is very difficult to implement the program as per the Master Plan .If implemented properly, this will surely uplift the social, economic and the environmental aspects of the society.

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