CHAPTER- I
INTRODUCTION

1.1. Background

Nepal is one of the best Country of Natural beauty and cultural heritage. Nepal has always been a source of grate attraction for mountains landscapes, lakes, green valleys, waterfalls and hillsides scattered in the form of an endless series of terraces. The entire northern border has silvery peaks of the Himalayas and the country is the home of perpetual snow. The mountain chains subdivide Nepal from north to south in to 5 Geographical Zones (Majupuria, 1999). Nepal with 1, 47,181sq.kms of territory has a population about 23 million 6,000 rivers and rivulets, 5,000 species of vascular plants, 175 species if mammals and 850 species of birds are found here. Administratively, Nepal divided in to 5 Development regions, 14 Administrative Zones, 75 Districts, 3995 Village Development Committees and 58 Municipalities (Regmi, 1999).

Water is a gift of naturally and Nepal is the second richest country of the world in the water resources. Water is very important in indispensable element for all living beings. Drinking water is the basic minimum need of all human beings. So it most be safe convenient clean and adequate whatever may be its sources. Drinking water and Sanitation facilities are the basic needs of human beings. In development of this sector will have positive important upon community and consumers is health and will produce health manpower, who used in productivity sector and different activities of the community as well as country. Safe Drinking Water will significantly control water born diseases and treatment of some normal diseases. Safe drinking supply with sanitation facilities for make the community aware of importance of sanitation form improving the public health and for the sustainable development of the community and whole of the country. Drinking water should be safe and sanitation facilities provide by the Governmental to the rural community people for to be healthy and clean environmentally.

The first piped water supply dates back to 1895AD when water piped in to same areas of Kathmandu, the system known as Birdhara. Though the planned period started from 1956. The grater stress on the started development of rural water supply was given from the fourth plan on worlds. The achievement was for less than ambitious target in both water supply and sanitation during International Water Supply and Sanitation Decade (IWSSD). In 1972 a separate agency dealing exclusively with the sector alone was realized and the department of water supply and sewerage was established. Since then it has been responsible for supplying water to the rural and urban areas of Nepal for the development of small scale water supply projects at the local level with maximum participation from the beneficiary communities the Ministry of Local Development and other NGOs INGOs are involved.

Water is a gift of Nature and is available through different sources like rain, snow, hill and ice. It appears as spring, river, ground water, sea and ocean. All living beings i.e. plants, animals and humans depends upon the availability of pre water. It is also needed both in quality and quantity for human health and environment also. History shows that the civilization development around thee abundant supply of water. So water has been playing vital role since the time immemorial.

Without water no one can be alive, water is one of the main cause of life and death of living things. However, human beings need more water to survive than other living beings. Human blood is also made of 60-70% water. To maintain the body is always required the quantity of water. Therefore water is very important to the human beings as well as for cooking, bathing, drinking and other domestic purposes. It is equally important for other development activities but first of all we need it for drinking purpose because we cannot alive without it and drinking water should be always safe, clean and sanitation facilities healthy and environmentally of the rural community. Availability of water plays of vital role in the development of a country.

Water is the largest natural resources of Nepal. It is for drinking, bathing, washing and cleaning, in agriculture, industries, hydropower generation, religious and

recreation values such a swimming, and different forms of eco-tourism. And in Nepal water is used especially surface water, lakes, ponds, ground water etc.

In developing countries 90-95% of sewages and 70% industrial wastes are dumped untreated in to surface water where they pollute the water supply. Protecting water supplies from pollutants restoring natural flow patterns to river systems managing irrigation and chemical and curbing industrial air pollution one vital steps for improving water quality and quantity.

The water available in nature may not be used directly for drinking purpose in Nepal about 70-75% of the diseases are caused by drinking water (ADB, 1986). Poor water supply, sanitation has given rise to diarrhea, dysentery, typhoid, skin diseases worms and malnutrition among children. We should not forget that ***Prevention is better than cure***. Therefore the provision of safe drinking water supply is one of the most effective measures to improve the health of the people. Considering these facts World Health Organization (WHO) has insisted all its member countries to meet the goal ***Water for All***, the year 2000AD. But is Nepal only 55% of people are getting access to safe drinking water. Drinking water is the basic need of all human beings and provision of convenient safe, clean and adequate drinking water is declared commitment of the Government of Nepal.

In recognizance with resolution of the United Nation Water Conference (UNWC) held in 1977 in Argentina, Nepal also prepared its own action plan on drinking water and sanitation. It was targeted that 67% of the total rural population would have at least one community water supply system (DWSS, 1988). In 1980 the United Nation's General Assembly declared 1981-1990 as the International Drinking Water Supply and Sanitation Decade (IDWSSD), which aimed to provide adequate, and safe drinking water proper sanitation by 1990 to all people. Though the goal of universal coverage was not attained during IDWSSD, currently Nepal also continued to reflect the aims of the decade through decentralized participatory approach.

Water resource is one of the major natural endowments of Nepal. More than 6000 rivers drain the country with considerable flow variations sediment loads including erosion and deposition. Hydropower potential is estimated at 83,000MW of which 50% is considered economically feasible. The Terai contains a reasonable amount of ground water resources for irrigation and drinking water purpose. Sporadic studies on water quality indicate the degradation of both river and drinking water supply. Drinking water in most of the rural parts also experience biological contaminated. In general drinking water quality in the urban are as is either scarce or contaminated. Like many other countries, Nepal is also facing the problem of drinking water supply. People suffering from tap water scarcity are forced to search drinking water from ponds, wells, springs and river. Water from these sources is highly polluted due to waste and other man-made activities. The use of such polluted water adversely affects the human health directly by drinking and indirectly through the irrigation of crops. In case of Nepal the human and animal wastes, sediments deposition and microorganism along with waste materials lead to waste pollution. It gives negative impact for to be healthy and environment friendly of rural community.

To provide safe drinking water and to control water born diseases various effects were made by the government as well as non-government sectors at the beginning of the planned development. Among the public participation did not get the main focus until the seventh plan. The government gave an importance to optimum mobilization of non-governmental sector and public participation only from eighth plan. But in the beginning, expected success could not be achieved and only 61% of the total population got access to drinking water at the end of this plan period. Among the 77% of the people of rural area and 56% of urban area were affected during this plan period (Ninth Plan, 1977-2002).

The role of man in changing his environment has been recognized since long age. Man is a part of environment, which is all the while being changed by man, is the course of his own development. The effects of man on the earth are geographically varied and one historically cumulative. Many changes brought by man have not been

destructive, many were unplanned and many of the results have been unanticipated and have gone undetected. In recent years, concern with the impact of man's actions upon environment is growing rapidly. Naturally the developed countries, suffering from the effects of uncontrolled industrial grown, have begun to involve themselves with environmental protection for sometime back and there environmental awareness has been conspicuously manifested in public sentiments in various forms (Rana, 1999).

Nepal's environmental challenges cover a wide range of complex issues, which are interrelated and detrimental to health. The environmental issues are water pollution due to poor sewerage and sanitation, industrial discharge and wastes; pollution growth has been one of the major causes of environmental degradation as it increases pressure on the natural resources base. Rural- Urban migration has also stretched the carrying capacity of urban utility services such a drinking water and sewerage systems. Poverty has also been are of the leading causes of environmental degradation in Nepal. Water born and air born diseases are increasing in towns and cities. Only about 30% of the total population has access to piped water and sanitation facility is access ending only 7% of the country's total population.

Drinking water is a minimum basic need of living being and human beings. In Nepal water sources are especially surface resources and specially Terai and some midland valleys uses ground water resources. In Nepal water resources status is this. Nepal has more than 6000 rivulets and rivers. Annual mean flow of major rivers is estimated to be 49.30m^3/sec. This amounts to 70% of total surface runoff. About 60-85% of surface runoff occurs during monsoon. Lakes, Ponds, and reservoirs amount to 30% of the total surface run off total available surface water potential is estimated to be 224 billion/m^3. Estimated ground water potential is 12 billion/m^3. Current ground water with draws is 0.52billionm^3/year.

Per-capita internal renewable water resource declined from 13,800m^3/year in 1984 to 10,300m^3/year is 1998. Surface and ground water quality has is deteriorated. According to a recently published. World water development report Nepal ranked 78th

in the global water quality assessment study. UN's report ranked 122 countries according to their quality of water as well as their ability and commitment to improve the situation water table has lowered substantially due to low recharge which is a result of decreasing forest coverage, increasing urban build and other non-agricultural activities. Water demand for irrigation has increased tremendously. The irrigated area expanded from 0.79 million has in 1988 to about 0.88 million has in 1998. About 90% of withdrawn water is used for irrigation. Despite having the capacity of 83,000 megawatt hydropower generation only about 600 megawatts has been generated so for i.e. 0.7% of the total potential. (H.D.Lekhak, Binod Lekhak, Page54, 55)

Fresh water sources are dwindling or becoming contaminated through our world. Globally between 50 million and 56 million gallons of water are available for human uses on an annual basis. In 1989 this amount equaled about 36 gallons per person per year and by 2000 had dropped to around 31.2 gallons per persons. In 2025 the amount of water per capita is expected to fall to 20 gallons per persons as the world's population growths from 6 billion to over 8 billion. Chronic or acute (acllte) water shortage is increasingly common in many countries with fast growing populations becoming a potential source of conflict. (Mark D. Mc Donnel)

Drinking water coverage in Nepal is 82% and sanitation coverage is 47% His majesty of Nepal has committed to the millennium development goals of halving the proportion of people without access to water and sanitation by 2015. The implications of this commitment are that a left 11,000 people need to be served with safe drinking water and 14,000 with sanitation every month for the next 10 years if the largest are to be met. This target is certainly achievable but will require a coordinated effort from all development pertness. (National Census, Central Bureau of Statistics, 2001)

By the end of the National Plan 71.6% of the total population has the access to drinking water. It is estimated that there are still 28.4% of the population deprived of drinking water facility, a basic need of life. As majority of the population is unware about the importance of environmental social and personal hygiene and sanitation, the water borne diseases are still out of control. As such epidemic of water borne diseases have been seen. So the major challenge is to develop and expand adequate drinking

water supply with sanitation facilities side by side. It is also necessary to make the community aware of importance of sanitations for improving the public health.

The water is available in nature in many ways. But the water available in nature may not be used directly for drinking purpose. In Nepal about 70-75% of the diseases are caused by drinking water (ADB, 1986). As Nepal is rich country in water but due to poor economic condition it has no good management. So even now Nepalese people are not benefited with safe drinking and sanitation except few village development committees. By the end of Ninth Five Year Plan (2054-59) 71.6% of the total population has the access to drinking water. It is estimated that there are still 28.4% of the population deprived of drinking water facility (NPC/10thplan). As such majority of the population is un ware about the importance of social and personal hygiene and sanitation. So the water borne diseases are still out of control. As such epidemic of water born diseases have been seen. The water resources, which are available in our surrounding may not be suitable or free of contamination it may be harmful, so that should be tested and treated properly. If we turn our mind to the rural sector we will get great disparities between water touchable and untouchable group, which is great problem from the social and cultural point of view. It is also a constraint of drinking water development process.

The water resources are not available near in most of the rural sector. So that rural people they have to walk about 50 to 60 minutes on average to get a gagro (water keeping pot) of water they have to depend on the deep wells. So the government thinking about such problems has started to invest the annual budget for proper to supply safe drinking water and sanitation sector. Now various INGOs, NGOs and other social institutions of local NGOs have also started to work in safe drinking water and sanitation field.

The millennium development goal passed in the summit by 147 participants countries of the world in Johannesburg, states: (i) Halve, by the year 2015, the proportion of the world's people whose income is less than $1 a day and the proportion of people who suffer from hunger and by the same date, to have the proportion of

people without access to safe drinking water. (ii) Increase access to sanitation to improve human health and reduce infant and child mortality, prioritizing safe drinking water and sanitation in sustainable development strategies and poverty reduction strategies where they exist.

Accordingly, top priority has been given by Government of Nepal to increase coverage of water supply facilities. Nepal Government aims at supplying safe and easily accessible water to all its citizens till 2017. To achieve this ambitions target Government, INGO's and other stakeholders in this sector trying to do better.

As a matter of fact, drinking water and sanitation facility are the basic needs of human beings. Development of this sector will have positive impact upon consumer's health and will produce healthy manpower, which would contribute to the growth of other productive sectors and activities of the country. Safe drinking water will significantly control water born diseases and on the other hand it sustainability minimizes healthy expenses to be incurred on treatment of such diseases. Apart from this the time saved from fetching water could be utilizes in productive works, which is turn, provide opportunity to earns more income to general public. Development of drinking water sector contributes to production of healthy manpower, additional income generations and less healthy expenditure on treatment of diseases. All these together would undoubtedly assist to achieve poverty eradication goal of the tenth plan (Page No. 497).

Drinking water is important not only for human survival but for sound public health the availability of drinking water directly and indirectly will assist the poverty alleviation in the sense that if helps to improve labor productivity which would occur from increase in average life span reduction in infant and child mortality rate and improved public health such indicators improve public health related human development index (HDI) most of the women and children have to spend substantial time of the day in collecting and in fetching water. Easy access to drinking water therefore, undoubtedly will save time, which could be utilized comfortably in other economic activities. In the case of children, the saved time will provide then more

educational opportunities. The water benefits of easy access to drinking water are. It increase women literacy and assist in promoting gender equality considering the vital role of consumers they are to be involved in the drinking water projects right from the design stage up to the implementation and operations. Also the time bound programs are to be decentralized to all district level agencies. Such decentralization will make the projects more sustainable and their operation as well as maintenance will be effective. (P.500 Tenth Plan).

Among the five districts of Rapti Zone, Rukum is one of them. There are 43 VDCs among them Shova VDC is old headquarter. Shove VDC is popular because this VDC is old headquarter of Rukum District. The soil of the VDC is fertile and main source of drinking water are Tharakhola and Sani River and other Streams. The climate is not so different from other parts of district. The climate changes according to the change in the monsoon. In this VDC are different cast and ethnic groups. Like Brahiman, Chhetri, Magar, Kami, Dami, Sarki, Sunar etc. These groups are living friendly. The main source of water of this VDC are public tap, streams, springs, wells, river etc.

1.2. Agencies Involved in the Water Supply Sector

Some national and international governmental and nongovernmental agencies are involved to deliver clean/safe drinking water and sanitation in both rural and urban areas. Some NGOs and INGOs have been playing on effective role in the drinking water and sanitation sector through the implementations of water supply projects that are usually integral integrative in nature and incorporate with a high level of community involvement. The most active providers of the services in the water and environmental sanitation (WES) sector are the department of water supply and sewerage (DWSS) local authorities (VDCs and DDCs). External Support Agencies (ESAS). Non-Originations (NGOs), Privates sector, community based organizations (CBOs and user's committee.

The National Planning Commission (NPC) is responsible for overall development plans and policies and it approves annual budget estimates. The Ministry

of Finance (MoF) is responsible for mobilizing and allocating resources. The Ministry of housing and physical planning (MHPP) is responsible for formulating the overall policies and looks after all rural water supply development and urban water supplies. The Nepal water supply corporation (NWSC) is an autonomous body responsible for water supply and sewerage. The Ministry of Local Development (MLD) is involved in providing water supply facilities through integrated rural development projects. Within the MLD, the Woman Development Division (WDD) and Remote Area Development Committee (RADC) are also providing a number of water supply and sanitation facilities. The Ministry of Health (MH) is mainly responsible for public health education through class-room lectures. The Ministry of population and environmental (MPE) is responsible for controlling population growth and implementing environment protection programmes.

Water Aid INGO, Nepal water for Health (NEWAH). It is implementing water health and environment sector projects Nepal Red Cross Society (NRCS) and NEWAH are major NGOs that are implementing water and sanitation project in Nepal. Like such other organizations UNICEF, DWSS, EU, GTZ, US-AID, FINNIDA, HELVETAS, WB, UNDP, WHO, JAICA etc.

NEWAH is an organization that works throughout rural Nepal providing clean drinking water, sanitation and health education. It is the largest National NGO established in 1992. Specializing in the rural water and sanitation sector in the country. NEWAH aims to improve the standard of living of poor people in Nepal by supporting community development initiatives. It has assisted 116 local NGOs complete 2429 community tap stands serving 151075 people with clean water 12247 domestic latrines benefiting 97976 people with safe sanitation facilities.

The government and non-governmental sector are trying to deliver safe and clean drinking water to the rural and urban peoples. They are also collaborating to crate public awareness on emerging environmental problems. Similarly, many small projects are also helping to supply the drinking water in rural area under the active participation with help of the local NGO and DDC, VDC, NEWAH lunches the

different drinking water supply, sanitation and health education project in Rukum District. The Tharakhola drinking water health and sanitation project is one of them, which is lunched by active participation of people in the development phase of project.

1.3. Statement of the Problem

Water is the basic need for living beings and it is not possible without water living beings cannot alive. Development also depends on the availability of water. Nepal is one of the poorest countries in the world but Nepal is rich with the various natural resources. Nepal is known as the second biggest country in the water resources. But it has not satisfactory utilization because of the poor economic condition and other various domestic problem such as, lack of economy, lack of technology unskilled manpower, corruption and nowadays problems of conflict. Safe drinking water and health of people is the recent phenomenon in Nepal. In urban areas environmental challenges are also main issues. This is particularly true in the case of public water supply in the areas of Rukum District.

It is estimated that about 76.6% of the population has drinking water facility in Nepal by end of Ninth Five Year Plan. Still, 29% of the population has been deprived of basic drinking water service. Present water supply coverage in Nepal is 81% while sanitation coverage is 27% (WHO, 2001). Resent census 2001 indicates that the coverage in water supply in Nepal is 69% at present. In sanitation 48% use toilet facility of which 26% have permanent toilet where as 22% have temporary pit latrines. These differences many have resulted with different definition of coverage.

Without the resources to construct and maintain water supply and sanitation facilities it is difficult to attain levels of personal, domestic and environmental hygiene conducive to health. Resource so relate not only to money, but also to the availability of land, time, achieving improved facilities so without all facilities most of the people are suffering from the water born diseases.

Culture has defined the role of men and women's al outsider and insider. Women has to work inside the name but it includes cattle care and farm work. Basically rural women are responsible for water related works. Most of their life time is spent in water related activities in the house. They do not have sufficient time for cut door works. and care about safe drinking water and sanitation women's contribution to the house holed activities is largely to manage water, prepare food, gather fire wood, child care and some generate income. Their work is not viewed from the economic perspective there is clear discrimination between men and women. This is also one of the biggest issues because of time investment in safe drinking water managing works of women in rural areas of Nepal. Due to the scattered settlement and the remoteness of the water sources people have to invest more time for fetching water. So the provision of safe adequate drinking water nears the house. Certainly save the water fetching time which can be used tin other different activities so that in the developing country especially in Nepal. In rural sector most of people are suffering lack of the safe drinking water and sanitation and also different water born diseases.

Shova VDC is less developed village in Rukum District. In Shova VDC have a lot of problems such as agriculture, education, economics, industry and basic services and affected by the conflict. Due to the lack of health education people do not understand the importance of safe drinking water. The main sources of drinking water of the study area are stream, spring, well and public tap. People are still suffering from different water born diseases because drinking water is not safe and sanitation. Also they have not knowledge about the clean environment. The study is based on safe drinking water and sanitation availability and lunched by NEWAH with local NGO Sirjanshil Yuba Samaj (SYS) in Shova VDC of Rukum District and peoples participation with view of problems and impact in the people's health and environment of safe drinking water and sanitation in Shova VDC of Rukum District. Water is recognized as one of the most important basic need of the people. Provision of safe drinking water in adequate quantities is the present requirement of the people public water supplies is in operation to meet these changing requirements of the consumers. Subsequently, the quality of drinking water has because a prominent issue for people's

health in these days. The government policies are to ensure sustainability and ownership by the user's groups, particularly in the rural areas.

1.4. Objectives of the Study

The main objectives of this study is to define the condition of Tharakhola Drinking Water Health and Sanitation Project (TDWHSP) in Shova VDC provides by NEWAH and people's health and environmental for community.

The specific objectives of this study are as follows:

i. To identify the present status of water and sanitation.

ii. To examine the impact of TDWHSP on local community households with particular reference to health and environment.

iii. To find out current problems on effective of drinking water supply.

iv. To suggest measures for improving in the supply of drinking water.

1.5. Significance of the Study

Water is recognized as one of the most important basic need of the people. Provision of safe drinking in adequate quantities is the present requirement of the people. Public water supplies are in operation to meet the changing requirements of the consumers. Subsequently, the quality of drinking water has become a prominent issue for peoples' health and environment in these days. The government policies are to ensure sustainability and ownership by the users' groups particularly in the rural areas.

The growing population and industries have made the water more polluted than before. Due to lack of education and rapid growth of population, water resources have become so polluted that they are not suitable for drinking and affecting the environment relatively. Drinking water should be, colour less, pleasant, safe, sanitation facilities in taste and free from pathogenic bacteria. But by using polluted water,

people are suffering from water born disease like diarrhea, dysentery, skin disease, malaria, yellow fever etc.

To address these issues, NEWAH has peen planning to improve the service with up grading the quality of supplied water. In this context NEWAH has emphasized to improve the safe and quality of drinking water and sanitation in Shova VDC. For the successful implementation of project the peoples' participation is important in the rural water supply and sanitation programs, similarly, environmental pressures stem from different roots poverty, lack of knowledge and the need for economic development at any cost. The general environmental problems are also addressed in the study.

Most of the studies on drinking water supply have been done on water supply and its impact on health. No agencies have carried out such study in this VDC. So the present study has focus on the safe drinking supply sanitation of TDWHSP and its impact on human health and environment, present problems suggestion etc of Shova VDC, Rukum District. The role of Nepal water for health, VDC and people's participation is also includes in this project. So the present study has its own significance in the relevance field. The impact assessment study may be an interesting area for the academicians and other social researches. Conceivably, this study may provide some concepts and visions to development workers, for the local people who are less known about safe drinking water supply and sanitation as well as policy makers who have involved in water supply and sanitation sectors in rural areas of Nepal. The study expected to be helpful in contribution to formulation of appropriate policy, procedures and approaches to rural water supply and sanitation program intervention in rural areas of Nepal. Additionally, it may also offer some practical suggestions as regards future program interventions. The study has therefore a practical ground as well. Moreover, the finding gathered will also serve as a basis for the future similar study, helpful to researchers, students and persons who interested in this sector.

1.6. Scope and Limitation of the Study

Every social science research is not beyond the limitation and if is not the exception of that. This study was conducted only at TDWSHP of Shova VDC, Rukum District. In fact, conducting good research may require large amount of resource, time, manpower and economy. Since the researcher is a student his study may not fulfill each and every requirement for good research due to the constraints of resource, time and manpower. The research is mainly based on the primary source of data. The sample size included in study was small due to budget and time constraints. Hence due to limited number of samples, caution should be taken in generalizing the findings. So theoretically the research may not be much comprehensive. So the findings of it may not be generalized in exact condition of safe drinking water and sanitation sector in the other areas of the country. Specially this study is confined to the water supply sanitation of the study area; water quality and its impact on public health and environment and role of NEWAH for develop safe drinking water supply project. This study does not cover all aspects of water utilization due to limited time and budget. This study specially focused on word No. 3, 2 and 9 of Shova VDC, Rukum.

1.7. Organization of the Study

This project report has been divided in to six chapters. The first chapter deals with introduction of the subject matter, objectives and rationale of the study. Similarly, various studies are made in the second chapter through review of the literature. The third chapter is about research methodology of the proposed study. The fourth chapter is the description of the setting or study area. The fifth chapter is related to findings their analysis and presentations. The sixth chapter focuses on conclusion and recommendations.

CHAPTER- II
REVIEW OF LITERATURE

2.1. National Perspective: An Overview

Nepal is among the poorest and less developed countries in the world with nearly half of its population living below the poverty line. Agriculture is the main stay of the economy, accounting for 38% of GDP. About 65% of the people of Nepal are served by water supply facilities where as only 33% of people have access to sanitation facilities. Water borne diseases claim about 40,000 under five year child deaths (UNICEF 1987, updated) and the country suffers an estimated loss of US $1200 millions each year. Lack of knowledge about safe drinking water and sanitation is becoming a very serious problem in Nepal. These facts show that the sanitation condition of people should be improved immediately.

In Nepal a large mass of the population is still deprived of safe, convenient and adequate drinking water and sanitation facilities. The rural population in hills and mid-hills still obtain their water from springs, ponds, canals, stream and rivers, which are in most cases, grossly contaminated. The water has to be fetched from a long distance involving heavy ups and downs and thus the quality of water used in minimum and just enough to sustain life. The condition in Terai areas too is not better despite availability of enough ground water, very often, shallow tube wells and dug wells too, are polluted. Due to faced contamination water born diseases such as cholera, diarrhea, and dysentery in fiction, hepatitis are the major causes of motility and morbidity especially among children. It is very sad to note here that the infant mortality rate in the country is a high as 107 per thousand with 44% of the infant and child mortality caused by diarrhea diseases alone without safe drinking water and sanitation facilities show the negative impact of direct human life and environment.

Safe drinking water and sanitation sector is widely studied in Nepal. The earlier studies concentrated mainly technical field and in providing the piped drinking water supply in the country. In the beginning, technical issues related with the supply of safe

drinking water in the urban areas were taken prominently to study. Later on, the issues of water supply in the rural areas were taken with the support UNICEF to improve the life of the people and environment of the rural areas. Nepal Red Cross Society was selected as the implementing agency to work in the rural areas as catalyst between the people and the donor agencies.

The general review of the documents in this section reveals that these documents are concentrated more on the holistic issues of the water supply, health and environment on Nepal. The present study has considered in study of the people's participatory project of Rukum District lunched by NEWAH. This may be definitely provided a lot of insights in the field of drinking water supply project in the rural areas of Nepal.

2.2. History of Drinking Water Supply Sector Development in Nepal

Describing the seventh century of Lichhavi King Narendra Dev (643-690) Wang Hiuen Tse, then Tibetan Ambassador remarked on the prevalent Nepali civilization.

In the center of place, there is a tower of seven storey …..At each of the four corners of the tower water is poured in to the through from the dragon's mouth it gushes out as it would from a fountain ….. . The inhabitant's areas themselves with one piece of clothe which covers the body. They bath several times daily. They venerate five celestial beings and carve their images on stone; each day they wash themselves with purifying water (Levi, 1905-8).

After about 14 centuries in the closing years of the second millennium, a 4 report prepared for International Development Association (IDA). USA paints a diametrically opposed water supply and sanitation scenario in Nepal.

Poor water supply and sanitation services continue to be critical problems in Nepal (DAN, 1994; XV)

Much water has flowed in the river of Nepal Himalayas incessantly over the centuries between the Tibetan Ambassador's account and the twentieth century IDA findings wars have been fought, dynasties and regimes have altered, boundaries have

shifted and cultures, religions and societies modified. One phenomenon however, remains unchanged, that is water continues to flow in the thousands of fountains, rivers, springs, streams and in the vast natural reservoir under the earth's surface, as it did from time immemorial.

The history of water supply development in Nepal, dates back to as early as the Lichhave days when stone spouts, commonly known Dhunge Dharas were constructed to bring water near to the settlements. Constructed in an elaborate manner, some of these Dhunge Dharas have lasted till date for centuries. The history of modern piped water supply system in Nepal dates back to the end to 19th century (1895AD) when Birdhara the first water supply project was commissioned in the capital city of Kathmandu. But the sector received fair impetus only after the First Five Year Plan started in 1951. Before 1951most water supply projects were designed to serve though public stand posts only with few exceptions. In order to meet the ever-increasing demand of water supply and need for the establishment of a separate agency was felt greatly and therefore consequently DWSS, presently MHPP was created in 1972. At present DWSS is the lead government agency in this sector with the responsibility of planning and management of water supply in 40 out of 58 municipalities and almost in all rural communities. NWSC, under MHPP is a semi-autonomous organization responsible for water supply in 15 municipalities. DDCs, VDCs Municipalities, INGOs, NGOs, RWSSFB that are mainly involves in the implementation of small rural water supply schemes.

As the commitment to the resolution of the UN to lunch IDWSS (1981-1990) i.e. safe drinking water and sanitation for all by 1990, Nepal prepared a Ten-Year plan for the provision of drinking water supply and sanitations. The pal set a decade target, which envisaged extending national water supply coverage from 12% to 68% by the end of the decade. Although the decade plan proved too ambitious and the actual coverage was only 37% by the end of the decade, however, it provided significant impetus to the development of this sector. (MHPP/IDA, 1994)

2.3. National Scenario

Safe drinking water and sanitation sector is widely studied in Nepal. The earlier studies concentrated mainly in technical field and in providing the piped water supply in the country. In the beginning technical issues related with the supply of drinking water in urban areas were taken prominently to study. Later on, the issues of water supply in rural areas were taken with the support of UNICEF to supply drinking water and sanitation and improve rural people health and environmentally of the rural areas. Nepal Red Cross Society was selected as the implementing agency to work in the rural areas as catalyst between the people and the donor agencies.

With the support of Asian Development Bank (1998) Government of Nepal has been implementing rural water supply and sanitation programs in different parts of the country for last one and half decade. This has really increased the coverage of safe drinking water and sanitation and improves people of life and environment of the rural areas. In such studies the socio-economic components, such as ethnicity, income level affordability and cost sharing have been considered in the selection of the schemes. On top of these factors the community participation was taken of the important requirement for the initiation of the rural safe drinking water and sanitation and improve life and environment of the rural peoples.

Gautam (2002) has found about water supply and health that water should be easily accessible adequate in quality safe and readily available throughout the year. There can be no state of positive health and well being without adequate and safe drinking water. Good health is the result of a dynamic relationship between man his environment along with interaction among physical, social, economic and cultural environmental pollution and its effect on health are prime necessity.

Erica Loren Zen has found in his research "Drinking Water, Sanitation and Health Education in Rural Nepal" that though Nepal is a country rich in fresh water resources, currently in rural Nepal only 34% of the population has access to safe water and only 3% to sanitary facilities. The implications of the people of Nepal are that incidence rates of infections diseases are high as a result of poor health care infrastructure. The problem of water is one of the both quality and quantity. Improving

public health through water and sanitation requires attention in water quality, water quantity and accessibility hygiene education and sanitation facilities.

Roark (1980) on his report "Rural Water supply and Community Participation in Nepal highlighted community participation in the rural water supply and explained the mechanism of its functions. He has also stressed the women's participation for success of rural water supply projects. The study is related with rural water supply and focused the role of women."

The Government of Nepal has increased its activities in the water and sanitation sector considerably during the drinking water sanitation decade (1987-89). The Government announced various water supply and sanitation measures under the basic needs programs initiated in 1987. The community water and sanitation project was implemented initiated under the Ministry of Local Development/Lesson from the last decade. Sector Review, Nepal State of Sanitation Report 1991-2000, P2).

A book entitled "Population Environment Change" published by UNFPA (2002) has found that as population grows and demand increases, the search for water, food and energy resources and resulting impact on the environment are calling sustainability into questions. The supply fresh water is essentially fixed and the balance between humanity's demands and available quantity is already precarious. Environmental condition help determine whether people are healthy or not and how long they live. There is a close relationship between the environment and reproductive heath.

In 1991 (DWSS) Nepal published the drinking water and sanitation sector review report which assessed and evaluated experience, its conclusion were (i) the need for integrated programs of drinking water and sanitation (ii) mobilization of greater community participation (iii) sanitation and hygiene education current state of sanitation in 1996/97 (Rural areas 17.5% Urban areas 61.4%).

The main rationale for improving sanitation is to have better impact on the health sanitation. The main health indicators have shown improvements in health

condition in recent years. Various factors such as immunization increased household concern for sanitation and willingness for spending on health care, as well as provision of safe drinking water and sanitation facilities have accounted for this. The major health benefit of improved sanitation is obvious in the control of diarrhea especially among children.

Sanitation is poor in most of the public places, offices, and hotels, around religious places along the tourist routes, streets etc. General negligence on the part of people and lack of strict control on sanitary standards to be maintained in hotels and public places are responsible for these conditions. Water shortage also hampers practice of good sanitation (HMG/N Ministry of Water Resource: (1981-90) water is the key to Nepal's Development).

Mid-term evolution of drinking water and sanitation program (1990) published be center for research on environment, health and population activates have evaluated the program conducted by Nepal/Japan Red Cross Society. The main objective of the evolution is to access the impact of drinking water and sanitation program on the community on the project areas of the Terai and hill districts. Impacts of the program have been studied in terms of sanitary behavioral changes among the community members.

DWSS as the lead agency in the water and sanitation sector, with districts and regional level offices, executes several donors supported projects. The various program lunched by Ministry of Health directly plays positive role to control diarrhea diseases are closely related to sanitation, contents in secondary level course and environment education at the primary level School course. The Ministry of Local Development providing grants to VDC widely used for drinking water works and executes the FINNIDA supported rural supply and sanitation project (HMG, 1997, approach to Ninth Five year Plan 1997-2002)

In the study of (Park 1997) discusses that much of the ill health in the underdeveloped country is largely due to lack of safe drinking water. There can be

state of positive community health and well being without safe drinking water supply and sanitation. Investment in water and sanitation sector schemes considerably will play huge dividedness in improved health of people. This fact has been practically proved in many studies related to the drinking water and sanitation.

The World Bank (1993) has published an issue paper related to safe drinking water supply and sanitation. In this paper, several issues have been discussed with various experiments. According to this paper, the first priority should be given to the availability of safe drinking water and sanitation facilities and control on the contagious water born diseases to the people of rural areas. This paper has also focused the pricing criteria and it has stated that tariffs on the marginal consumption should reflect average incremental cost.

Likewise, Biswas (1993) has found the warning situation of the world with the down of the twenty first century in his research "Water for Sustainable Development in the Twenty first Century; "Water crisis a Global Perspective". The crisis may be considered as the result of four important but interrelated phenomenal (i) The availability of fresh water will be limited on a long term basis, (ii)The demands of water will be increased to fulfill the requirements of increasing population, (iii) The increasing population will also increase the water products which will contaminate available sources of water, (iv) The increasing delays in the implementation of new water projects will affect in the coming decades.

Roark (1980) on this report "Rural Water Supply and Community Participation in Nepal" focused community participation in the rural water supply and explained the mechanism of its functions. He has also stressed the women's participation for the success of rural water supply projects. The study is related with rural water supply and focused the role of women.

NCCBS, 2001 to maximize the potential impacts of improved water supply and sanitation it is vital that improved hygiene practices are also practiced washing hands critical times, such as after defection and before eating, can do more to reduce the

spread of diseased that the access to safe water itself (National Census, Central Bureau of Statistics, 2001).

David Brown "Impact of Safe Water, Sanitation on World's Poor". Around the world, however, 1.1 billion people get their water from rivers and ponds or from springs and wells open to the air and subject to contamination. More that twice as many…. 2.5 billion people in all…use public latrines or the whole outdoors as their bathroom. Access to safe water and basic sanitation were among the "Millennium Development Goals" that 189 heads of state from around the world adopted in 2000. Specifically, they pledged that by 2015 they would reduce by at least half the proportion of people living without those two essential of civilization. The year 1990 was taken as the baseline against which progress would be measured. Teaching those goals would have profound effects on the world's poorest people…. effects for beyond better health, that most obvious one. The World Health Organization and UNICEF recently issued a report on the progress achieved as of 2002, the midpoint in that 25 years period. In 1990, 77% of the globe's population had access to indoor running water, piped public taps, protected wells and rainwater. In 2002, 83% of people had those "Improved" drinking water sources. Progress is on track to meet the target of 89% by 2015. Equally impressive is the fact that 52% of people have the best of the improvements household running water. Improved forms of sanitation include not only flush toilets, about also latrines that are used by only one household and are ventilated and designed to isolate waste from the surrounding environment. In 1990, 49% of people used such facilities. By 2002, that had increased to joint and 58%. Unless progress accelerates, that target of 75% coverage will not be met with the effort falling short by about half a billion people. Both improvement lead to better health, although how much each contributes has been hard to measure. That is be cause people's health is also affected by personal habits, methods of storing and cooking food, as well as by education and income. But clean water by itself has relatively little effect on rates of other water borne infections, such as childhood diarrhea. These illnesses are mostly transmitted by the fecal contamination of food, dishes and hands. They reflect the amount of water a household has for washing and hygiene not the quality of the water.

For that reason, bringing the source of water to the house or yare reduces that diarrhea rate by 44%, while water delivered to a public stand pipe…where someone must go with a water container… reduces that rate only by 6%. Improved sanitation cuts diarrhea incidence by a quarter to a third. Interventions that promote personal hygiene, such as hand washing, decrease it by 42% according to recent research. Traditional water born diseases, however, is not the only ones reduced by clean water and toilets. Trachoma is a bacterial infection of the eyelid responsible for about 6 million cases of blindness worldwide. Better water and sanitation reduces trachoma rates by an average of 27%. Once….a…day face washing with handful of water is one of the four chief interventions beings pushed in an international effort to eliminate trachoma. Curiously, health benefits are far down the least of reasons that people in poor countries give for wanting better water and sanitation services. Relief from the drudgery of carrying water long distances….a chore borne almost entirely by women and girls….is the chief benefit that people mention. (Washington Post Staff Writer-Monday, November 22, 2004, PageA12).

Annual reports of Nepal Water for Health (NEWAH) were reviewed to understand the organizations history activities and structure. NEWAH was established in 1992 with the vision of improving the health and quality of life of all people of Nepal by ensuring access to safe drinking water and hygienic sanitation and its impact in health and environment. NEWAH works in communities to conduct sustainable, participatory initiatives to support Nepalese people in the greatest need. NEWAH has worked in over 600 communities in 45 districts of Nepal to serve around 60,000 peoples of rural community of Nepal.

A book "Plan of Action Drinking Water and Sanitation Program" (1996) published by NRCS discuses the plan of action to enable people to breakaway from the vicious circle of poverty to a better quality of life through various strategies. The plan will work to increase maximum involvements of communities in the diagnosis of problems for planning implementation and maintained of water supply schemes and sanitation components. It will help community to obtain sufficient quality of safe drinking water for personal, domestic and environmental hygiene purposes moreover.

It will help and enable communities especially women to interlink water sanitation and health with other aspects like nutrition, food and fodder production and income generation for a better quality of life.

The long-term vision is to assure drinking water and sanitation facilities in accordance with the Twenty-Year drinking water service perspective plan. The drinking water service will be categorized into three different levels, viz, high, medium and basic employing indicators like water quality, quantity access, supply period as well as reliability. As high as 25% of population will provided high level service and medium level service to 60%, while basic level service will be made available to 15% population. In urban areas, treated drinking water supply will be made available along with the service of sewerage system and solid waste management. In rural areas drinking water facility will provided with appropriate system domestic toilet and sanitation service.

The quantitative targets set by the Tenth Plan as to period drinking water service to additional 4.591 million people including 3.852 million rural and 0.739 million urban populations with the plan period. It also targets to provide high-level service to 1.334 million people and medium level service to 2.668 million people by up-grading the drinking water supply system. Likewise sanitation facility will be provided by 7.421 million people including 5.613 million from rural and 1.8.8 million from urban areas motivating the households to construct private toilets. Public awareness of personal hygiene and sanitation will be increased through mass publicity and training programs with in the Tenth Plan Period. (NPC, Tenth Plan)

In 1991 DWSS Nepal published the safe drinking water and sanitation sector review report which assessed and evaluated the experience, its conclusion were (i) the need for integrated programs of drinking water and sanitation (ii) mobilization of greater community participation (iii) sanitation and hygiene education current state of sanitation in 1996/97. (Rural areas 17.5% and urban areas 61.4%)

The term sanitation (DWSS, 1994) gives a broad interpretation of sanitation. Sanitation has been defined in that statement as activities, which improve and sanitation hygiene in order to raise the quality of life of an individual.

The general review of the documents available in this sector reveals these documents are concentrated more on the holistic issues of water supply, health and environment in Nepal than on this issues at the micro revel. The present study has considered in depth study of the peoples participatory project of Rukum district supported by NEWAH. This will definitely provide a lot of insights in the field safe drinking water supply, sanitation project to improve rural health and environment in the rural areas of Nepal.

2.4. Planned Development and Budget Allocation

As per need for development planning in the less development countries, Nepal has also started to allocate the planning objectives and strategies to fulfill those objectives to seek the meaningful economic development. The objective of poverty alleviation and balanced regional development implies specially in keeping in view for the welfare of unprivileged groups of the country. This is the reason for which the Ninth Plan has mentioned poverty alleviation as one of the main objectives as the five-year development plan of the country. It has prepared a program for alleviating poverty with the concept of twenty year prospective plan, which to formulate a clear and about the living standard of the poor community effectively. The plan has made an outlay of Rs.189.58 billion, out of which social services are getting the highest share of 33.3%, followed by agriculture irrigation and forestry 27.05%, electricity gas and water 18.7%, transport and communication 17.59%, trade hotel and restaurant 1.54%, industry 0.84% fiancé and estate 0.13% and miscellanies 0.85% (NPC, Ninth Plan).

To provide safe drinking water and sanitation and to control water born diseases, various efforts were made by the government sectors as well as by private sectors at beginning of the planned development. Among them, public participation

did not get the main focus until the Seventh Plan. The government gave an importance to optimum mobilization of non-governmental sector; private sector and public participation only form the Eight Plan.

But in beginning success could not be achieved and only 61% of the total population got an access of drinking water at the end of this plan period. Among them 77%of the people of rural area and 56% of the urban areas were affected during this plan period. (NPC, Ninth Plan)

Ninth Plan also has given an emphasis on delivering safe drinking water and sanitation facility to all the people of the kingdom. 7,850 thousand additional people of rural and 1,850 thousand additional people of the urban areas are targeted to benefit from water and sanitation facility.

Table: - 1 Budget Allocation to the Water Supply and Sanitation Sector.

(Rs. in million)

Plan Period	All sector	Water and sanitation sector	%Share only in water and sanitation (Rs. in million)
Third Plan	2,101	31	1.5
Fourth Plan	5,048	92	1.8
Fifth Plan	10,985	437	4.0
Sixth Plan	21,750	1000	4.6
Seventh Plan	29,000	989	3.4
Eight Plan	87,080	5258	6.04
Ninth Plan	18,985	1190.20	6.28
Tenth Plan	60,982.3	2922.08	4.79

Source: National Planning Commission, 2005

From Third Five Year Plan the constitution of drinking water was also extended to rural areas of Nepal during the past 10-15 years. Approximately 2000 various government and agencies up to the end of 1990 have implemented rural and urban pipe water supply projects. The table shows the government had been increasing budget in water supply and sanitation sector.

CHAPTER- III
RESEARCH METHODOLOGY

3.1. Selection of Study Area

The main objective of this chapter is to throw light on the methodology used in present study. The purpose of the study is basically to explore the problems, impacts of safe drinking water supply and sanitation and changes overall impacts delivered by the project of Shova VDC. The study area is Shova VDC of Rukum District of Mid-western region of Nepal. This VDC has been selected for the study to understand the purpose of the safe drinking water supply and sanitation and its impacts of rural community health of rural areas people and environment lunched by NEWAH in coordination with Local NGO Sirjanshil Yuba Samaj and HMG/N. So the village or VDC is purposively selected to find out the impact and sanitation of safe drinking water supply and sanitation on rural community health and environment.

3.2. Case Study

The present study is a case study and attempt to look in to the actual state of affairs of impact of safe drinking water and sanitation on rural community health and environment of the rural areas' people. Which is located in Shova VDC of Rukum District, and they're by reach to conclusion and suggestion by generalization. According to Good and Hatt, " Case study is mode of organization data in terms of some chosen unit, such as individual life history, the history of group or some delimited social process". In order to obtain such holistic data, one may use all technique, which any other mode of organization uses; intensive interviews, questionnaire, observations, self-histories and documents case reports by others etc.

Jarry and Jarry have defined case study as the, "Study of a single instance of a phenomenon, either for its own sake or as an exemplar or paradigm case of general phenomenon perhaps as a test of a general proposition".

Since the phenomenon under consideration in this study is an exemplar case of a general phenomenon regarding the water supply schemes throughout Nepal. The

case study methods, with its advantages, in an appropriate approach to understand the issue at hand more profoundly.

3.3. Research Design

The present study is based on exploratory as well as descriptive research design. Because it describes the safe drinking water supply and sanitation situation of the study area and secondly it explores the impacts of impacts of safe drinking water supply and sanitation on rural community health and environment scheme in the rural people.

3.4. Nature of Data and Sources

Data used in this study are two types; Primary and Secondary. Primary data is collected from developing a set of questionnaire and testing among the user's group (field survey) to know the present status and peoples' view an impact of safe drinking water and sanitation on rural community health and environment sector. And the secondary date are collected from books, research reports different offices such as NEWAH Sirjanshil Youth Samaj, DWSS, DDC VDC etc. The data were collected both sources; primary and secondary sources the field and publications respectively.

3.5. Universe And Sampling

The total population of the Shova VDC is 5,970 out of which 2,996 males and 2,974 are females and the total households are 1,135 (Population of Nepal; Village Development Committees/ Municipalities, Population Census 2001). The five villages (Gaons) of Shova VDC word No. 3 of Rukum District were selected for the present research on the basic of random and purposive sampling. This VDC is selected because the safe rural drinking water and sanitation project is successfully lunched but no one researched on impact of rural community health and environment of safe drinking water and sanitation.

In the study area the sample population is 375 with 70 households of word No. 3 of the VDC. The study area is selected because the safe drinking water and sanitation and its impact on rural community health and environment project was implemented in

the Shova VDC for the supply safe drinking water and sanitation facility by rural water supply and sanitation project. So to find out the situation of safe drinking water supply and sanitation facility and its impact on the rural community health and environment of rural area or villages. The villages (Gaons) were purposively and randomly selected. The sample size for this study was 33% from the total households from each sample household; the head of the household was identified and approached for detailed information. Such from each village 20 respondents were selected as sample for the present study. The total number of sampled population was 100, which is 26.66% of the total sample population.

3.6. Technique of Data Collection

This study basically based on primary sources of data. So it is mainly based a qualitative data. In the present study following techniques were employed to collect the necessary information.

a) Structured and open-ended questionnaire: In this study structured and opened questionnaire were used to obtain information about various aspect of safe drinking water and sanitation and its impact on rural health and environment beneficiaries group.

b) Check list: Drinking the research period, a set of check list was developed to obtain the information about impact of safe drinking water and sanitation on rural community health and environment project in the villages and respondent profile.

c) Focus group discussion: In addition, focus group discussion was held with, user's group and personnel and to obtain the related information about impact of safe water supply and sanitation facility in the study are, male and female participation in construction committee and users committee, people's participations in construction of the project.

d) Field (participatory) observation: The study area visited and observed in terms of safe drinking water supply sanitation system. The observation mainly focused on impact of safe drinking water supply and sanitation

facility on the rural community health and environment. Therefore the researcher closely observed the life style of the people particularly with reject to water use household sanitation and involvement in decision making in areas such as operation and maintenance of drinking water project facility. Household sanitation is better in house supplied with safe drinking water supply system.

e) Interview schedule: Under interview schedule, two sets of questionnaire were prepared to obtain personal information and official information. The questions were about drinking supply project and its impact on rural community people's health, local environment, and people's participation, including the availability of safe drinking water supply and sanitation facilities.

3.7. Data Processing and Analysis

All the collected data by applying various techniques were put together processed and analyzed, raw data collected through completed questionnaire has tabulated and master sheet of information and various statistical tools are used to measure use of safe drinking water and sanitation and its impact on rural community health and environment. This implies both qualitative and quantitative methods of analyzed moreover to give strengths to the finding of the study especially for quantitative data various tables, percentages of data, tabulation were involved for data analyzing, processing and presentations.

CHAPTER- IV

INTRODUCTION OF THE STUDY AREA

Rukum district is one of the remote districts among other five districts in Rapti Zone of Mid-Western development region. Jumla Khalanga is the headquarter of district. Geographically it is a hilly district situated in the $28^{0}27'$ northern latitude and $82^{0}12'$ to $83^{0}9'$ eastern longitudes. It's total area is 2,877Sq.Km. Politically it is divided in to 43 VDC, 11 areas and two constituency areas. It is surrounded by six districts like Magdi and Baglung in the east, Salyan and Jajarkot in the west, Rolpa in the south and Dolpa in the north.

The district seems to be much important for its historical, natural archeological and cultural perspectives. Here are some notable things like Sisne Himal, Deurali cave, Kamal Pokhari, Sarpu Tal, Dhorpatan and Digre Jatra etc. for tourism prospective. It is known as the district of BAUNNA POKHARI and TRIPANNA TAKURI.

Chhetri, Brahaman, Magar, Newar, Dalit and Thakuri etc are the major cast/ethnicity of the district. Most of the people are farmers here. According to current census 2001A.D. The total population of district is 1,88,438 among them 95,432 are males and 93,006 are females including 33,501 households and 5.62 average household size with annual growth rate 1.88 percent. It has small plenty of flat land and very big part of hilly areas and forest areas. It is very poor in terms of infrastructure facilities like, roads, electricity, education, health facilities, safe drinking water and different types of services and facilities. Among 43 VDC, Shova VDC is one of them and situated in South part of the district. And this Shova VDC is also old DDC headquarter of the district. The district is having dualistic economic structure there are few traditional rich landlords with large size of holding while majority of the people possess small size holding development effort of the government are also very limited. The private sector is also not properly developed. All these factors are accountable for wide spread of poverty among the people living in the district. The assessment of general socio-economic status of Shova VDC has clearly depicted the status of people living in the VDCs of the district.

In Shova VDC most of the peoples are in farming occupation only few persons are in different sectors like army, police, businessman, teacher and so many others, nowadays most of the young people are going aboard country and maximum peoples are migrating because of different factors like conflict and lack of agricultural productivity.

Rukum is divided in to 43 VDCs. Of these VDCs Shova is one of them, which is the old district headquarters of Rukum District was transformed before 30 years ago. Now Shova VDC is nearly 50km. far from District Headquarter. In this VDC have 5,950 populations out of which 2,996 male and 2,974 female and 1,135 households, average household size-5.26. The climate of Shova VDC is not so different from that the Rukum district. In Shova VDC, there is mainly one river known as Sani Veri, which is a flow on the western side of the VDC. Besides this main river, there are also many other revolts or small Kholanala such as Roomgar, Chorkhola, Kudhar Khola, Thagna Khola, Ghatte Khola, Thara Khola etc. In this VDC there are three big types of community forests. Where we found very useful timbers, fire wood, wood, cattle grass etc and in these forest found Deer, Wild Boar, Jackal, Tiger, Wild Cat, and different birds like Danphe, Sparrow, Crow, Maina, Dove Kingfisher, Parrot and many others.

4.1. Distribution of Population on the Basis of Ethnic Group

There are different types of cast and ethnic groups found in Shova VDC such Brahmin, Chhetri, Magar, Thakuri etc. (See the table No.2)

Table No.: 2 Distribution of Population on the Basis of Ethnic Groups

S. No.	Ethnic group	Population	Percentage
1.	Chhetri	4033	67.55%
2.	Thakuri	960	16.08%
3.	Brahmin	528	8.79%
4.	Kami	228	2.33%
5.	Magar	117	1.95%
6.	Newar	38	0.63%
7.	Unidentified Dalit	37	0.61%
8.	Gharti/Bhujel	10	0.16%
9.	Gurung	06	0.10%
10.	Damai/Dholi	06	0.10%
11.	Others	07	0.11%
	Total	5,970	100.00%

Source: Population of Nepal VDC/Municipality Population Census 2001

In this VDC most of the people are Chhetri who are involve in different work jobs especially most of the people are involve in agricultural sector and other services like wise Thakuri are also more in the VDC who are involve in Military forces like British, India, and Nepal like other group are involve in Military forces. In this VDC other ethnic group are less then Chhetri, Thakuri and Brahmin.

4.2. Distribution of Population on the Basis of Religion

There are different religions adopted by the population in Shova VDC.(See table 3)

Table No.: 3 Distribution of Population on the Basis of Religion

S. No.	Religion	Population	Percentage
1.	Hindu	5968	99.96%
2.	Buddha	01	0.01%
3.	Islam	00	00%
4.	Kirat	00	00%
5.	Jain	00	00%
6.	Christian	01	0.01%
7.	Sikha	00	00%
8.	Bahai	00	00%
9.	Not stated	00	00%
	Total	5,970	100.00%

Source:- Source: Population of Nepal VDC/Municipality Population Census 2001

In this VDC most of population are Hindus and few Christian and few Buddha. Especially who are in the out of VDC those people are some Christian and Buddha. This table shows 99.98% people are Hindus in the study are only few people are other caste groups.

Table No.: 4 Cast Wise Distributions of the Respondents

Cast/Ethnic Group	Takura	Happla	Kami Gaon	Tahpa Goan	Senla
	No. of HHs(%)	No. of HHs(%)	No. of HHs(%)	No. of HHs(%)	No. of HHs(%)
Brahmin	1 (5%)	3 (15%)	-	2 (10%)	-
Chhetri	8 (40%)	10 (50%)	2 (10%)	10 (50%)	2 (10%)
Magar	1 (5%)	3 (15%)	2 (10%)	2 (10%)	2 (10%)
Kami	2 (10%)	1 (5%)	12 (60%)	1 (5%)	2 (10%)
Dami	2 (10%)	1 (5%)	2 (10%)	1 (5%)	10 (50%)
Sarki	1 (5%)	-	2 (10%)	-	2 (10%)
Gurung	1 (5%)	-	-	1 (5%)	1 (5%)
Thakuri	4 (20%)	2 (10%)	-	3 (15%)	1 (5%)
Total	20 (100%)	20 (100%)	20 (100%)	20 (100)	20 (100%)

Source: Field Survey, 2008

This table shows distribution of cast system in the study area. In the study area most of the people are living Magars and Kshtri. Among the various of caste group Kshtri caste group are much than other caste group in the study area.

4.3. Economic Activities of the People of the Shova VDC

The people of Shova VDC have adopted various types of occupation like agriculture, animal husbandry, services, tailoring, business, military, police, wage labors etc. Out of all these occupation they give more preference to agriculture. As Nepal is and agricultural country. So the most of the people depend on subsistence agricultural economy. They grow various types of crops like maize, wheat, paddy, barley, potato etc. Beside those they also produce different kinds of vegetables and fruits. Non-agricultural activities form a very little part of the economy. Service and related pension are the major income sources a part form agriculture. Damis, Kamis, Sarkis still have their cast specific occupation; but related income seems too little for survival. Parma (reciprocal exchange of labor), Jyaladari (daily wages), Thekka (contract) etc are prevailed and depend on the nature of job being carried out. The forest is major source of timber, fodder, cattle grass, firewood etc. Nowadays some people migrate to nearby towns of Dang Nepal Jung and other parts like Kathmandu and outside the country in foreign employment especially young male because of to increase economy status and cause of modern conflict. The male to female ration in the Village is 2,996 to 2,974.

Table No.: 5 Distribution of Drinking Water in Development Region and Rural Urban Areas

S.N.	Development Region	Rural Population		Urban Population		Total Population	
		Benefited	Percent	Benefited	Percent	Benefited	Percent
1.	Eastern D.R	2917	61%	471	70%	3388	62%
2.	Central D.R.	4251	65%	1465	85%	5716	69%
3.	Western D.R.	3216	79%	412	72%	3628	78%
4.	Mid-Western D.R.	2284	80%	168	70%	2452	79%
5	Far-Western D.R.	1719	85%	114	46%	1833	81%
	Total	14387	71%	2630	76%	17017	72%

Source: Tenth plan (page No.498)

Note: Population shows in thousand

This table shows the distribution of drinking water in development region and rural urban areas. In urban area more people are benefited supply of drinking water than rural areas.

Table No.: 6 Distribution of Household by Various Sources of Drinking Water by Place of Residence Eco-Development Region

Area	Sources of drinking water							
	Piped	Well	Tube	Spout Water	River/Stream	Others	Percent	Total households
Nepal	53.4	9.1	28.6	6.5	1.5	0.9	100	4174457
Place of Residence								
Urban	66.1	5.9	23.3	3.3	0.5	0.9	100	664507
Rural	51.1	9.7	29.6	7.0	1.7	0.9	100	3509950
Ecological Belt								
Mountain	72.7	6.3	0.0	17.2	3.5	0.4	100	28217
Hill	72.7	12.1	2.5	10.2	2.0	0.5	100	1950345
Terai	31.1	6.6	59.3	1.1	0.6	1.4	100	1938895
Development Region								
EDR	35.6	9.3	48.7	4.7	1.0	0.7	100	1001121
CDR	58.3	8.6	28.4	3.3	0.6	0.7	100	1465753
WDR	69.3	9.0	14.0	5.5	1.1	1.1	100	863045
MWDR	52.0	11.5	17.5	14.3	4.0	0.7	100	479009
FDR	47.0	7.9	23.4	16.0	3.6	2.1	100	365529

Source: Population Census, 2001

This table shows the distribution of sources of water among the households in different development regions, ecological belt and rural urban areas households. This

table shows most of water supply facility in Urban areas than Rural areas. (See Appendix-A Table No.7).

In this VDC the population depend on agriculture they have not more extra having economy only few household 84 within 1135 have own having economy activities like in manufacturing only 8, trade and business 19, transport only 1 different services 20 people engaged and earn extra income.

Table No.: 7 Household Having Agricultural Land, Livestock and Poultry for VDC

Household having								
Total	Agricultural Land only	Livestock only	Poultry only	Land and Livestock	Land and Poultry	Livestock and poultry	Land, Livestock and Poultry	None of all
1135	61	1	0	20	39	4	990	20

Source: VDC/Municipalities Population Census 2001

This table shows in the VDC most of people are self depend on especially agricultural sector they have own agricultural land.

4.4. Sanitation and Health

Defection took place outside in open spaces. Use of soap is negligible and washing of hands after defecation is not practiced in common with in houses, rooms are poorly ventilated. The yards are however comparatively cleaner with good lipne-potne (wiping with a mixture of cow dung and red mud) practice.

The VDC estimated that only about 20 percent of the household latrines with in the VDC in the year 2004. Most of them were however dirty and had no proper system. Most of the people use toilet open areas so; that makes polluted drinking water and diarrhea, cholera in the summer and breathing related complication, particularly in the winter also skin problem were related to be the major diseases. In this VDC most of people suffered from water born diseases because of the lack of knowledge, lack of safe drinking water and lack of sanitation facilities. Especially villages areas their most problem is latrine and sources of drinking water is peon like stream, small rivers, wells

etc. Sanitation condition is predominantly poor and there are almost no sanitation related facilities. The available facilities have not been utilized as well. There is a strong need to mobilize the consumers on building latrines and utilizing effectively and safe drinking water supply as well as different types of training should focus on promotional hygiene education.

CHAPTER- V

DATA ANALYSIS AND PRESENTATION

5.1. Water, Sanitation, Health and Environment

Water is vital for all form of life. In many parts of the world as well as in Nepal safe drinking water is not easily available and sanitation facilities is not available everywhere. Water is not only a vital environmental factor to all forms of life but also it plays a great role in socio-economic development, human health and environment. The use of water includes the quantities needed for drinking, bathing, washing, clothes, and foodstuff, cleaning utensils, toilet use, house cleaning and other various domestic purposes.

The first piped water supply system in Nepal dates back to 1895AD when water piped in to some areas of Kathmandu the system known as Birdhara. Though the planned period started from 1956, the greater stress on the development of rural water supply was given from the Fourth Plan onwards. The achievement was far less than ambitious target in both water supply and sanitation during the International Water Supply and Sanitation Decade but the impetus that was given for the sector development was however and encouraging development.

In 1972 a separate agency dealing exclusively with the sector alone was realized and the Department of Water Supply and Sewerage was established. Since then it has been responsible for supplying water to the rural and urban areas of Nepal. For the development of small-scale water supply projects at local level with maximum participation from the beneficiary communities the Ministry of Local Development other NGOs are involved. In order to address different environmental concerns, Government of Nepal has enunciated environment friendly policies, developed and implemented action plan and introduced environment legislations. Environment friendly provisions are included in sect oral legislation. When were enacted after 1990. However, in spite of instituting laws, policies and programmers a number of environmental challenge still prevail. Poverty, population growth rapid urbanization still impacts the resources base and cause environmental pollution. Therefore a more

concerted effort is required to curb this trend of environmental degradation and progress towards a more sustainable development country. The study area were five villages (Gaons or toles) of the project (Takura, Happla, Kami Gaon, Thapa Gaon and Senla)

5.2. Users of Project

The fresh and adequate supply of water is most essential for good health and environment with the vision of all the people of Nepal that have access to safe drinking water and sanitation facility, so many government and non-government agencies are trying to provide safe drinking water to the rural people. Up to now, only 30% people have used tap water in Nepal. In the study area there are 9 public taps distributed among the 70 households. The table shows the number of taps and number of households according to the tap number.

Table No.: 8 Number of Households According to the Number of Taps

S. No.	Tole (Gaons)	No. of taps	No. of HHs	Percent
1.	Takura	2	17	24.28%
2.	Happla	2	12	17.14%
3.	Kami Gaon (Tole)	2	14	20.00%
4.	Thapa Gaon (Tole)	2	13	18.57%
5.	Senla	1	14	20.00%
Total		9	70	

Source: Field Survey 2008

In this table shows the distribution of water supply for to drink the number of household and number of taps. In the study are the people are taking benefit from public water tap for drink and they saved extra time to do other creative activates.

5.3.Water Supply

Pure drinking water and sanitation facility are the most necessary things for healthy life and environment. In the past so many people used spring and public well for drinking water but in most rural areas people use spring, stream, river, well, etc are the source of drinking water. But, now public water supply taps and private taps are provided in the villages in a small scale by different government and non-government agencies. In the study area there were spring, river and public tap for the drinking

water in the past. But now there are water supply taps in the villages and they got many facilities form water supply project.

5.4. Satisfaction from the Project and Peoples Participation

Getting pure drinking water near the houses satisfies most of the households. They are also getting other advantages like bathing, washing clothes, use in kitchen garden to livestock's, for cleaning toilet etc. Before the lunching of the project only few households had their own toilet. After the lunching of the project there, it has promoted them to build *Kachhi* toilets. Many of them who had not their own toilet built and few others are also interested to build toilet. They are also happy sending their children school neat and clean. Most of housewives are saving time to bring drinking water. They have also taken training about the health and sanitation from saved time. So they are more aware about their health and its related problems.

Peoples' participation plays a vital role in the sustainable development of particular rural areas. Because development is for people and if the people of any area are not willing to participate in the development process, they will gain nothing. Examples should the importance of people's participation for sustainability of any development work. The people of the study are area participated in the development or supply safe drinking water and sanitation phase of project in different ways. Like labour and money, labour, sympathy etc. And many social works of governmental and non-governmental organization show that if money is not collected from the users, they won't take care of the project sufficiently. Therefore the sustainability of services, the household should collect a little amount of money them only, they are the project as their own property. In the study is also collected money for the project to make sustainable and they through their own property to supply drinking water and they had positive impact of supply safe drinking water and sanitation for the people health and environment.

5.5 Causes of Illness and Diseases from Drinking Water

Due to the less availability of fresh spring water for drinking purpose in rural areas the people used water from different sources. The river water and the water

supplied for drinking purposes are polluted in almost all cities and also some villages. Therefore, due to lack of pure or safe drinking water and sanitation, thousands of people fall sick in Nepal. In the study area, they are so many causes of illness and different diseases. Clean drinking water is quite important for human being. In Nepal, every year thousands of people ill and die due to various water born diseases and also these diseases indirectly affect the human health causing several other secondary diseases. Therefore, the pure drinking water supply plays a vital role in controlling the various diseases in the study area, the respondents experience that the water supply project helps to control the various diseases, like diarrhea, dysentery typhoid, skin diseases etc. After the availability of pure drinking water and sanitation, it has direct impact in controlling the various human diseases and be healthy environmentally.

Table No.: 9 Main Causes of Illness

Causes	No. of HHs	Percentage
Lack of drinking water	45	45%
Lack of sanitation	35	35%
Pollution	15	15%
Ghost	5	5%
Total	100	100%

Source: Field survey 2008

From the table the main causes of illness are lack of pure drinking water, sanitation and environmental pollution respectively. But after implemented project decrease all illness and water born diseases.

5.6. Health Service in Study Area

In rural areas, people still believe in Lago/Boksi etc and go to Dhami/Jhankri. When any one falls sick, the patient is sent to there, own Guruwa or Dhami/Jhankri and he/she does according to Guruwa. If the patient does not recover, then the patient is carried to the near by health center and hospital. But some literate or educated people of rural areas go to health center and hospital for direct check up. The majority people of study area are still not aware about their health. If they fall sick, they go to their Dhami/Jhankri.

Table No.: 10 Places of Getting Health Service

Types	No. of HHs	Percent
Dhami/Jhankri	31	31%
Health post	28	28%
Local clinic	26	26%
Hospital	15	15%
Total	100	100%

Source: Field survey 2008

The people of study area most of the people are going to treatment at first their own Guruwa or Dhami/Jhankri after that they go to health post, clinic, health center, hospital to do treatment.

5.7. Polluted Water and Human Health

In Nepal, we have plenty of pollution problems like air, water, soil and noise. One of the important problems of health hazards is water pollution. So, water pollution in Nepal is of great concern to the public and private agencies. But polluted water likes drinking, bathing, irrigation etc. it has direct effect on human health. In the study area majority of the respondents focus that by drinking the polluted water, it directly affects on human health and environment and they fall sick.

5.8. Human Life and Water Supply Project

Nepal is facing the problem of drinking water and sanitation; people suffering from tap water scarcity are forced to fetch drinking water from far distance. They loose their important time in search of water and they do not get enough time other works.

Table No.: 11 Impact of Water Supply Project in Human Life

Impacts	No. of HHs	Percent
Free time for other work	40	40%
Children got school clean	35	35%
Adequacy of qualitative water	15	15%
Community life is better that before	10	10%
Total	100	100%

Source: Field survey 2008

This table shows after project in study are have positive impact in human life. They have extra time to do other works and send children to school clean.

5.9. Practices of Hand Washing after Lunched Project

Many people of the rural areas are not aware very well about their health. They go to defecation near by bushes and streams and they have not practiced to use soap and ash to clean their hands. These practices also affect the environment and pollute the stream water. After lunched project in the study area most of the people are practicing to use toilet Kachhi and Pakki and clean their hands after defecation.

Table No.: 12 Hand Washing Practices After Defecation

Practices	No. of HHs	Percent
Soap and water	51	51%
Ash and water	30	30%
Soil and water	15	15%
Water only	3	3%
Not anyone	1	1%
Total	100	100%

Source: Field survey 2008

This table shows after lunched the project most of people used soap and other materials for to wash hands after defecation. They know, importance of hand wash with soap and other objectives.

5.10. Extra Water and Wastage Maintained

After lunched the water supply and sanitation project, the users have utilized the extra water in their kitchen garden, biogas plant, toilet, livestock and other domestic purposes. They have also extra time for bathing, washing clothes, cleaning vegetables, use kitchen garden and they divided the for wastage maintained. They have become neat and clean in the society, they are capable to grow different seasonal vegetables in their own kitchen garden. And after lunched project most of the rural people ware to maintained wastage. Still most of the rural people are still and aware of about their surrounding environment and they throw wastages everywhere. The streets of the villages were dirty by defecation and others. But now they are practicing to make compost fertilizer and keep the surrounding areas clean. They have take different trainings about home made wastage maintained to save environment and to make good health.

5.11. Environment Problems and Conservation

Deforestation flood, landslide and drying water sources are serous problems in Global context. Developing countries like Nepal are mostly suffered from this kind of environmental problems. The respondents of the study are also anxious about on going deforestation. They are practicing to control deforestation by participating in community forest, planting trees but they are not satisfied by deforestation. They are facing problems of floods, landslide and drying water sources. The streets of the villages are even dirty by deforestation and other activates. They have low productivity from their own agricultural land. Therefore, they are aware to preserve their surrounding environment and doing something also. Especially human activates are largely responsible for altering the ecological processes and environmental status. Human beings had been aware of the environmental issues from the earlier periods but environmental concerns got momentum recently in the developed and developing countries respectively. Therefore the environmental pollution is a matter of concern for everyone who resides on this planet. The people of the research area are practicing different activates to conserve environment.

Table No.: 13 Environmental Conservation Practices

Practices	No. of HHs	Percent
Participation in community forest	35	35%
Controlling the deforestation	22	22%
Planting the trees in own land	20	20%
Conservation of road side tree	10	10%
Clean street and road	7	7%
Manage Dhal and Nala	6	6%
Total	100	100%

Source: Field survey (group discussion) 2008

After lunched project in the study are of people are trying to clean environment by doing different activities like preservation community forest, controlling the deforestation, planting trees, clean streets and roads, management of dhal and nala or sewer etc.

5.12. Impact of Drinking Water Supply and Sanitation Project among the Villagers/ Respondents

The drinking water and sanitation project has brought many positive impacts in the community of Shova VDC. Before this project, the villagers have to suffer from many problems related to clean drinking water and sanitation. Before the project there is no proper access to safe drinking water. Before this project completion people have to depend on the open stream, khola, kuwa, well, river, etc. As the source of drinking water, which is generally not safe for drinking purpose. The sources are also far from the settlement area, so the people have to spend more time for fetching water. Due to the difficulty to fetch water mainly because of remoteness people generally consume less water in various activities such as sanitation sector, domestic household chores etc. The project has emphasized especially in the area of health and sanitation and environmental program, their initiation was found most impressive in the community. After the initiation of the scheme, project some changes, such as time saving, consumption and utilization of water can be seen in the project area. After lunched project have many positive impacts in health of respondents and environments in study area.

Table No.: 14 Impact of Water Supply in the Study Area

Description	Before Construction	After Construction
Average time to haul a trip of water	25 minutes	4 minutes
Total no. of Gagro fetched by households	1.5 Gagro	4.5 Gagro
Per capita water consumption	29.50 Liter	46.10 Liter
Water used in toilet daily	5 Liter	12 Liter
Water used in kitchen garden daily	2 Liter	10 Liter

Source: Group discussion 2008

Above table shows they have to spend average 25 minutes time to haul a trip of water before the construction of the project. But after the construction of he project, they are utilizing surplus 21 minutes time on various income generating activities such of vegetable forming, goat farming, chicken farming, cleaning, discussion about to be healthy environmentally. Environmental protection activities and other activates.

Regarding household water consumption, 1.5 Gagro water was consumed before construction and it was increased by 34 percent after the construction of the project. Similarly, per capita water consummation is also increased by 64 percent, daily water use in toilet also increased by 42 percent daily. Like wise daily water used in kitchen garden also increased by 20 percent daily.

Due to the lack of adequate clean drinking water and general awareness about the sanitation and hygiene, people had to suffer by many kinds of water and sanitation related diseases such as diarrhea, cholera, fever, skin diseases etc in the project area. But along with the initiation of this project and availability of regular and clean drinking water facility and knowledge of sanitation the researcher found considerable decrease in the diseases occurrence in the project area. (See Appendix-A 16)

The above table discloses the facts that after the completion of the scheme, the water and sanitation, related diseases have been decrease considerably. Due to the decrease in diseases, people heave not gone to the hospital. So here they are able to save the many and time which they have to use to expend in treatment of the diseases.

Before the project, generally only the female member and children used to fetch water. But after the project mean and children have also started to fetch water, thus they have started sharing some burden of their women and children. The saved time of women is used to care children, to manage house, kitchen garden and livestock and sometime to chat and take rest. The children have utilized their saved time in their study.

Availability of water near by has not only increased the bathing frequency, but has also provided to opportunity to both in cleaner and safe water, an opportunity that was not there in the past. As a result there has been a substantial decrease in the prevalence of skin diseases, likewise with the availability of clean water near by, there has been an increase in the frequency of clothes washing, men have also started washing their own clothes and this has reduced the burden of women who used to wash the clothes of men.

For many people, easy access to plentiful supply of safe water can mean a transformation in their quality of life. Being able to collect safe water suitable for drinking without along walk or wait can lead to a marked reduction in drudgery, and a major improvement on possibilities for general cleanliness. However, simply providing water does not necessarily lead to any marked improvement in general health of people. NEWAH has recognized the need for health education and sanitation as an integral component of water project over the years NEWAH developed an extensive program for health education and sanitation, which as proven very successful. Through this comprehensive program, communities have been empowered to control the incidence of diseases transmitted by faces or contaminated water. Communities have become well acquainted with the link between diseases and hygiene behavior. Thus they have realized that the behavioral change and improved personal hygiene are crucial elements for better quality of life and mainly have adopted improved hygiene and proper sanitation, practices. Now it is found in the project area that every household has latrine facility. They started to use latrine, which promote sanitation. But before the project, there were no latrine facility and people used to defecate in the open space out side the house, which, was quite difficult in rainfall and nighttime and uneasy in daytime. But now it is quite safe and easy. All the family members are now using the latrines and their personal hygiene behavior has improved. After completion of the project, to some extent it has generated the community feeling among the community members. Now they have got chance to interact with each other in the meetings and share their experiences of their daily life and find solution to the felt problems and co-operate each other. It has also promoted the gender balance in the society. And project had generated some employment opportunities for the poor family during the construction period of the project. In the present, two local poor are provided job of maintenance of water supply system. Three poor persons were selected and provided training for the regular maintenance of the water supply system. The water user committee provides them fixed salary, which is collected by user somebody provides fixed any corps per month. Their confidence has increased as a result of their position as a community worker. The employees are now able to pay for their children's fees from their earnings. It is found during the field

study that there is no any discrimination among the users in the distribution of water and sanitation facilities disregard any thing such as economic status, cast systems etc. Generally, everyone knows the importance of the clean and safe drinking water save life and unsafe/contaminated dirt water is harmful for human health., environmentally. In the present study also. The researcher tried to collect the feeling of the respondents as follows. (See Appendix-A 17).

The above table informs that most of the villages in Shova VDC of Rukum district, the respondents felt positive impact of drinking water and sanitation program in different aspects of their life. Most of the respondents inform that their life is better than before due to the availability of drinking water and sanitation facility in the villages.

5.13. Project's Help to Protect Environment

The people of the study area are not totally illiterate. Some of them are literate and few are educated. Firstly, according to the respondents, the project provides information about environment by training, VDO show etc and its affect on human health. The project helps to build toilet, to keep the kitchen garden clean, informs the users to keep tap area clean, household area to keep clean street of the village, to disposal waste in right area, use of extra water in extra activities, to save the forest and planting the trees in open space etc. Therefore by the help of project, the people are satisfied and all them participate in every work related to project and its positive impact in rural people health and environmentally supply by the safe drinking water and sanitation facilities.

5.14. Some Suggestions to the Respondents

The respondents of the study area have suggested that the following things should be done to keep the balance in safe water, sanitation, health and environment.

- Drinking water, health and environment are the complementary things, so they should be managed and preserved properly.

- Find out the source of water; establish health post and people's participation in rural sanitation should be focused.
- The polluted water causes most of the diseases, so that clean drinking water should be available easily.
- Water is life, which keeps the man healthy, but the change in environment may cause the desert of water sources. So the people should be aware about the environmental change.
- Healthy manpower is needed for the development of any Country; so pure drinking water should be providing to keep man healthy.
- Wastages should be thrown in a certain place and if some one falls ill, he/she should be taken to near by health center.

CHAPTER- VI

SUMMARY, CONCLUSION AND RECOMMENDATIONS

6.1. Summary

Nepal is a country of Natural beauty, second richest in water resources and rich cultural heritages. Nepal with 1, 47,181sq.kms. of territory has a population about 23 million, 6000 rivers and rivulets, 5000 species of vascular plants, 175 species of mammals and 850 species of birds, with highest peak of world and other many famous peaks, climate is very good not so much hot and not so much cold. Nepal is one of the peaceful Country known in the world. Water is a gift the nature and appears as spring, lake ground water, see, ocean, stream, pond, well, etc. without water no one can be alive water is one of the main causes of life and death of living beings, so water should be safe for drinking, aware about sanitation to be health environmentally. Water is more essential to human beings for drinking and other domestic purposes and other living beings. Availability of water plays a vital role in the development of a country. History shows that the civilization developed around the abundant supply of water.

The water available in nature may not be used directly for drinking purposes. In Nepal about 70-75 percent of the diseases are caused by drinking water and sanitation facility. The provisions of safe drinking water supply and sanitation facility are one of the effective measures to improve the health of people environmentally. To provide safe drinking and to control water born diseases, various efforts were made by the government as well as non-government sectors. The first piped water supply system in Nepal dates back to 1895AD, when water was brought in to some areas of Kathmandu. In 1972, a separate agency dealing exclusively with the sector alone was realized and the DWSS was established.

Man is a part of environment which is all the while beings changed by man in the course of his own development. In recent years, concern with the impact of man's action upon environment is growing rapidly. Nepal's environmental challenges cover a wide range of complex issues, which are detrimental to health. The main

environmental issues are water pollution due to poor sewerage and sanitation, industrial discharge and wastes. Most of sewages and industrial wastages are dumped in to surface water, where they pollute the water supply, poor water supply and lack of sanitation have increased diarrhea, dysentery, typhoid, skin diseases, population growth, rural-urban migration, poverty and the major leading causes of environmental degradation in Nepal. Some national and international governmental and non-governmental agencies are, involved to delivers safe drinking water and sanitation in both rural and urban areas. The most active providers of the services in the water and environmental sanitation sector are DWSS, DDC/VDC, NGOs, INGOs CBOs external support agencies and others. The NPC, MF, MHPP, NWSC, MLD, MH, MEC and MPE are responsible for their related fields. NEWAH is an organization that works through rural Nepal providing clean drinking water, sanitation and health educations.

The present study mostly focuses on the interrelation of water, health and environment of rural areas. Various books, reports and dissertations related to the dinking water, rural health and environment by the different scholars (native and foreign both) has been reviewed. Descriptive research design has been followed to describe the drinking water supply sanitation and secondly it explores the impact of drinking water supply project as exploratory research design. Data were collected through traditional methods such as structured questionnaire; check list, participation observations, informal interview etc. The data have been analyzed using descriptive method of analysis. In the study area, there are only 9 public taps distributed among the 75 households. Before the lunching of the project they were using spring, stream, river, ponds to drinking water and other domestic purposes. Most of them are satisfied now by getting pure drinking water near the houses. They have also taken training about the health and sanitation. In the different ways, they participated in the development phase of the project.

When anyone falls sick, he/she sent to their Guruwa (Dhami/Jhankri). If the patient does not recover, then the patient is carried to the nearby health post and hospital. After lunched the project most of the water born diseases controlled itself and they have extra time to do other works and send children to school clean. They are

practicing to make and use toilet and clean their hands after defection. They have utilized the extra water in their kitchen garden, biogas plant, toilet, livestock etc. After lunched project in the study area people are practicing to conserve environment and they are trying to be healthy. They are making *Kachha* and *Pakka* toilets, waste management in right area and they are making compost by wastage, planting in space area, Clean Street and they taking different training about how to keep environment clean and how to be healthy. So the research find out in the study area has positive impact of safe drinking water supply and sanitation in rural people health and environmental project.

6.2. Conclusion

Water resource is one of the major natural endowments of Nepal. Like many other countries, Nepal is also facing the problem of drinking water supply and sanitation facility. People, suffering from top water scarcity, are force to search drinking water form ponds, wells, springs, rivers, streams etc. Water from these sources is highly polluted due to waste and other man made activates.

Water is fast becoming positional commodity distributed inequitable amongst co-users falling under the same supply regime, even in Nepal that boasts of its vast water resources. Says Ismail Serageldin, WB vice chairman. "Many of the wars of the centuries were about oil, but war of the next century will over water".

The focus has been in the impact of TDWHSP on local households with reference to health and environment. By distribution of 9 public taps among 75 households, they are taking different advantages from water supply system. Most of the households participated in the development phase of the project by both doing labour and collecting money. The majority of the people is still not aware about their health and visit firstly to nearby Guruwa when they fall sick. They fell that life is better than before the project because they have extra time to do other creative works and send children to school clean. After defecation, now their hand washing with soap practice is changing. They use soap and ash. They are capable to grow seasonal

vegetables in their own kitchen garden and other domestic activates by using extra water.

They are also little aware about their surrounding environment and participate in community forest, planting trees in their own land and protect road side trees. They use forest sources to cook food sustainable and some are practicing to install biogas plant, which is an environment friendly practice. Most of the people make compost fertilizer directly and indirectly by using wastages from their houses. The project helps them to build toilet by providing subsidy, which is very effective in the study area. And after the project they know about how to be healthy environmentally. They had got many positive benefits from the safe drinking water supply and sanitation project.

But, they have some problems i.e. sometimes Lieu is seen and scare of water in summer season. They suggest to solve these problems buy checking the quality of water, using medicine, searching other sources of water and increasing number of taps.

6.3. Recommendation

Being a case study to demonstrate the impact of drinking water on rural health and environment of the people living in Shova VDC, Rukum to improve the condition of safe drinking water and sanitation in health and environment of the research area, the recommendations made here my be not be relevant to other communities of different phases.

- The people are not highly educated and most of them are unknown about their health. Therefore, the government should inform them about the interrelation of drinking water and sanitation, health and environment and also should provide school education related with it.
- The government should encourage the NGOs, INGOs, CBOs to run different development programs with promoting people's participation in this area.
- Most of the human diseases are caused by polluted water. Therefore, the government and other institutions should give knowledge to the people that the polluted water negatively impact on the human health.

- Due to the high cost in construction of the individual toilets all people such as ultra poor can not afford it so the include all, community toilet system should be promoted and they should empowered to use the toilet.
- Many people go to defecation nearby bushes and streams and they have not practiced to clean their hands by using soap and ash. Therefore, the concerning agency should promote them to use toilet by providing subsidy and knowledge.
- More refreshment programs for awareness related to water supply along with the integrated programs with it should be given to the users. The main objective of the program is to create awareness about households sanitation, personal cleanness, solid waste, disposal, method of storage and use of drinking water, contamination of drinking water collection, carriage, storage and use, knowledge about the water borne diseases, consequences of improve water and importance of safe sanitation condition. The awareness program should be focused at household level and should be conducted through poster, pamphlets, audio-visual, gathering and mass meeting.
- Most of the people still believe in the Guruwa or Dhami/Jhankri and patients sent there. The government with the help of other non-governmental organization should provide knowledge about modern medical science and give services by building health post and health center.
- On-site sanitation and waste disposal training should be given to the user to create awareness about latrine and waste management. The training regarding the benefits of the toilets, construction methods, operation and maintenance of the toiled etc. should be provided to the user members and community leaders, waste disposal component should include waste water management, surface water drainage at household level, livestock management etc.
- Up to now the people are facing tap water problems in dry season. Therefore, by investigation nearby new sources of spring water, the concern agencies should increase the number of taps in the research area.

- Hygiene and sanitation education in schools should be strengthened. Provision and management of water supply services and sanitation facilities for school in project areas have to be reviewed for improvement in contents.
- The change in environment may cause the desert of water sources. So, the government should make aware the people about the presentation of the environment by planting and saving community forests.
- After the installment of the project, no one has come to observe the project related problems from the concerned agency. Therefore, the concerned agency should go there regularly and help the people to solve the project related problems.

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Appendix-A

Tables

Table No.: 15

Household Operating Small-scale Non-Agricultural Economic Activities by Type of Activity for VDC

No. of household			Types of activity					
Total	Having economy activities	Non-having economy activities	Total	Manufacturing	Trade/Business	Transport	Service	
135	84	1051	84	8	19	1	20	

Source: VDC/Municipalities Population Census 2001

Table No.: 16

Impact of Ater Supply Among the Respondents

s	Takura			Happla			Kami Gaon			Thapa Gaon				
	Yes	No	Unk.	Yes	No	Unk.	Yes	No	Unk.	Yes	No	Unk.	Yes	
se in diarrhea	19	1	-	18	1	1	19	-	1	18	1	1	18	
se in fever	16	2	2	17	2	1	19	1	-	18	-	2	19	
se in eye diseases	12	4	4	14	3	3	17	2	1	18	1	1	16	
se in jaundice	18	1	1	17	2	1	19	-	1	16	2	2	19	
se in skin diseases	18	1	1	14	4	2	16	3	1	17	2	1	18	
ction of changes in e behaviors of family ers	18	2	2	16	3	3	14	4	2	17	3	-	16	

Source: Field survey, 2008

Table No.: 17

Impact of Water Supply in the Life of Respondents

s	Takura			Happla			Kami Gaon			Thapa Gaon			
	Yes	No	Unk.	Yes	No	Unk.	Yes	No	Unk.	Yes	No	Unk.	Yes
community is better than	20	-	-	19	-	1	20	-	-	18	1	1	19
ion of free time	20	-	-	19	1	-	18	1	1	20	-	-	17
cy of quality and quality r	19	-	1	20	-	-	19	1	-	18	1	1	20
n become able to go clean	20	-	-	20	-	-	18	1	1	20	-	-	18
feed more livestock	20	-	-	20	-	-	19	-	1	20	-	-	19
ion of time in the kitchen	18	1	1	20	-	-	17	2	1	18	1	1	18
disposal and use of toilet	20	-	-	20	-	-	19	-	1	20	-	-	18

Source: Field survey, 2008

Appendix-B
Key Informants Survey

1. Is this project still supported by any organization?
2. How do you manage the loss if it happens?
3. Do you think the project is sustainable in the long run?
4. Do you have any plan in the community becomes unable to operate the project?
5. Are you receiving any kind of support from any governmental and non-governmental organization?
6. What are the positive and negative impacts of this project?
7. What are the criteria for selecting users committee?
8. Is there any provision for any economic fund to be used for the necessary maintenance of user's taps?
9. What could be done to enhance the quality of the program and to make it more sustainable?

Thank you!!!

Appendix-C
CHECKLIST FOR KEY INFORMANTS

1. Name:- Gender:- Date:-
   Address:- Cast/Ethnic Group:-
2. Name of the village:-
3. Water user committee name:-
4. Number of households:-
5. Total population benefited:-
6. Major program of water user committee:-
7. Situation of people's participation:-
8. Number of meetings of committees and attendances of the local peoples:-
9. Problems associated with the water supply:-
10. Way to overcome the problems and improving the distribution/ supply system:-

Appendix-D
Questionnaire for the Household Survey

District:- Date:-

Name of the Respondent:- Interview No.:-

Cast:- Age:- M/F:- No. of Family member:-

VDC:- Village:- Occupation:-

1. What were the sources of water before the initiation of this project?
   a) Stream b) Kuwa c) Public tapes d) Spring e) Others
2. How much distance did you have to cover to get drinking water before this project?
   a) Less than 10 minutes b) 10-20 minutes
   c) 20-30 minutes d) More than one hour
3. Are you satisfied with the present condition of water supply?
   A) Yes B) No
   i) If yes, Why: a) Safe water b) Sufficient amount of water c) Time save d) Others
   ii) If no, Why: a) Costly b) Irregular supply c) Lack of quality d) Others
4. What type of participation did you take in the development phases of TDWHSP?
   a) Labour b) Labour and money c) Sympathy d) Others
5. Wow many hours do you get water supply per day?
   a) Less than one hours b) 5-10 hours
   c) 10-15 hours d) More than 15 hours
6. Is the distribution of water supply equal among rich and poor?
   a) Yes b) No
7. Do you collect money monthly for maintains fund?
   i) If yes, how much do you collect?
   ……
8. Are you satisfied with the change in health of your family?
   a) Yes b) No c) Unknown

9. How do most of people in this area become ill?

a) Lack of pure drinking water b) Lack of sanitation

c) Pollution d) Ghost e) Others

10. Has this project created any employment for local peoples?

a) Yes b) No

i) If yes, for how many and of what type?

……

11. Is manpower sufficient for the maintenance of the technical problems?

a) Yes b) No

12. What is the main impact of pure drinking water supply to control the diseases?

a) Prevent diarrhea b) Prevent typhoid c) Prevent skin diseases

d) Prevent dysentery e) Others

13. What kinds of health facility do your family use firstly?

a) Local witch doctor b) Local private clinic c) Health post

d) Hospital e) Others

14. What is the impact of TDWHSP?

a) Community life is better than before.

b) Free time for other useful activities.

c) Adequacy of qualitative water.

d) Children go to school clean.

e) Others

15. Do you have a toilet at you home?

a) Yes b) No

i) If yes, Kachha or Pakka

16. What do you use to clean your hands after defecation?

a) Soap and water b) Ash and water c) Soil and water

d) Only water e) Others

17. If you have extra water how are you utilizing?

a) Kitchen garden b) Animal c) Biogas d) Soak pit e) Others

18. How do you manage the wastages produced from your house?

a) Dumping in Malkhat b) Composting

c) Through in the road side d) Burning e) Others

19. What types of environment related problems does your community face?

……

20. What are you doing to preserve the environment?

a) Controlling deforestations b) Participate in community forest

c) Planting trees in own land d) Preserve the road-side trees

e) Others

21. How is TDWHSP helping to conserve environment in your community?

……

22. Do you think polluted water is harmful to human health?

……

23. Are you satisfied with the work of TDWSHP?

a) Yes b) No

i) If yes, Why?

……

ii) If no, Why?

……...

24. What kind of drinking water related problems do you still face?

a) With regard to TDWSHP …….

b) With regard drinking water general ……..

25. Do you have any comments/ suggestions regarding this project?

a) Yes b) No

i) If yes, please mention?

……..……

Thank You

Appendix-E
QUESTIONNAIRE FOR OFFICIALS

1. Name of the Respondent:
   Sex: Age: Institution:
   Education: Religion:
2. What is the main reason for starting the TDWHSP in this area?
   ……
3. What types of people's participation did you found in development phase of the RDWHSP?
   ……
4. Was there any other programs lunched by NEWAH?
   ……
5. What is the most satisfactory aspect of this project?
   ……
6. What benefits and to whom is this project providing?
   ……
7. What major problems have you faced and are you facing now?
   ……
8. What kinds of maintenance provision have been set up to run the project smoothly?
   ……
9. Does the management exist under the HWEPC handled to the local users' committee?
   ……
10. Is there any program to extend this project to other villages?
    ……
11. What types of programs for environmental protection have lunched by REWHSP?
    ……
12. What should be done to create awareness among the villagers to preserve environment?
    ……

Thank You!!